RELIABLE CUTTING TOOLS FOR EVERY MACHINE SHOP

CUTTING TOOLS

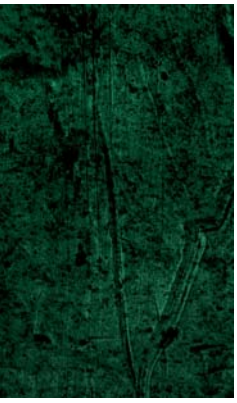
METRIC | 2022

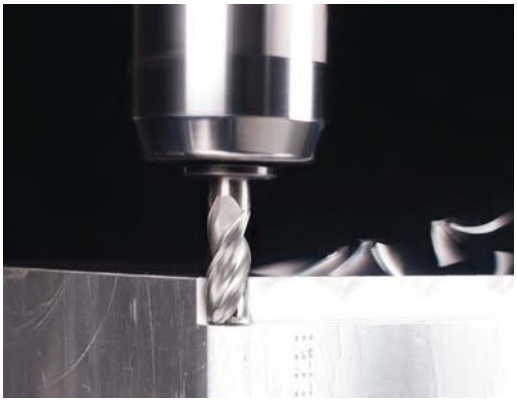
WIDIA™

HANITA™

For more than 95 years, the WIDIA™ brand has delivered high-quality milling, turning, holemaking, tapping, and systems tooling to metalcutting customers across the globe. Customers experience reliability from selection to post-delivery support through product availability, digital connectivity, and an accessible network of authorized distribution partners.

For more information regarding the WIDIA brand or products, visit **widia.com** or connect with us on Instagram, Facebook, LinkedIn, and YouTube.





WIDIA is a brand for machinists, mechanical engineers, and machine shop owners who are depending on a reliable tool to keep their shop running through the night.

The brand offers a full portfolio of standard milling, drilling, holemaking tools, technical information, and support to everyday consumers.

WIDIA tools are sold through distribution partners. Find a distributor in your area by using the distributor finder on **widia.com**.

Hanita™ solutions are developed for customers who have a passion for performance. Hanita delivers not only the tool for the job but the experience to develop a solution for the customer.

The Hanita brand offers a comprehensive range of custom and standard end mills spanning a broad range of diameters and lengths, all boasting unparalleled metal removal rates through innovative geometries.

Hanita solutions are sold primarily through WIDIA channel partners, alongside WIDIA.

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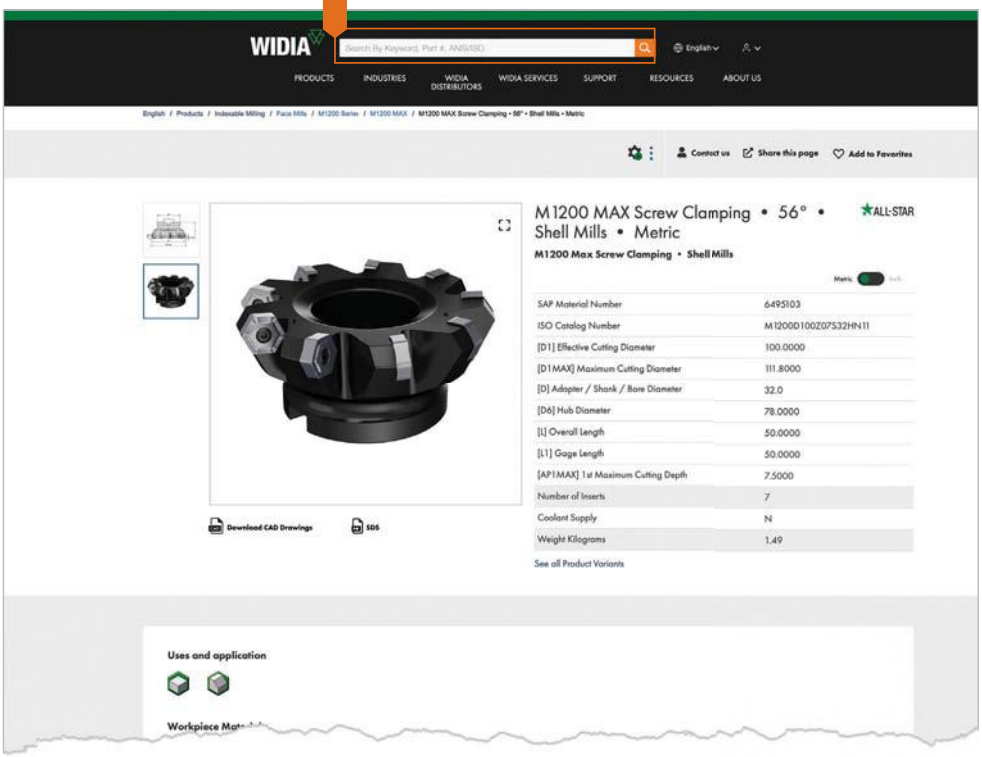
Spare Parts & Accessories Information

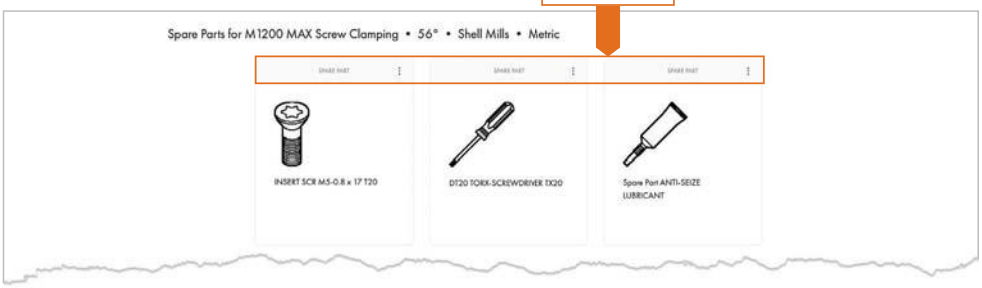
Lost a screw? Have to replace worn-out clamping wedges? Need to find and re-order those spare parts?

Are you in need of some accessories, like a torque wrench or coolant shower plate? These tools are at your fingertips!
Go to **widia.com** and find what you need in seconds. Enter the catalog number of the corresponding tool, and it will display.

STEP 1 Enter the tool catalog number here



STEP 2 Select the spare parts & accessories



WIDIA™ Digital Solutions

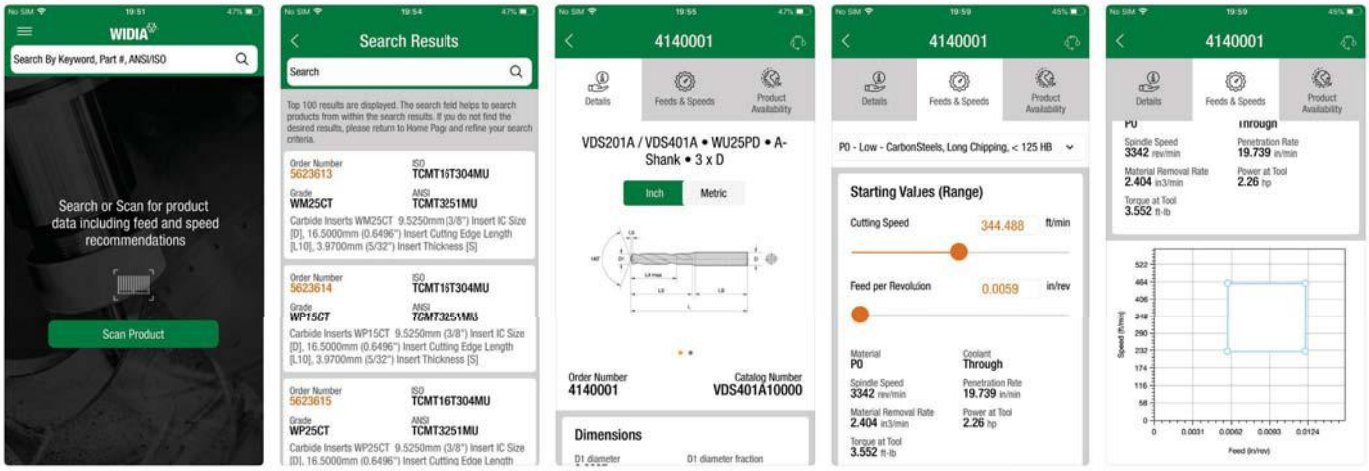
WIDIA Machining Central

WIDIA™ Machining Central Mobile App
Download for iOS or Android™:
widia.com/en/featured/WidiaMobileApp

Product Data

- Tooling Dimensional Data
- Feeds and Speeds
- Inventory Availability
- ...and More!

Tools and Resources at Your Fingertips



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WIDIA™

TO SEE ALL PRODUCT LINES, VISIT OUR DIGITAL RESOURCES

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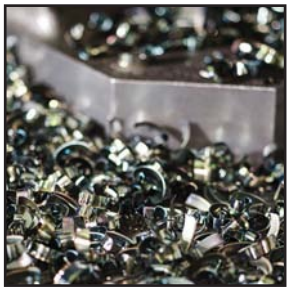
Speed

The WIDIA™ brand encompasses a variety of standard tooling designed to perform well in a range of typical machine shop operations. A team of experienced application support specialists is readily available to help increase productivity in your shop via WIDIA website chat or over the phone for every step of the way.



Simplicity

Machinists can rely on the NOVO™ machining advisor or **widia.com** to easily select the right tool for the job.

Reliability

Trust our network of authorized distributors to put WIDIA tools to work for you — in your industry, in your region, and in your business. Together we will keep your machine running through the night.

For more than 95 years, the WIDIA brand has delivered quality milling, turning, holemaking, tapping, and systems tooling to metalcutting customers across the globe. Customers experience reliability from selection to post-delivery support through product availability, digital connectivity, and an accessible network of authorized distribution partners.

Test WIDIA tooling today by selecting tools from the All-Star program. The All-Star program is comprised of proven tooling solutions that are easy to find and always available. This includes solid end mills, turning tools, drills, and taps from our most popular platforms, grades, and sizes grouped into one program and guaranteed to be in stock with same-day shipping on orders placed before 4pm CET.

Visit **widia.com** to see what products are available for same-day shipping through All-Star.

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Indexable Milling

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Choosing the Correct Cutter

Find and Select the Right Milling Cutter

1. Identify material to be machined:

   A Each tool has a material grid marked with a letter indicating the materials that can be machined.

2. Select tool based on maximum depth of cut and diameter required:

   B Information is given in this area to provide specific detail as a quick reference.

   C Informational Icons. Connection type and possible operations.

3. Select product name:

   D Navigate to introduction detail, toolbodies, inserts, and cutting data within section.

Face Milling Portfolio Overview

Face Milling	SuperFeed™	M640	M660	M1600 Mini-F	M1600	M1200 Mini
Page	A82–A83	A18–A20	A24–A27	A34–A35	A37–A38	A42–A47
Work Piece Materials	N	P M K N S H	P M K N S H	K	P M K	P M K N S H
Max. Axial Depth of Cut (Ap1 Max)	6,35mm	1,52mm	6,4/8,0mm	1,52mm	3,7mm	4,7mm
Approach/Lead Angle	90°	58°	45°	45°	43°	15/45/59°
Effective Cutting Edges	1	6	4	16	16	12
Diameter Range	25–200mm	32–125mm	20–160mm	80–160mm	50–160mm	25–125mm
Insert Style	Single-Sided	Single-Sided	Single-Sided	Double-Sided	Double-Sided	Double-Sided
Ground Insert	●	●	●	●	●	●
Pressed to Size Insert	○	●	●	○	○	●
Insert Nose Radii	0,8/2,36mm	0,90/0,98mm	Not applicable	0,8mm	1,2mm	1,2/3,2mm
Embedded Wiper Facet	1,52mm	—	1,54–2,0mm	0,6mm	0,765mm	1,454–1,6mm
Separate Wiper Insert	○	●	●	●	○	●
Cutter Pitch	fine	coarse	regular	regular	regular	coarse & fine
Workpiece Floor Finish	✓✓	✓✓	✓✓	✓✓	✓	✓✓
Screw Insert Clamping	○	●	●	●	●	●
Wedge Clamping of Inserts	●	○	○	○	○	○
Additional Operations	PCD					
Shell Mills	●	●	●	●	●	●
Screw-On End Mills	○	○	○	○	○	●
Cylindrical End Mills	● Shoulder Mill only	○	○	○	○	●
Weldon® End Mills	○	●	●	○	○	●
Cartridge for M4000	○	●	●	○	○	●

You can also use our NOVO app to guide you to the correct choice!

For more information, please visit widia.com/novo.

Determining Cutting Data

Selecting Tool Body, Insert, and Cutting Data

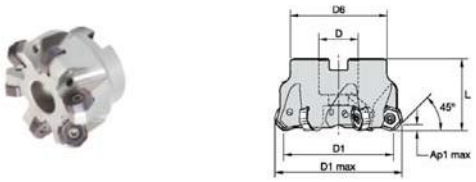
4. Choose the tool body:

Choose diameter (D1) and pitch (Z) of tool body.

NOTE: Make sure you select the correct shank style for your toolholder. For toolholders, visit widia.com.

Face Mills • M1200 Series

M1200 Mini • 45° • Shell Mills • Metric



order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3957995	M1200D040Z04HN07	40	48,7	22	38	40	3,5	4	15800	Yes	0,26
3957996	M1200D040Z05HN07	40	48,7	22	38	40	3,5	5	15800	Yes	0,26

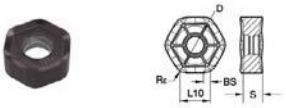
5. Choose the inserts with the WIDIA™ insert selection guide:

A Determine light machining, general purpose, or heavy machining according to workpiece material. See the Material Overview at the end of the catalog for material descriptions.

B Select the grade given in the insert selection guide. Use the six-digit order number to easily place your order.

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.E..LD	WP40PM	.E..GD	WP40PM	.E..GD	WP40PM
P3–P4	.E..LD	WP25PM	.E..GD	WS40PM	.E..GD	WS40PM
P5–P6	.E..LD	WP25PM	.E..GD	WP25PM	.E..GD	WP25PM
M1–M2	.E..LD	WP25PM	.E..GD	WP25PM	.E..GD	WP25PM
M3	.E..LD	WP40PM	.E..GD	WS30PM	.E..GD	WS30PM
K1–K2	.E..GD	TN6510	.E..GD	WK15CM	.E..GD	WK15CM
K3	.E..LD	TN6520	.E..GD	WP25PM	.E..GD	WP25PM

5A



● first choice
○ alternate choice

5B

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNPJ0704ANSNGD	12	13	6,80	4,45	1,45	1,20	0,10			3954432	3954473		3954474	5427374	5695293	5695294	5550006	5529876	5189297

6. Determine cutting data — with the WIDIA Recommended Speeds and Feeds tables:

A Choose the recommended speed value according to the workpiece material and grade.

B Choose the recommended starting feed rate according to the insert geometry and % of radial engagement ae.

Starting values are given in bold.

6A

Material Group		TN6510			TN6520			TN6525			TN6540			WK15CM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	335	**300**	275
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	50	**35**	30	–	–	–
	2	–	–	–	–	–	–	–	–	–	25	**20**	10	–	–	–
	3	–	–	–	–	–	–	–	–	–	70	**40**	30	–	–	–
	4	–	–	–	–	–	–	–	–	–	60	**30**	25	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

6A

M640 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.E..LDAL	0,13	0,34	0,47	0,10	0,25	0,34	0,07	0,18	0,25	0,06	0,16	0,22	0,06	0,15	0,20	.E..LDAL
.E..LD	0,13	0,34	0,47	0,10	0,25	0,34	0,07	0,18	0,25	0,06	0,16	0,22	0,06	0,15	0,20	.E..LD
.E..GD	0,13	0,48	0,54	0,10	0,35	0,39	0,07	0,26	0,29	0,06	0,23	0,25	0,06	0,21	0,23	.E..GD

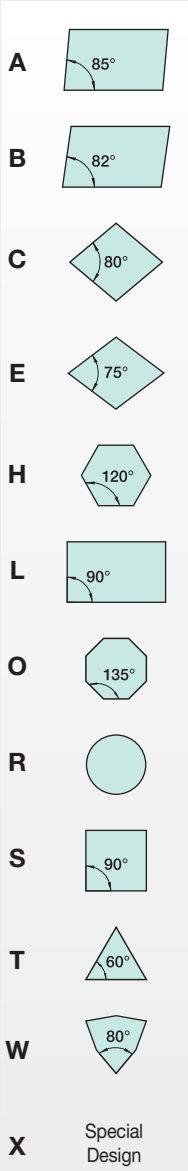
6B

NOTE: Use "Light Machining" value as starting feed rate.

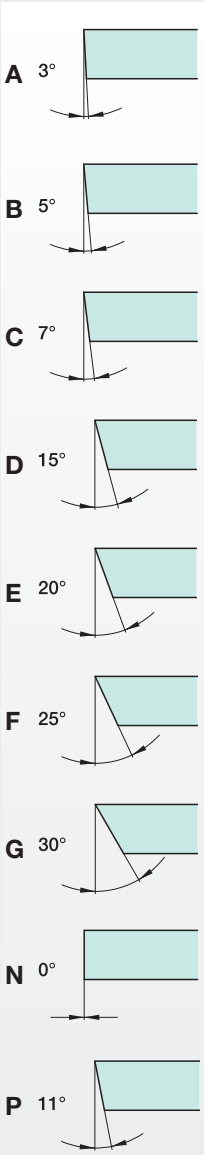
Inserts • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

H — Insert Shape



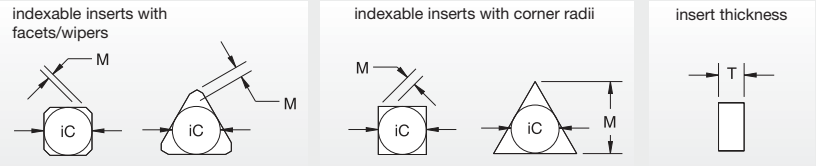
N — Insert Clearance Angle



P — Tolerance Class

J — Geometry and Clamping Type

symbol	hole	shape of hole	chipbreaker	shape of insert's section
N	without		without	
R			single-sided	
F			double-sided	
A	with	cylindrical hole	without	
M			single-sided	
G			double-sided	
W	with	partly cylindrical hole, 40–60º countersink	without	
T			single-sided	
Q	with	partly cylindrical hole, 40–60º double countersink	without	
U			double-sided	
B	with	partly cylindrical hole, 70–90º countersink	without	
H			single-sided	
C	with	partly cylindrical hole, 70–90º double countersink	without	
J			double-sided	
X	special design			



iC	tolerances on "iC" classes J, K, L, M, N (+/–)	tolerances on "iC" class U (+/–)	tolerances on "M" classes M & N (+/–)	tolerances on "M" class U (+/–)
4,76–10,00	0,051	0,076	0,076	0,127
11,11–14,29	0,076	0,127	0,127	0,203
15,00–20,64	0,102	0,178	0,152	0,279
22,00–31,16	0,127	0,254	0,178	0,381
31,75–35,00	0,152	0,254	0,2	0,381

	iC (+/–)	M (+/–)	T (+/–)		iC (+/–)	M (+/–)	T (+/–)
A	0,025	0,005	0,025	J	0,05–0,15*	0,005	0,025
B	0,025	0,005	0,013	K	0,05–0,15*	0,013	0,025
C	0,025	0,013	0,025	L	0,05–0,15*	0,025	0,025
D	0,025	0,013	0,013	M	0,05–0,15*	0,08–0,20*	0,013
E	0,025	0,025	0,025	N	0,05–0,15*	0,08–0,20*	0,025
F	0,013	0,005	0,025	P**	0,038	0,038	0,038
G	0,025	0,025	0,013	U	0,08–0,25*	0,13–0,30*	0,013
H	0,013	0,013	0,025				

**See table above for tolerances according to insert size and class.*
***WIDIA standard only.*

Inserts • Catalog Numbering System

(continued)

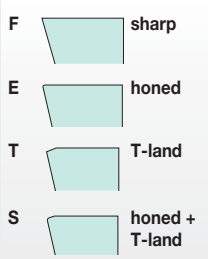
07 — Size (Cutting Edge Length)

04 — Insert Thickness

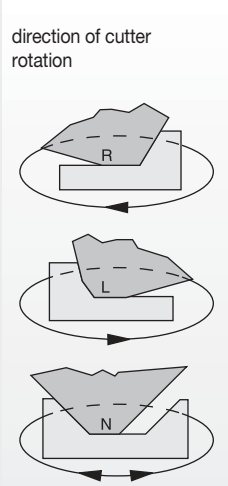
symbol	thickness
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94

AN — Corner Configuration

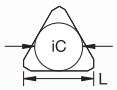
S — Cutting Edge Form



N — Insert Hand



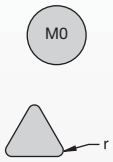
GD — Edge Geometry

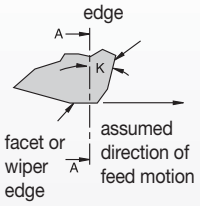


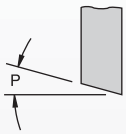
inscribed circle "iC" versus cutting edge length "L"
For shapes A, L, and X, see position #1; use length of leading cutting edge.

iC	"L" for shapes						
	S	T	R	O	C	H	E
6,00	–	–	06	–	–	–	–
6,35	06	11	06	02	06	03	06
8,00	–	–	08	–	–	–	–
9,52	09	16	09	04	09	05	09
10,00	–	–	10	–	–	–	–
12,00	–	–	12	–	–	–	–
12,70	12	22	12	05	12	07	13
15,88	15	27	15	06	16	09	16
16,00	–	–	16	–	–	–	–
19,05	19	33	19	07	19	11	19
20,00	–	–	20	–	–	–	–
25,00	–	–	25	–	–	–	–
25,40	25	4					

radius







MO	round insert
01	0,1mm
02	0,2mm
04	0,4mm
05	0,5mm
08	0,8mm
10	1,0mm
12	1,2mm
15	1,5mm
16	1,6mm
24	2,4mm
32	3,2mm

If letter is replaced by number(s), refer to table for radius "r."

lead angle K	
A	45º
D	60º
E	75º
P	90º

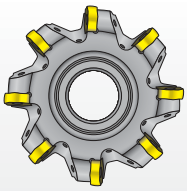
wiper edge clearance P	
A	3º
B	5º
C	7º
D	15º
E	20º
F	25º
G	30º
N	0º
P	11º

Tool Bodies • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

M1200	D	100	Z	03	C
Series	Cutting Diameter		Number of Flutes		Shank Form

Z = Number of effective flutes



C = Cylindrical

W = Weldon®

M = Modular

S = Shell Mill

Tool Bodies • Catalog Numbering System

(continued)

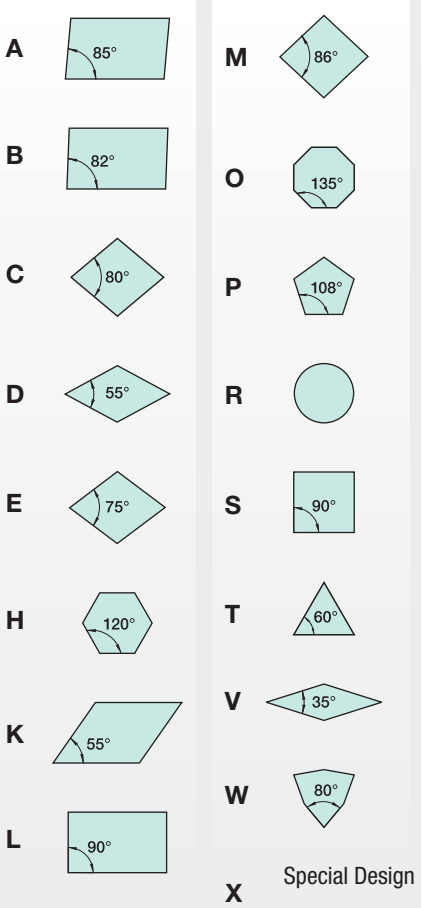
100 — Shank/Pilot Diameter

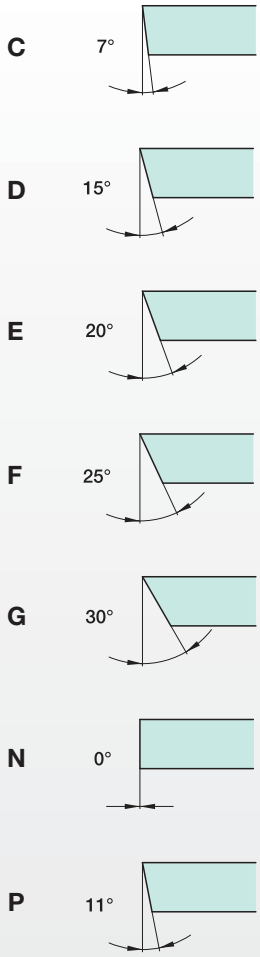
H — Insert Shape

N — Insert Clearance Angle

07 — Insert Size (Cutting Edge Length)

L **800** — Overall Length of Tool
Used for all cylindrical shank and long version Weldon® if required (standard Weldon without)

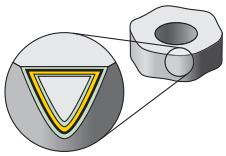




Optional uses as required

LH	Left Hand
C	Carbide Shank
HM	Heavy Metal Shank

Grades and Grade Descriptions



Modern coating technologies provide higher speed capabilities, greater productivity, and longer tool life.

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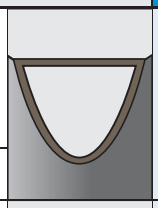
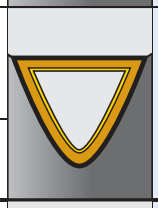
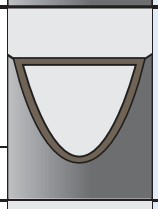
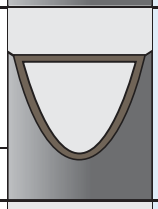
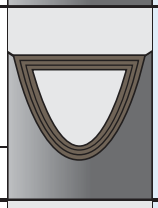
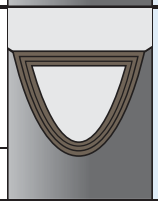
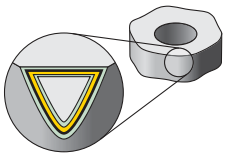
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

primary use		alternate use	
▼▼▼	Light (finishing)	∇∇∇	Light (finishing)
▼▼	Medium	∇∇	Medium
▼	Heavy (roughing)	∇	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
TN2505 HC-H05 • PVD-TiAlN		∇∇∇		▼▼▼			▼▼▼	•	
TN2510 HC-H10 • MT-CVD/CVD-TiN-TiCN-(ZrO_2-Al_2O_3-TiOx)		∇∇		▼▼			▼▼	•	
TN2525 HC-H20 • PVD-TiAlN		▼▼		∇∇			▼▼	•	
TN6501 HC-N03 • PVD-TiB_2					▼▼▼			•	•
TN6510 HC-K10 • PVD-TiAlN Nanolayer				▼▼				•	
TN6520 HC-K20 • PVD-TiAlN Nanolayer				▼▼				•	•

Grades and Grade Descriptions



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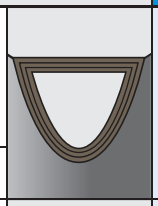
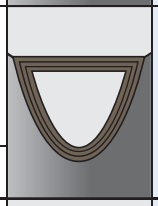
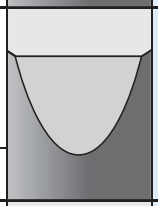
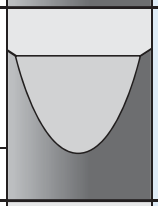
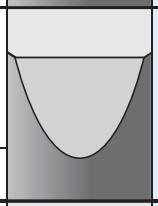
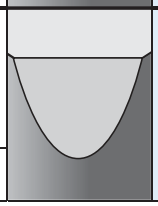
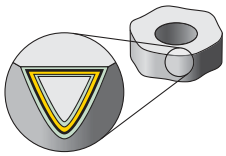
S	High-Temp Alloys
H	Hardened Materials

primary use		alternate use	
▼▼▼	Light (finishing)	∇∇∇	Light (finishing)
▼▼	Medium	∇∇	Medium
▼	Heavy (roughing)	∇	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
TN6525 HC-P25 • PVD-TiAlN Nanolayer		▼▼	∇∇	∇∇				•	
TN6540 HC-P40 • PVD-TiAlN Nanolayer		▼	▼	∇		▼▼		•	•
TTI25 HT-P15 • Cermet		▼▼▼	∇∇∇					•	•
THM HW-K15 • Uncoated				∇	▼	∇		•	•
THM-U HF-N05 • Uncoated					▼▼▼			•	•
TTM/TTM08 HW-P25 • Uncoated		▼▼	∇∇	∇∇				•	•

Grades and Grade Descriptions



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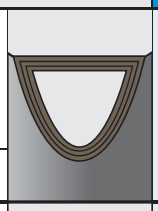
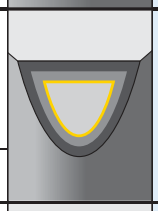
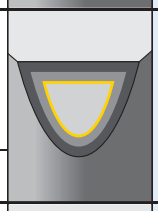
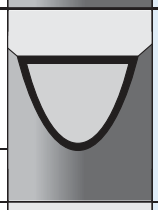
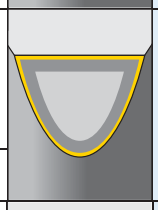
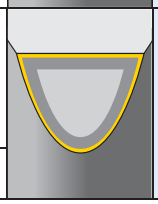
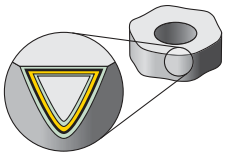
primary use		alternate use	
▼▼▼	Light (finishing)	∇∇∇	Light (finishing)
▼▼	Medium	∇∇	Medium
▼	Heavy (roughing)	∇	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
WK15PM PVD-TiAlN Nanolayer				▼▼				•	•
WK15CM™ MT-CVD/TiN-TiCN-Al_2O_3				▼▼				•	
WP20CM MT-CVD/TiN-TiCN-Al_2O_3		▼▼		∇∇					
WP25PM PVD-AlTiN Multilayer		▼▼	▼▼	∇∇		▼▼	∇∇	•	•
WS30PM™ PVD-AlTiN Multilayer		∇∇	▼▼			▼▼		•	•
WS40PM PVD-TiAlN/TiN Multilayer		∇	▼			▼		•	•

Grades and Grade Descriptions



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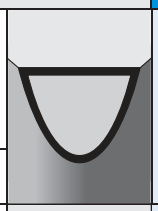
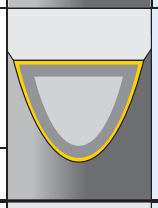
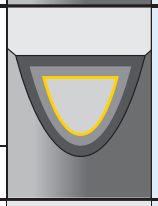
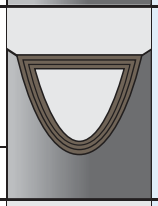
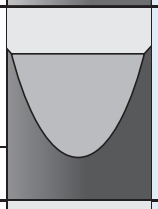
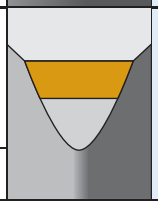
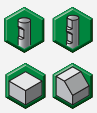
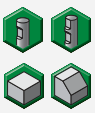
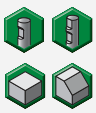
H	Hardened Materials

primary use		alternate use	
▼▼▼	Light (finishing)	∇∇∇	Light (finishing)
▼▼	Medium	∇∇	Medium
▼	Heavy (roughing)	∇	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
WU20PM PVD-TiAlN		▼▼	▼▼	∇∇		▼▼	∇∇	•	•
WU35PM PVD-AlTiN Multilayer		▼	▼			▼		•	•
WP35CM MT-CVD/TiN-TiCN-Al_2O_3		▼	∇	▼				•	
WP40PM™ PVD TiAlN-AlCrN Multilayer		▼	▼			∇		•	•
WK25YM Silicon Nitride				▼▼				•	
WDN00U™ Ultra-fine grain PCD					▼▼▼ ▼▼ ▼				•

Face Milling Portfolio Overview

Face Milling	SuperFeed™	M640	M660	M1600 Mini-F	M1600	M1200 Mini
Page	A82–A83	A18–A20	A24–A27	A34–A35	A37–A38	A42–A47
Work Piece Materials	N	P M K N S H	P M K N S H	K	P M K	P M K N S H
Max. Axial Depth of Cut (Ap1 Max)	6,35mm	1,52mm	6,4/8,0mm	1,52mm	3,7mm	4,7mm
Approach/Lead Angle	90°	58°	45°	45°	43°	15/45/59°
Effective Cutting Edges	1	6	4	16	16	12
Diameter Range	25–200mm	32–125mm	20–160mm	80–160mm	50–160mm	25–125mm
Insert Style	Single-Sided	Single-Sided	Single-Sided	Double-Sided	Double-Sided	Double-Sided
Ground Insert	◉	◉	◉	◉	◉	◉
Pressed to Size Insert	○	◉	◉	○	○	◉
Insert Nose Radii	0,8/2,36mm	0,90/0,98mm	Not applicable	0,8mm	1,2mm	1,2/3,2mm
Embedded Wiper Facet	1,52mm	—	1,54–2,0mm	0,6mm	0,765mm	1,454–1,6mm
Separate Wiper Insert	○	◉	◉	◉	○	◉
Cutter Pitch	fine	coarse	regular	regular	regular	coarse & fine
Workpiece Floor Finish	✓✓	✓✓	✓✓	✓✓	✓	✓✓
Screw Insert Clamping	○	◉	◉	◉	◉	◉
Wedge Clamping of Inserts	◉	○	○	○	○	○
Additional Operations	PCD					
Shell Mills	◉	◉	◉	◉	◉	◉
Screw-On End Mills	○	○	○	○	○	◉
Cylindrical End Mills	◉ *Shoulder Mill only*	○	○	○	○	◉
Weldon® End Mills	○	◉	◉	○	○	◉
Cartridge for M4000	○	◉	◉	○	○	◉

	M1200	M1200 Max Screw	M1200 Max Wedge	M8065HD	M8090	M8090-F	M4070	M4000
	A49–A54	A56–A57	A56–A57	A62–A63	A68–A69	A71–A72	A76–A77	A88
	P M K N S H	P M K	K	P M K S	K	K	P K	—
	6mm	7,5mm	7,5mm	9,0mm	11,5mm	1mm	17mm	—
	15/45/59°	56°	56°	64°	89°	89°	70°	—
	12	12	12	8	8	8	4	—
	50–315mm	80–250mm	63–250mm	50–315mm	63–250mm	80–250mm	125–315mm	125–315mm
	Double-Sided	Double-Sided	Double-Sided	Double-Sided	Double-Sided	Double-Sided	Double-Sided	—
	◉	○	○	○	◉	◉	◉	—
	◉	◉	◉	◉	○	○	○	—
	1,2/4,34mm	Not applicable	Not applicable	1,2mm	1,2mm	1,2mm	1,2mm	—
	1,8mm	1,2mm	1,2mm	2,37mm	—	—	—	—
	◉	○	○	○	○	◉	○	—
	coarse & fine	regular	regular	regular	coarse & fine	regular	regular	—
	✓✓	✓	✓	✓	✓	✓✓	✓	✓✓
	◉	◉	○	◉	○	○	◉	—
	○	○	◉	○	◉	○	○	—
								
	◉	◉	◉	◉	◉	◉	◉	◉
	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○
	◉	○	○	○	○	○	○	○
	◉	○	○	○	○	○	○	—

✓ Good	✓✓ Perfect	◉ Yes	○ No	★ All-Star Program

M640

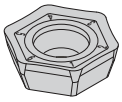
M640 Face Mill

Use the M640 face mill to create smooth finishes in all workpiece materials using soft cutting action on low-power machines.

The M640 face mill features six cutting edges on the insert with a highly positive rake enhancing productivity in finishing operations on low-power machines and driven units.

WIPER INSERT

P M K N S H



-GD

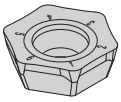
Positive and stable geometry for medium machining. The positive stabilized cutting edge improves the milling action.

-3W

Geometry with wiper facet for best surface qualities. Only to be used in conjunction with the ground geometry -GD

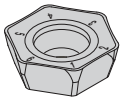
INSERT

P M K N S H



-LD

Highly positive geometry for smooth and soft cutting action. Geometry with face cutting edge for finish machining.



-AL

Geometry for machining aluminum. The main and secondary cutting edges are sharp edged.

LOW CUTTING FORCES, FINISHING OPERATIONS

PRODUCT

SERIES

M640

DIAMETER RANGE

32–125mm

SHANK TYPES

Weldon® End Mills
Shell Mills

INDUSTRY

GENERAL ENGINEERING

AEROSPACE

APPLICATIONS

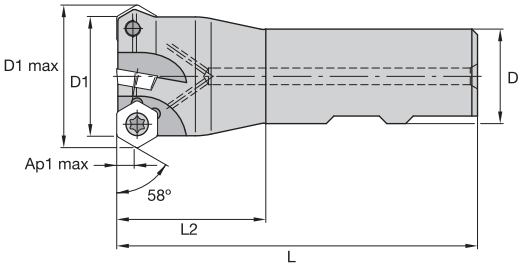
FACE MILLING

SLEEK FINISH

LOW CUTTING FORCES

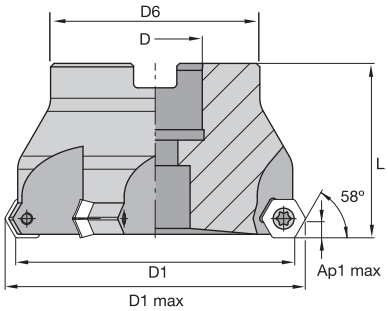
Highly positive rake angle for extremely low cutting forces.

M640 • Weldon® End Mills • Metric



order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2263165	**12395405200**	32	38,4	32	100	40	4,8	4	29500	Yes	0,35

M640 • Shell Mills • Metric

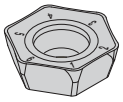


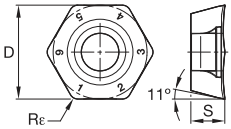
order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2263132	**12395410200**	50	56,4	22	47	40	4,8	4	19000	Yes	0,40
2263154	**12395410400**	63	69,4	22	50	40	4,8	5	15000	Yes	0,55
2263156	**12395410600**	80	86,4	27	60	50	4,8	6	11500	Yes	1,05
2263158	**12395410800**	100	106,4	32	78	50	4,8	7	9500	No	1,50
2263159	**12395415800**	100	106,4	32	78	50	4,8	10	9500	No	1,65
2263160	**12395411000**	125	131,4	40	89	63	4,8	8	7500	No	2,90

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M640 • HPGT-LDAL



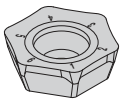


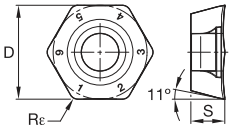
● first choice
○ alternate choice

	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	○	●
M					○	●		●	●	●	●
K	○	●	●	●	○	○	●	○			
N	●	○									○
S						●		●	○	●	●
H								○		○	

ISO catalogue number	cutting edges	D	S	Rε	hm	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPGT06T3DZFRLDAL	6	11	4,00	0,90	0,08	2288106	2288107	-	-	-	-	-	-	-	-	-

M640 • HPGT-LD



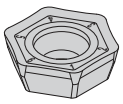


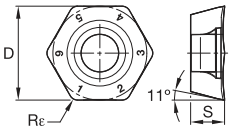
● first choice
○ alternate choice

	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	○	●
M					○	●		●	●	●	●
K	○	●	●	●	○	○	●	○			
N	●	○									○
S						●		●	○	●	●
H								○		○	

ISO catalogue number	cutting edges	D	S	Rε	hm	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPGT06T3DZERLD	6	11	3,99	0,98	0,08	-	-	-	2957585	2957547	-	-	5895784	5895785	-	6180312

M640 • HPPT-GD



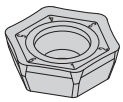


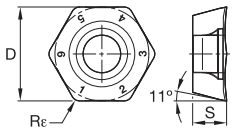
● first choice
○ alternate choice

	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	○	●
M					○	●		●	●	●	●
K	○	●	●	●	○	○	●	○			
N	●	○									○
S						●		●	○	●	●
H								○		○	

ISO catalogue number	cutting edges	D	S	Rε	hm	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPPT06T3DZENGD	6	11	3,97	0,98	0,10	-	-	-	2957583	2957586	2957552	-	5895788	5895789	-	6180315

M640 • HPGT-GD



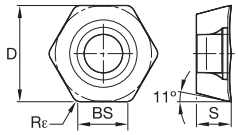


● first choice
○ alternate choice

	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	○	●
M					○	●		●	●	●	●
K	○	●	●	●	○	○	●	○			
N	●	○									○
S						●		●	○	●	●
H								○		○	

ISO catalogue number	cutting edges	D	S	Rε	hm	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPGT06T3DZENGD	6	11	3,97	0,98	0,10	-	-	2957589	-	2957588	2957546	5427387	5895782	5895783	5528978	6180313

M640 • HPGT-GD Wiper



● first choice
○ alternate choice

	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	○	●
M					○	●		●	●	●	●
K	○	●	●	●	○	○	●	○			
N	●	○									○
S						●		●	○	●	●
H								○		○	

ISO catalogue number	cutting edges	D	S	BS	Rε	hm	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPGT06T3DZERGD3W	3	11	4,00	2,88	0,98	0,10	-	-	2957549	-	2957584	-	5427388	5895786	5895787	-	6180316

M640 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.E..LD	WP40PM	.E..GD	WP40PM	.E..GD	WP40PM
P3–P4	.E..LD	WP25PM	.E..GD	WS40PM	.E..GD	WS40PM
P5–P6	.E..LD	WP25PM	.E..GD	WP25PM	.E..GD	WP25PM
M1–M2	.E..LD	WP25PM	.E..GD	WP25PM	.E..GD	WP25PM
M3	.E..LD	WP40PM	.E..GD	WS30PM	.E..GD	WS30PM
K1–K2	.E..GD	TN6510	.E..GD	WK15CM	.E..GD	WK15CM
K3	.E..LD	TN6520	.E..GD	WP25PM	.E..GD	WP25PM
N1–N2	.E..LD	WS40PM	.E..GD	WS40PM	.E..GD	WS40PM
N3	.E..LD	WS40PM	.E..GD	WS40PM	.E..GD	WS40PM

M640 • Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			WK15CM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	335	**300**	275
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	50	**35**	30	–	–	–
	2	–	–	–	–	–	–	–	–	–	25	**20**	10	–	–	–
	3	–	–	–	–	–	–	–	–	–	70	**40**	30	–	–	–
	4	–	–	–	–	–	–	–	–	–	60	**30**	25	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WP25PM			WP40PM			WS30PM			WS40PM			THM-U			THM		
P	1	395	**340**	325	355	**310**	295	–	–	–	–	–	–	–	–	–	–	–	–
	2	330	**290**	240	300	**260**	215	–	–	–	–	–	–	–	–	–	–	–	–
	3	305	**260**	210	275	**235**	190	–	–	–	–	–	–	–	–	–	–	–	–
	4	270	**220**	180	245	**205**	160	–	–	–	–	–	–	–	–	–	–	–	–
	5	220	**205**	180	205	**185**	160	–	–	–	205	**175**	145	–	–	–	–	–	–
	6	200	**150**	120	180	**140**	110	–	–	–	180	**130**	95	–	–	–	–	–	–
M	1	245	**215**	200	235	**205**	185	270	**240**	220	250	**205**	170	–	–	–	–	–	–
	2	220	**190**	155	210	**180**	150	245	**215**	175	215	**175**	145	–	–	–	–	–	–
	3	170	**145**	115	155	**140**	110	185	**160**	125	175	**130**	100	–	–	–	–	–	–
K	1	275	**245**	220	–	–	–	–	–	–	–	–	–	230	**205**	180	145	**110**	90
	2	215	**190**	180	–	–	–	–	–	–	–	–	–	–	–	–	150	**120**	85
	3	180	**160**	145	–	–	–	–	–	–	–	–	–	–	–	–	155	**115**	70
N	1	–	–	–	–	–	–	–	–	–	–	–	–	2400	**1440**	1200	1080	**720**	600
	2	–	–	–	–	–	–	–	–	–	–	–	–	1640	**980**	800	820	**560**	460
	3	–	–	–	–	–	–	–	–	–	–	–	–	960	**600**	480	540	**335**	240
S	1	50	**40**	30	50	**40**	35	55	**50**	35	50	**40**	30	–	–	–	–	–	–
	2	50	**40**	30	50	**40**	35	55	**50**	35	50	**40**	30	–	–	–	–	–	–
	3	60	**50**	30	60	**50**	35	65	**55**	35	60	**50**	30	–	–	–	–	–	–
	4	85	**60**	40	80	**60**	40	100	**70**	50	70	**60**	35	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M640 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..LDAL	0,13	0,34	0,47	0,10	0,25	0,34	0,07	0,18	0,25	0,06	0,16	0,22	0,06	0,15	0,20	.F..LDAL
.E..LD	0,13	0,34	0,47	0,10	0,25	0,34	0,07	0,18	0,25	0,06	0,16	0,22	0,06	0,15	0,20	.E..LD
.E..GD	0,13	0,48	0,54	0,10	0,35	0,39	0,07	0,26	0,29	0,06	0,23	0,25	0,06	0,21	0,23	.E..GD

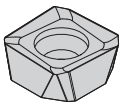
NOTE: Use "Light Machining" value as starting feed rate.

M660 Face Mill

The M660 face mill is designed with a strong tool body and perfect axial and radial runout for heavy roughing of steel and cast iron materials.

M660 face mills are equipped with thick inserts and a body design with a large chip gash to efficiently evacuate chips from heavy-duty applications.

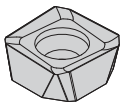
THREE CHIPBREAKERS FOR ALL HEAVY-DUTY APPLICATIONS IN STEEL AND CAST IRON



-20

P M S

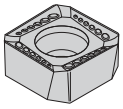
Light Machining



-21

K

General Purpose Machining



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P M K S

General Purpose and Heavy Machining

HEAVY-DUTY FACE MILLING OF STEEL AND CAST IRON

PRODUCT

SERIES

M660

DIAMETER RANGE

20–160mm

SHANK TYPES

Shell Mills
Weldon® End Mills

INDUSTRY

ENERGY

GENERAL ENGINEERING

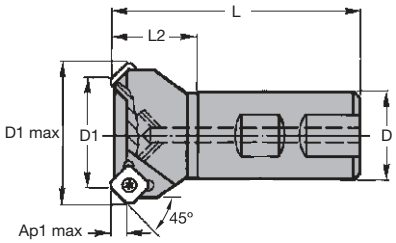
TRANSPORTATION

APPLICATIONS

FACE MILLING

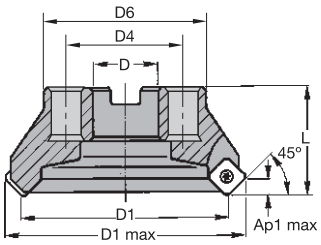
HEAVY DUTY

M660 • Weldon® Shank SN1205.. • Metric



order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2002367	12396202200	20	33,8	25	86	30	6,4	2	17000	Yes	0,30
2002370	12396202600	25	38,7	25	91	35	6,4	2	15000	Yes	0,40

M660 • Shell Mills SN1205.. • Metric

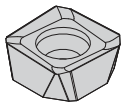


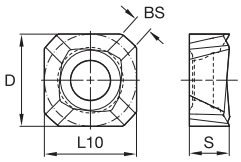
order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003541	12396203800	50	63,5	22	—	50	40	6,4	4	12500	Yes	0,45
2003558	12396204200	63	76,5	22	—	50	40	6,4	5	11000	Yes	0,60
2003575	12396204600	80	94,3	27	—	60	50	6,4	6	9900	Yes	1,15
2003582	12396205000	100	113,4	32	—	78	50	6,4	7	8900	No	1,60
2003679	12396205400	125	138,3	40	—	89	63	6,4	8	7900	No	2,80
2003780	12396205800	160	173,3	40	66,7	90	63	6,4	10	7000	No	4,10

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M660 • SNKT-20 • SN1205..



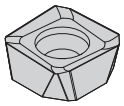


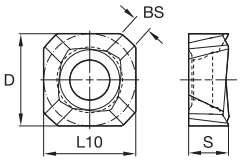
● first choice
○ alternate choice

	THM	TN6525	TN6540	TT125	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
P		●	●	●	●		●	●	●
M		○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

ISO catalogue number	cutting edges	D	L10	S	BS	hm	THM	TN6525	TN6540	TT125	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNKT1205AZER20	4	12,70	12,70	5,49	2,00	0,10	–	–	2964201	–	–	–	–	–	–
SNKT1205AZER20	4	12,70	12,70	5,49	2,00	—	–	–	–	–	–	–	–	6842099	–

M660 • SNKT-21 • SN1205..



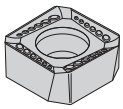


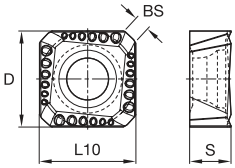
● first choice
○ alternate choice

	THM	TN6525	TN6540	TT125	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
P		●	●	●	●		●	●	●
M		○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

ISO catalogue number	cutting edges	D	L10	S	BS	hm	THM	TN6525	TN6540	TT125	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNKT1205AZR21	4	12,70	12,70	5,56	1,54	0,15	2022375	–	–	2022374	–	5427383	–	–	–
SNKT1205AZR21	4	12,70	12,70	5,56	1,54	—	–	–	–	–	–	–	–	6842100	–

M660 • SNMT-31 • SN1205..



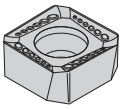


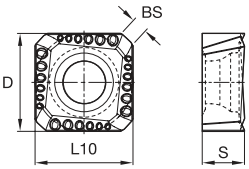
● first choice
○ alternate choice

P			●	●	●	●		●	●	●
M			○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNMT1205AZR31	4	12,70	12,70	5,56	1,54	–	0,16	-	2964206	2964204	-	2013680	5427382	5895536	5895537	5551088

M660 • SNKT-31 • SN1205..



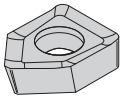


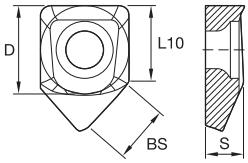
● first choice
○ alternate choice

P			●	●	●	●		●	●	●
M			○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

catalogue number	cutting edges	D	L10	S	BS	hm	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNKT1205AZR31	4	12,70	12,70	5,56	1,54	0,16	-	2964208	2964205	-	-	5427384	-	6826407	-

M660 • XNKT-11 Wiper • SN1205..





● first choice
○ alternate choice

	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
P		●	●	●	●		●	●	●
M		○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
XNKT1205AZER11	1	12,70	12,70	5,15	8,00	1,30	0,15	2015246	-	-	-	-	5427381	-	6842111	-

M660 • SN1205.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	...20	TN6540	**...31**	**WP40PM**	...31	WP40PM
P3–P4	...20	WP35CM	**...31**	**WP35CM**	...31	WP35CM
P5–P6	...20	WP35CM	**...31**	**WP35CM**	...31	WP35CM
M1–M2	...20	TN6540	**...31**	**WP25PM**	...31	WP25PM
M3	...20	WP35CM	**...31**	**WP35CM**	...31	WP35CM
K1–K2	...21	WK15CM	**...31**	**WK15CM**	...31	WK15CM
K3	...21	WK15CM	**...31**	**WP35CM**	...31	WP35CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	...20	TN6540	**...31**	**WP25PM**	...31	WP25PM
S3	–	–	**–**	**–**	–	–
S4	...20	TN6540	**...31**	**WP40PM**	...31	WP40PM
H1	–	–	**–**	**–**	–	–

M660 • SN1205.. • Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			TTM08			WP25PM			WP35CM		
P	1	410	**320**	280	360	**280**	240	230	**200**	190	395	**340**	325	455	**395**	370
	2	320	**250**	215	250	**190**	170	195	**170**	140	330	**290**	240	280	**255**	230
	3	280	**215**	185	215	**170**	140	180	**150**	125	305	**260**	210	255	**230**	205
	4	235	**170**	145	180	**130**	110	160	**130**	105	270	**220**	180	190	**175**	160
	5	310	**235**	200	240	**180**	150	–	**–**	–	220	**205**	180	260	**230**	210
	6	205	**160**	130	160	**120**	100	–	**–**	–	200	**150**	120	160	**135**	110
M	1	190	**120**	80	130	**80**	60	–	**–**	–	245	**215**	200	205	**185**	155
	2	120	**80**	50	80	**50**	40	–	**–**	–	220	**190**	155	185	**160**	140
	3	125	**80**	55	85	**50**	40	–	**–**	–	170	**145**	115	145	**130**	115
K	1	275	**245**	220	220	**205**	180	–	**–**	–	275	**245**	220	295	**265**	240
	2	215	**190**	180	175	**155**	140	–	**–**	–	215	**190**	180	235	**210**	190
	3	180	**160**	145	155	**145**	125	–	**–**	–	180	**160**	145	195	**175**	160
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	50	**35**	30	–	**–**	–	50	**40**	30	–	**–**	–
	2	–	**–**	–	25	**20**	10	–	**–**	–	50	**40**	30	–	**–**	–
	3	–	**–**	–	70	**40**	30	–	**–**	–	60	**50**	30	–	**–**	–
	4	–	**–**	–	60	**30**	25	–	**–**	–	85	**60**	40	66	**50**	33
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		WK15CM			WP40PM			TTI25			THM		
P	1	–	**–**	–	355	**310**	295	430	**360**	300	–	**–**	–
	2	–	**–**	–	300	**260**	215	310	**250**	215	–	**–**	–
	3	–	**–**	–	275	**235**	190	310	**250**	215	–	**–**	–
	4	–	**–**	–	245	**205**	160	265	**215**	180	–	**–**	–
	5	–	**–**	–	205	**185**	160	320	**235**	200	–	**–**	–
	6	–	**–**	–	180	**140**	110	145	**110**	90	–	**–**	–
M	1	–	**–**	–	235	**205**	185	480	**310**	215	–	**–**	–
	2	–	**–**	–	210	**180**	150	325	**205**	145	–	**–**	–
	3	–	**–**	–	155	**140**	110	320	**210**	145	–	**–**	–
K	1	505	**460**	410	–	**–**	–	220	**185**	155	145	**110**	90
	2	400	**355**	330	–	**–**	–	180	**145**	125	150	**120**	85
	3	335	**300**	275	–	**–**	–	145	**125**	100	155	**115**	70
N	1	–	**–**	–	–	**–**	–	–	**–**	–	1080	**720**	600
	2	–	**–**	–	–	**–**	–	–	**–**	–	820	**560**	460
	3	–	**–**	–	–	**–**	–	–	**–**	–	540	**335**	240
S	1	–	**–**	–	50	**40**	35	–	**–**	–	–	**–**	–
	2	–	**–**	–	50	**40**	35	–	**–**	–	–	**–**	–
	3	–	**–**	–	60	**50**	35	–	**–**	–	–	**–**	–
	4	–	**–**	–	80	**60**	40	–	**–**	–	–	**–**	–
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

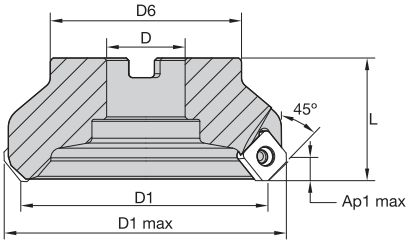
M660 • SN1205.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...20	0,17	0,66	1,19	0,12	0,47	0,86	0,09	0,35	0,64	0,08	0,31	0,56	0,07	0,28	0,51	...20
...21	0,24	0,74	1,25	0,18	0,53	0,89	0,13	0,40	0,66	0,12	0,35	0,58	0,11	0,32	0,53	...21
...31	0,26	0,76	1,28	0,19	0,55	0,91	0,14	0,41	0,68	0,12	0,36	0,59	0,11	0,33	0,54	...31

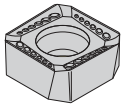
NOTE: Use "Light Machining" value as starting feed rate.

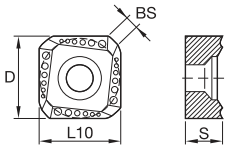
M660 • Shell Mills SN1505..



order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003593	**12396215000**	100	116,9	32	78	50	8,0	7	8900	No	1,60

M660 • SNMT-31 • SN1505..



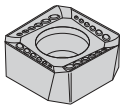


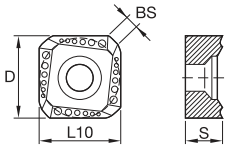
● first choice
○ alternate choice

	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
P		●	●	●	●		●	●	●
M		○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

catalogue number	cutting edges	D	L10	S	BS	hm	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNMT1505AZR31	4	16	15,88	5,56	2,00	0,16	I	I	I	I	I	5427386	I	I	I
SNMT1505AZR31	4	16	15,88	5,56	—	0,16	I	I	I	I	I	I	I	6901873	I

M660 • SNKT-31 • SN1505..





● first choice
○ alternate choice

	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
P		●	●	●	●		●	●	●
M		○	●	○			●	●	●
K	○	○	○	○		●	○	○	
N	●								
S			●				●	○	○
H							○		

ISO catalogue number	cutting edges	D	L10	S	BS	hm	THM	TN6525	TN6540	TTI25	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNKT1505AZR31	4	15,88	15,88	5,56	2,00	0,16	I	I	I	I	I	5427385	I	6843998	5895540

M660 • SN1505.. • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	...31	WP40PM	**...31**	**WP40PM**	...31	WP40PM
P3–P4	...31	WP25PM	**...31**	**WP35CM**	...31	WP35CM
P5–P6	...31	WP25PM	**...31**	**WP35CM**	...31	WP35CM
M1–M2	...31	WP25PM	**...31**	**WP25PM**	...31	WP25PM
M3	...31	WP35CM	**...31**	**WP35CM**	...31	WP35CM
K1–K2	...31	WK15CM	**...31**	**WK15CM**	...31	WK15CM
K3	...31	WK15CM	**...31**	**WK35CM**	...31	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	...31	WP25PM	**...31**	**WP25PM**	...31	WP25PM
S3	–	–	**–**	**–**	–	–
S4	...31	WP40PM	**...31**	**WP40PM**	...31	WP40PM
H1	–	–	**–**	**–**	–	–

M660 • SN1505.. • Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			WP25PM			WP35CM		
P	1	410	**320**	280	360	**280**	240	395	**340**	325	455	**395**	370
	2	320	**250**	215	250	**190**	170	330	**290**	240	280	**255**	230
	3	280	**215**	185	215	**170**	140	305	**260**	210	255	**230**	205
	4	235	**170**	145	180	**130**	110	270	**220**	180	190	**175**	160
	5	310	**235**	200	240	**180**	150	220	**205**	180	260	**230**	210
	6	205	**160**	130	160	**120**	100	200	**150**	120	160	**135**	110
M	1	190	**120**	80	130	**80**	60	245	**215**	200	205	**185**	155
	2	120	**80**	50	80	**50**	40	220	**190**	155	185	**160**	140
	3	125	**80**	55	85	**50**	40	170	**145**	115	145	**130**	115
K	1	275	**245**	220	220	**205**	180	275	**245**	220	295	**265**	240
	2	215	**190**	180	175	**155**	140	215	**190**	180	235	**210**	190
	3	180	**160**	145	155	**145**	125	180	**160**	145	195	**175**	160
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	50	**35**	30	50	**40**	30	–	**–**	–
	2	–	**–**	–	25	**20**	10	50	**40**	30	–	**–**	–
	3	–	**–**	–	70	**40**	30	60	**50**	30	–	**–**	–
	4	–	**–**	–	60	**30**	25	85	**60**	40	66	**50**	33
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		WK15CM			WP40PM			TTI25			THM		
P	1	–	**–**	–	355	**310**	295	430	**360**	300	–	**–**	–
	2	–	**–**	–	300	**260**	215	310	**250**	215	–	**–**	–
	3	–	**–**	–	275	**235**	190	310	**250**	215	–	**–**	–
	4	–	**–**	–	245	**205**	160	265	**215**	180	–	**–**	–
	5	–	**–**	–	205	**185**	160	320	**235**	200	–	**–**	–
	6	–	**–**	–	180	**140**	110	145	**110**	90	–	**–**	–
M	1	–	**–**	–	235	**205**	185	480	**310**	215	–	**–**	–
	2	–	**–**	–	210	**180**	150	325	**205**	145	–	**–**	–
	3	–	**–**	–	155	**140**	110	320	**210**	145	–	**–**	–
K	1	505	**460**	410	–	**–**	–	220	**185**	155	145	**110**	90
	2	400	**355**	330	–	**–**	–	180	**145**	125	150	**120**	85
	3	335	**300**	275	–	**–**	–	145	**125**	100	155	**115**	70
N	1	–	**–**	–	–	**–**	–	–	**–**	–	1080	**720**	600
	2	–	**–**	–	–	**–**	–	–	**–**	–	820	**560**	460
	3	–	**–**	–	–	**–**	–	–	**–**	–	540	**335**	240
S	1	–	**–**	–	50	**40**	35	–	**–**	–	–	**–**	–
	2	–	**–**	–	50	**40**	35	–	**–**	–	–	**–**	–
	3	–	**–**	–	60	**50**	35	–	**–**	–	–	**–**	–
	4	–	**–**	–	80	**60**	40	–	**–**	–	–	**–**	–
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M660 • SN1505.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...31	0,33	0,84	1,35	0,24	0,60	0,97	0,18	0,45	0,72	0,16	0,39	0,63	0,14	0,36	0,57	...31

NOTE: Use "Light Machining" value as starting feed rate.

M1600 Series

M1600, M1600 Mini-F Face Mills

The M1600 Series includes versatile, 16-edged face mills for roughing, semi-finishing, and finishing of steel, cast iron, and nodular iron materials that will run in low-power machines, unstable and non-rigid set-ups, and long overhang conditions.

M1600 MINI-F

The M1600 Mini-F face mill is a finishing solution with an Ap max of 2,1mm to achieve surface finish below Ra 1,6.

M1600

The M1600 standard sized face mill is a reliable semi-finishing and roughing tool with an Ap max of 3,7mm and lead angle of 43 degrees.

M1600 MINI-F INSERTS

SEMI-FINISH INSERTS

WK15CM

K

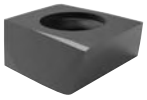
WU10PM

K H

WU20PM

P M K N S H

WIPER INSERTS



THM-F

K N

WU10PM

K H

M1600 INSERTS

-MM

WK15CM

K

WK15CM is a wear-resistant grade with balanced toughness for general milling of cast irons. Best results in dry machining, but can also be used wet.

WP35CM

P K

WP35CM has a wide range of applications in general and rough milling of steels and cast iron. Performs best in dry, but can also be used under wet conditions.

WU20PM

P M K N S H

WU20PM is a universal grade for machining of steel, stainless steel, and high-temperature alloys. Also suitable for machining of gray and nodular irons. Resists breakage and offers improved wear resistance and increased strength. Can be used for both dry and wet machining.

VERSATILE FACE MILL FOR ALL MACHINE CONDITIONS

PRODUCT		INSERTS		
SERIES	DIAMETER RANGE	INSERT TYPE	GRADE	MATERIALS
M1600 MINI-F	80–160mm	MM, Wiper	WK15CM, WU10PM, WU20PM Wiper: THM-F, WU10PM	K
M1600	50–160mm	MM	WK15CM, WP35CM, WU20PM	P M K N S H

APPLICATIONS

FACE MILLING

INDUSTRY

TRANSPORTATION

AEROSPACE

ENERGY

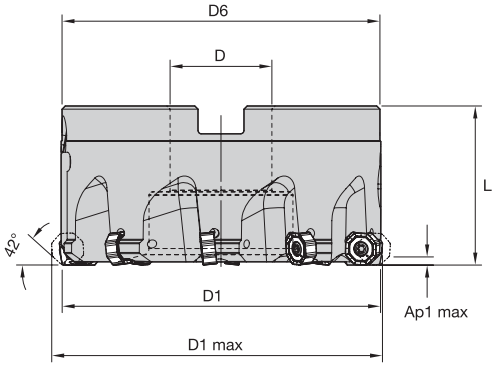
GENERAL ENGINEERING

43º

LEAD ANGLE

redistributes cutting forces in the spindle z-axis direction.

M1600 Mini-F • 42° • Shell Mills • Metric

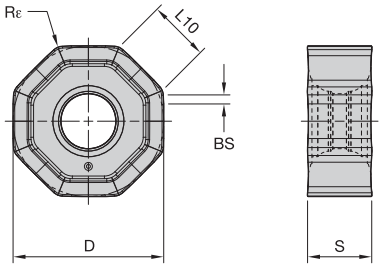


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5626416	**M1600D080Z08W2S27ON04**	80	86,4	27	80	50	2,1	8	—	No	1,56
5626417	**M1600D100Z10W2S32ON04**	100	106,4	32	100	50	2,1	10	—	No	4,79
5546056	**M1600D125Z12W3S40ON04**	125	131,4	40	89	63	2,1	12	—	No	8,39
5626418	**M1600D160Z16W4S40ON04**	160	166,4	40	90	63	2,1	16	5700	No	6,40

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1600 Mini-F • ONGX-MM

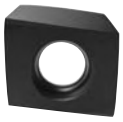


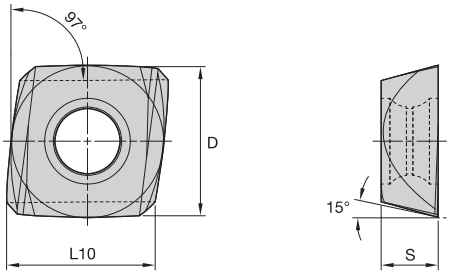
● first choice
○ alternate choice

P				●
M				●
K	●	●	●	○
N	●			○
S				○
H			●	○

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-F	WK15CM	WU10PM	WU20PM
ONGX04T308ANSNMM	16	10	4,10	3,97	0,60	0,80	0,04	–	6095310	6243772	–
ONGX04T308ANSNMM	16	10	4,10	3,97	0,60	0,80	0,05	–	–	–	6291724

M1600 Mini-F • Wiper Inserts • XDHX-W2C





● first choice
○ alternate choice

P				●
M				●
K	●	●	●	○
N	●			○
S				○
H			●	○

ISO catalogue number	cutting edges	D	L10	S	Rε	hm	THM-F	WK15CM	WU10PM	WU20PM
XDHX1004RW2C	2	13	8,72	4,76	0,00	0,02	6739214	–	–	–
XDHX1004RW2C	2	13	–	4,76	–	0,02	–	–	6877620	–

M1600 Mini-F • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MM	WU10PM	**.S..MM**	**WU10PM**	.S..MM	WU20PM
P3–P4	.S..MM	WU10PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
P5–P6	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
M1–M2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
M3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
K1–K2	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MM	WU20PM
K3	.S..MM	WU20PM	**.S..MM**	**WU10PM**	.S..MM	WK15CM
N1–N2	.S..MM	WU10PM	**.S..MM**	**WU10PM**	.S..MM	WU20PM
N3	.S..MM	WU10PM	**.S..MM**	**WU10PM**	.S..MM	WU20PM
S1–S2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S4	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
H1	.S..MM	WU10PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM

M1600 Mini-F • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WU10PM			WU20PM			THM-F		
P	1	–	**–**	–	–	**–**	–	330	**290**	270	–	**–**	–
	2	–	**–**	–	–	**–**	–	275	**250**	200	–	**–**	–
	3	–	**–**	–	–	**–**	–	255	**220**	175	–	**–**	–
	4	–	**–**	–	245	**200**	170	225	**190**	150	–	**–**	–
	5	–	**–**	–	–	**–**	–	185	**175**	150	–	**–**	–
	6	–	**–**	–	–	**–**	–	165	**130**	100	–	**–**	–
M	1	–	**–**	–	–	**–**	–	205	**180**	165	–	**–**	–
	2	–	**–**	–	–	**–**	–	185	**160**	130	–	**–**	–
	3	–	**–**	–	–	**–**	–	140	**120**	95	–	**–**	–
K	1	420	**385**	340	295	**265**	240	250	**220**	185	190	**170**	150
	2	335	**295**	275	230	**205**	190	200	**180**	150	–	**–**	–
	3	280	**250**	230	195	**175**	160	180	**150**	120	–	**–**	–
N	1	–	**–**	–	640	**570**	525	550	**470**	400	795	**695**	600
	2	–	**–**	–	640	**570**	525	550	**470**	400	795	**695**	600
	3	–	**–**	–	580	**535**	490	400	**350**	300	–	**–**	–
S	1	–	**–**	–	–	**–**	–	40	**35**	25	–	**–**	–
	2	–	**–**	–	–	**–**	–	40	**35**	25	–	**–**	–
	3	–	**–**	–	–	**–**	–	50	**40**	25	–	**–**	–
	4	–	**–**	–	–	**–**	–	70	**50**	35	–	**–**	–
H	1	–	**–**	–	160	**130**	90	110	**80**	70	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M1600 Mini-F • Recommended Starting Feeds [mm]

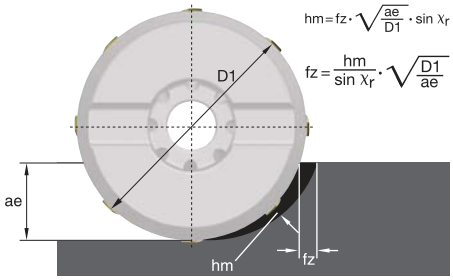
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,17	**0,61**	1,23	0,12	**0,44**	0,88	0,09	**0,33**	0,66	0,08	**0,29**	0,57	0,07	**0,26**	0,52	.S..MM

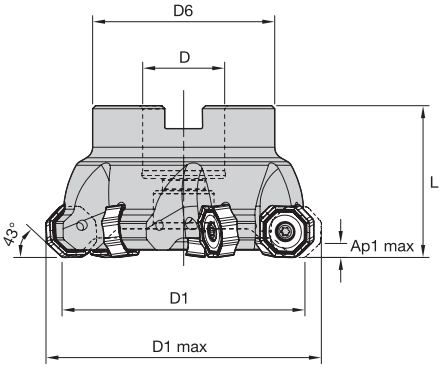
*NOTE: First choice starting feed (fz) is in **bold** type.*
Use corresponding speed (vc).
fz and vc are valid for ae ≥0,4 D1.
For smaller ae, fz and vc should be multiplied by the factor given below:

$$hm = fz \cdot \sqrt{\frac{ae}{D1}} \cdot \sin \chi_r$$

$$fz = \frac{hm}{\sin \chi_r} \cdot \sqrt{\frac{D1}{ae}}$$

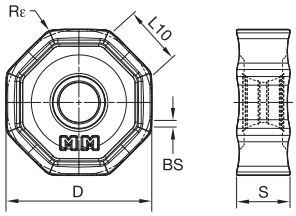


M1600 • 43° • Shell Mills • Metric



order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4002796	M1600D050Z04S22ON06	50	60,7	22	40	40	3,7	4	—	Yes	0,28
4002797	M1600D063Z05S22ON06	63	73,7	22	40	40	3,7	5	—	Yes	0,43
3837977	M1600D080Z07S27ON06	80	90,7	27	60	50	3,7	7	—	Yes	0,97
3860336	M1600D100Z09S32ON06	100	110,7	32	78	50	3,7	9	—	Yes	1,52
3837978	M1600D125Z11S40ON06	125	135,7	40	89	63	3,7	11	6900	Yes	2,70
4002798	M1600D160Z13S40ON06	160	170,7	40	90	63	3,7	13	—	Yes	3,83

M1600 • ONGX-MM • General Purpose Face Milling



● first choice
○ alternate choice

P		●	●
M		●	●
K	●	○	○
N			○
S		○	○
H			○

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP35CM	WU20PM
ONGX060512ANSNMM	16	17	6,87	5,47	0,77	1,20	0,04	6072424	-	-
ONGX060512ANSNMM	16	17	6,87	5,47	0,77	1,20	0,06	-	6852431	3778942

M1600 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WU20PM
P3–P4	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WU20PM
P5–P6	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WP35CM
M1–M2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
M3	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WP35CM
K1–K2	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MM	WU20PM
K3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WK15CM
N1–N2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
N3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S1–S2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S4	.S..MM	WP35CM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
H1	.S..MM	WU20PM	–	–	–	–

M1600 • Recommended Starting Speeds [m/min]

Material Group		WP35CM			WK15CM			WU20PM		
P	1	455	**395**	370	–	–	–	330	**290**	270
	2	280	**255**	230	–	–	–	275	**250**	200
	3	255	**230**	205	–	–	–	255	**220**	175
	4	190	**175**	160	–	–	–	225	**190**	150
	5	260	**230**	210	–	–	–	185	**175**	150
	6	160	**135**	110	–	–	–	165	**130**	100
M	1	205	**185**	155	–	–	–	205	**180**	165
	2	185	**160**	140	–	–	–	185	**160**	130
	3	145	**130**	115	–	–	–	140	**120**	95
K	1	295	**265**	240	420	**385**	340	250	**220**	185
	2	235	**210**	190	335	**295**	275	200	**180**	150
	3	195	**175**	160	280	**250**	230	180	**150**	120
N	1	–	–	–	–	–	–	550	**470**	400
	2	–	–	–	–	–	–	550	**470**	400
	3	–	–	–	–	–	–	400	**350**	300
S	1	–	–	–	–	–	–	40	**35**	25
	2	–	–	–	–	–	–	40	**35**	25
	3	–	–	–	–	–	–	50	**40**	25
	4	–	–	–	–	–	–	70	**50**	35
H	1	–	–	–	–	–	–	110	**80**	70

*NOTE: First choice starting feed (fz) is in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M1600 • Recommended Starting Feeds [mm]

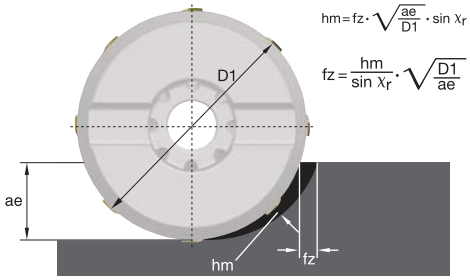
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,26	**0,85**	1,42	0,19	**0,62**	1,01	0,14	**0,46**	0,75	0,12	**0,40**	0,66	0,11	**0,37**	0,60	.S..MM

*NOTE: First choice starting feed (fz) is in **bold** type.*
Use corresponding speed (vc).
fz and vc are valid for ae ≥0,4 D1.
For smaller ae, fz and vc should be multiplied by the factor given below:

$$hm = fz \cdot \sqrt{\frac{ae}{D1}} \cdot \sin \chi_r$$

$$fz = \frac{hm}{\sin \chi_r} \cdot \sqrt{\frac{D1}{ae}}$$



M1200 Series

M1200 Mini, M1200, M1200 Max Face Mills

M1200 MINI

The M1200 mini face mill is a first-choice for low depth of cut face milling that will improve productivity on taper 40 spindle milling machines.

M1200

The M1200 standard sized face mill is an all-inclusive series that will improve productivity on taper 50 spindle milling machines and driven tools using 15-, 45-, and 60-degree lead angles.

M1200 MAX SCREW CLAMPING • FOR BIGGER STOCK REMOVAL

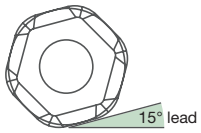
The M1200 Max is a 12-edged face mill for customers who need to run at a higher DOC (up to 7,5mm) in steel, stainless steel, gray cast iron, and nodular iron.

M1200 MAX WEDGE CLAMPING • FOR CAST IRON COMPONENTS

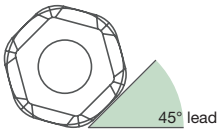
The M1200 Max wedge clamping is a 12-edged face mill for medium roughing - semi-finishing while running higher DOC (up to 7,5mm) in gray cast iron and nodular iron components.

ONE INSERT STYLE FITS INTO ALL DIFFERENT CUTTER BODY VERSIONS

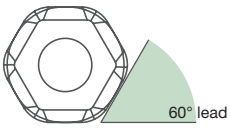
M1200 &
M1200 MINI HF
High-Feed 15°



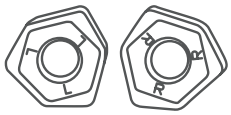
M1200 &
M1200 MINI
45°



M1200 &
M1200 MINI HD
60°



WIPER
(XNGJ)



3RH + 3LH

12-EDGED FACE MILL

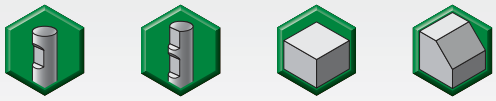
PRODUCT

SERIES	DIAMETER RANGE
M1200 MINI HNPJ0905... - PRESSED AND SINTERED TO SIZE HNGJ0905... - PRECISION GROUND	25–125mm
M1200 HNPJ0905... - PRESSED AND SINTERED TO SIZE HNGJ0905... - PRECISION GROUND	40–315mm
M1200 MAX HNMU1107...- PRESSED AND SINTERED TO SIZE HNMF1107...-PRESSED AND SINTERED TO SIZE	63–250mm

INSERTS

GEOMETRY	GRADE	MATERIALS
LDJ — Machining Aluminum	WK15CM, WK25YM	K
	WP35CM, WP25PM	P M S
LD — Light Machining	WP40PM	P M
GD — General Purpose	WS30PM	S
	WS40PM	P M S
HD — Heavy Machining	TN6501, THM-U	N
MM — Medium Machining	WK15CM, WP35CM, WU20PM	P M K

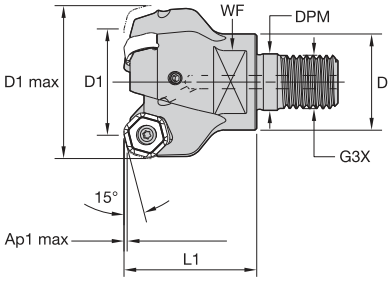
APPLICATIONS



WELDON® SHANK | WELDON: 2 FLAT | FACE MILLING | EASED CHAMFER

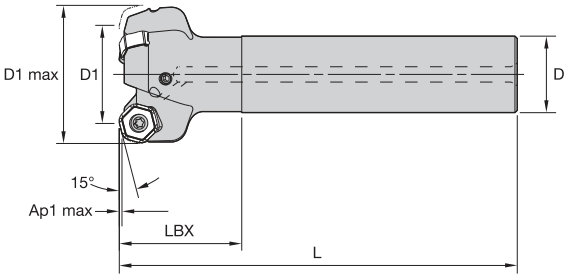
INDUSTRY

M1200 Mini • 15° • High Feed • Screw-On End Mills • Metric



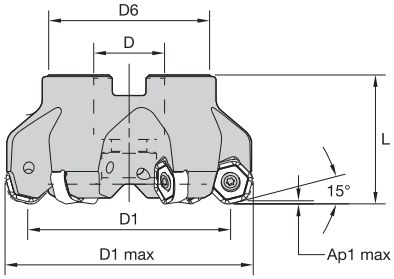
order number	catalogue number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	kg
4136875	M1200HF025Z03M16HN07	25	39	29	17,0	M16	32	22	1,7	3	20000	Yes	0,2

M1200 Mini • 15° • High Feed • Cylindrical Shank • Metric



order number	catalogue number	D1	D1 max	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4136882	M1200HF032Z03A25HN07L130	32	46,1	25	130	40	1,7	3	17600	Yes	0,52
4136883	M1200HF032Z04A25HN07L130	32	46,1	25	130	40	1,7	4	17600	Yes	0,53

M1200 Mini • 15° • High Feed • Shell Mills • Metric

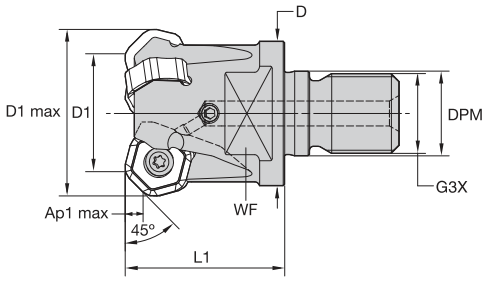


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136884	M1200HF040Z05HN07	40	54,1	22	38	40	1,7	5	15800	Yes	0,29
4136885	M1200HF050Z05HN07	50	64,1	22	38	40	1,7	5	12700	Yes	0,40
4136886	M1200HF063Z06HN07	63	77,1	22	50	40	1,7	6	10100	Yes	0,67
4136887	M1200HF080Z08HN07	80	94,1	27	60	50	1,7	8	7900	Yes	1,26

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

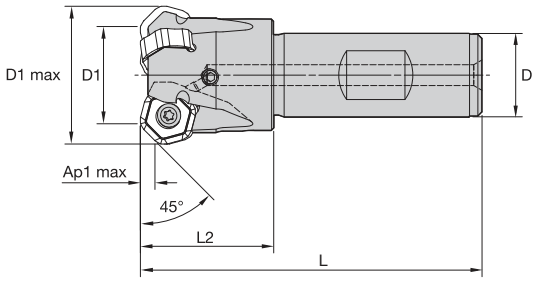
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1200 Mini • 45° • Screw-On End Mills • Metric



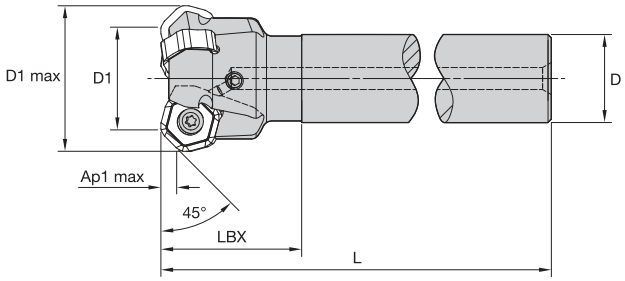
order number	catalogue number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	kg
3957840	M1200D025Z03M16HN07	25	33,7	29	17,0	M16	32	22	3,5	3	20000	Yes	0,13
3957841	M1200D032Z03M16HN07	32	40,7	29	17,0	M16	40	22	3,5	3	17600	Yes	0,20
3957842	M1200D032Z04M16HN07	32	40,7	29	17,0	M16	40	22	3,5	4	17600	Yes	0,20

M1200 Mini • 45° • Weldon® End Mills • Metric



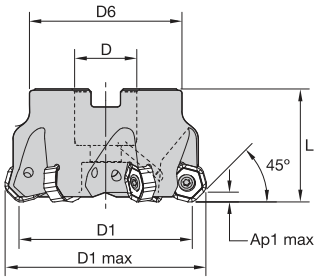
order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3958012	M1200D025Z03B20HN07	25	33,7	20	82	32	3,5	3	20000	Yes	0,21
3958023	M1200D032Z03B25HN07	32	40,7	25	97	40	3,5	3	17600	Yes	0,39
3958024	M1200D032Z04B25HN07	32	40,7	25	97	40	3,5	4	17600	Yes	0,40

M1200 Mini • 45° • Cylindrical Shank • Metric



order number	catalogue number	D1	D1 max	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
3958025	M1200D025Z02A20HN07L120	25	33,7	20	120	32	3,5	2	20000	Yes	0,29
3958026	M1200D025Z03A20HN07L120	25	33,7	20	120	32	3,5	3	20000	Yes	0,28
3958029	M1200D025Z02A25HN07L200	25	33,7	25	200	32	3,5	2	20000	Yes	0,72
3958030	M1200D025Z03A25HN07L200	25	33,7	25	200	32	3,5	3	20000	Yes	0,71
3958027	M1200D032Z03A25HN07L130	32	40,7	25	130	40	3,5	3	17600	Yes	0,49
3958028	M1200D032Z04A25HN07L130	32	40,7	25	130	40	3,5	4	17600	Yes	0,50

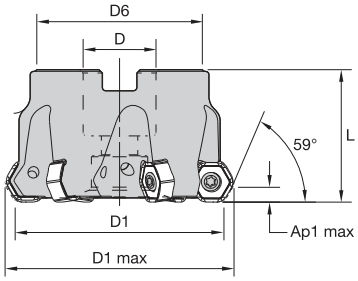
M1200 Mini • 45° • Shell Mills • Metric



order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3957995	M1200D040Z04HN07	40	48,7	22	38	40	3,5	4	15800	Yes	0,26
3957996	M1200D040Z05HN07	40	48,7	22	38	40	3,5	5	15800	Yes	0,26
3957997	M1200D050Z04HN07	50	58,7	22	38	40	3,5	4	12700	Yes	0,35
3957998	M1200D050Z05HN07	50	58,7	22	38	40	3,5	5	12700	Yes	0,36
3957999	M1200D050Z06HN07	50	58,7	22	38	40	3,5	6	12700	Yes	0,35
3958000	M1200D063Z04HN07	63	71,7	22	50	40	3,5	4	10100	Yes	0,58
3958001	M1200D063Z06HN07	63	71,7	22	50	40	3,5	6	10100	Yes	0,65
3958002	M1200D063Z08HN07	63	71,7	22	50	40	3,5	8	10100	Yes	0,62
3958003	M1200D080Z05HN07	80	88,7	27	60	50	3,5	5	7900	Yes	1,11
3958004	M1200D080Z08HN07	80	88,7	27	60	50	3,5	8	7900	Yes	1,24
3958005	M1200D080Z10HN07	80	88,7	27	60	50	3,5	10	7900	Yes	1,17
3958006	M1200D100Z06HN07	100	108,7	32	80	50	3,5	6	6300	Yes	1,71
3958007	M1200D100Z09HN07	100	108,7	32	80	50	3,5	9	6300	Yes	1,82
3958008	M1200D100Z12HN07	100	108,7	32	80	50	3,5	12	6300	Yes	1,82
4138470	M1200D125Z08HN07	125	133,7	40	90	63	3,5	8	5050	Yes	2,84
4138471	M1200D125Z12HN07	125	133,7	40	90	63	3,5	12	5050	Yes	2,96
4138472	M1200D125Z16HN07	125	133,7	40	90	63	3,5	16	5050	Yes	3,02

NOTE: Mounting screw with coolant groove, coolant screw assembly, coolant lock screw, and coolant cap must be ordered separately.

M1200 Mini • 60° • Shell Mills • Metric



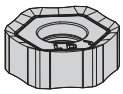
order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136863	M1200HD040Z05HN07	40	46,8	22	38	40	4,7	5	15800	Yes	0,22
4136865	M1200HD050Z05HN07	50	56,8	22	38	40	4,7	5	12700	Yes	0,34
4136867	M1200HD063Z06HN07	63	69,8	22	50	40	4,7	6	10100	Yes	0,60
4136868	M1200HD080Z05HN07	80	86,8	27	60	50	4,7	5	7900	Yes	1,11
4136869	M1200HD080Z08HN07	80	86,8	27	60	50	4,7	8	7900	Yes	1,17
4136870	M1200HD100Z06HN07	100	106,7	32	80	50	4,7	6	6300	Yes	1,74
4136871	M1200HD100Z09HN07	100	106,7	32	80	50	4,7	9	6300	Yes	1,74
4136872	M1200HD125Z08HN07	125	131,7	40	90	63	4,7	8	5050	Yes	2,86
4136873	M1200HD125Z12HN07	125	131,7	40	90	63	4,7	12	5050	Yes	2,90

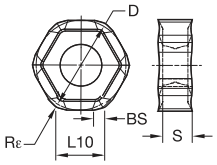
NOTE: Mounting screw with coolant groove, coolant screw assembly, coolant lock screw, and coolant cap must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1200 Mini • HNGJ-LDJ • HN0704



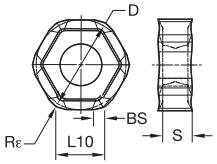


● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	●	○	●
M					○	●		●	●	●	●	●
K	●		●	●	○	○	●	○	○			
N	○	●										○
S						●		●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0704ANFNLDJ	12	13	6,84	4,48	1,51	1,20	0,08	3954332	3954414	-	-	-	-	-	-	-	-	-	-

M1200 Mini • HNGJ-LD • HN0704

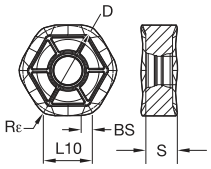


● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	●	○	●
M					○	●		●	●	●	●	●
K	●		●	●	○	○	●	○	○			
N	○	●										○
S						●		●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ070432ANENLD	12	13	6,00	4,48	–	3,21	0,08	-	-	-	-	-	-	-	-	-	-	-	6180300
HNGJ0704ANENLD	12	13	6,84	4,48	1,60	1,20	0,08	-	-	3954419	3954420	3954421	3954422	-	5895291	5895292	5550905	5528975	6180295

M1200 Mini • HNPJ-GD • HN0704

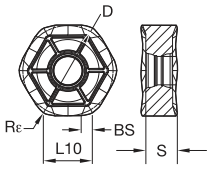


● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	●	○	●
M					○	●		●	●	●	●	●
K	●		●	●	○	○	●	○	○			
N	○	●										○
S						●		●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNPJ0704ANSNGD	12	13	6,80	4,45	1,45	1,20	0,10	-	-	3954432	3954473	-	3954474	5427374	5895293	5895294	5550906	5528976	6180297

M1200 Mini • HNPJ-HD • HN0704

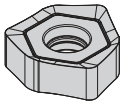


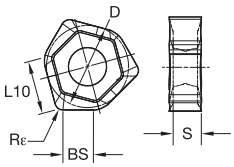
● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	●	○	●
M					○	●		●	●	●	●	●
K	●		●	●	○	○	●	○	○			
N	○	●										○
S						●		●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNPJ0704ANSNHD	12	13	6,80	4,41	1,45	1,20	0,14	-	-	-	3954478	-	3954479	5427375	5895295	5895296	5550907	-	6180299
HNPJ070432ANSNHD	12	13	6,84	4,42	—	3,20	0,14	-	-	-	3954482	-	3954483	-	-	-	5895297	-	6180311

M1200 Mini • XNGJ-LDJ-3 Wiper • XN0704



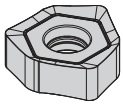


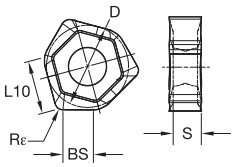
● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	●	○	●
M					○	●		●	●	●	●	●
K	●		●	●	○	○	●	○	○			
N	○	●										○
S						●		●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
XNGJ0704ANFNLDJ3W	3	13	6,78	4,47	6,78	1,30	0,08	3954433	-	-	-	-	-	-	-	-	-	-	-

M1200 Mini • XNGJ-LD3 Wiper • XN0704





● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●		●	●	●	○	●
M					○	●		●	●	●	●	●
K	●		●	●	○	○	●	○	○			
N	○	●										○
S						●		●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
XNGJ0704ANENLD3W	3	13	6,78	4,47	6,78	1,30	0,08	-	-	-	3954425	3954426	3954427	5427373	5895298	-	5895299	-	6180296

M1200 Mini • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.E..LD	WP40PM	**.S..GD**	**WP40PM**	.S..HD	WP40PM
P3–P4	.E..LD	WP25PM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
P5–P6	.E..LD	WP25PM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
M1–M2	.E..LD	WP25PM	**.S..GD**	**WP25PM**	.S..HD	WP25PM
M3	.E..LD	WP35CM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
K1–K2	.E..LD	TN6510	**.S..GD**	**WK15CM**	.S..HD	WK15CM
K3	.E..LD	WP35CM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
N1–N2	.F..LDJ	TN6501	**.F..LDJ**	**TN6501**	.F..LDJ	TN6501
N3	.F..LDJ	TN6501	**.F..LDJ**	**TN6501**	.F..LDJ	TN6501
S1–S2	.E..LD	WS30PM	**.S..GD**	**WS30PM**	.S..HD	WP25PM
S3	.E..LD	WS30PM	**.S..GD**	**WS30PM**	.S..GD	WS30PM
S4	.E..LD	WS30PM	**.S..GD**	**WS30PM**	.S..HD	WP40PM

M1200 Mini • Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			WK15CM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	335	**300**	275
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	50	**35**	30	–	–	–
	2	–	–	–	–	–	–	–	–	–	25	**20**	10	–	–	–
	3	–	–	–	–	–	–	–	–	–	70	**40**	30	–	–	–
	4	–	–	–	–	–	–	–	–	–	60	**30**	25	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WP25PM			WP35CM			WP40PM			WS30PM			WS40PM			TN6501			THM-U		
P	1	395	**340**	325	545	**475**	445	355	**310**	295	–	–	–	–	–	–	–	–	–	–	–	–
	2	330	**290**	240	335	**305**	275	300	**260**	215	–	–	–	–	–	–	–	–	–	–	–	–
	3	305	**260**	210	305	**275**	245	275	**235**	190	–	–	–	–	–	–	–	–	–	–	–	–
	4	270	**220**	180	230	**210**	190	245	**205**	160	–	–	–	–	–	–	–	–	–	–	–	–
	5	220	**205**	180	310	**275**	250	205	**185**	160	–	–	–	205	**175**	145	–	–	–	–	–	–
	6	200	**150**	120	190	**160**	130	180	**140**	110	–	–	–	180	**130**	95	–	–	–	–	–	–
M	1	245	**215**	200	245	**220**	185	235	**205**	185	270	**240**	220	250	**205**	170	–	–	–	–	–	–
	2	220	**190**	155	220	**190**	170	210	**180**	150	245	**215**	175	215	**175**	145	–	–	–	–	–	–
	3	170	**145**	115	175	**155**	140	155	**140**	110	185	**160**	125	175	**130**	100	–	–	–	–	–	–
K	1	275	**245**	220	355	**320**	290	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	215	**190**	180	280	**250**	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	180	**160**	145	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2400	**1440**	1200	2400	**1440**	1200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1640	**980**	800	1640	**980**	800
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	960	**600**	480	960	**600**	480
S	1	50	**40**	30	–	–	–	50	**40**	35	55	**50**	35	50	**40**	30	–	–	–	–	–	–
	2	50	**40**	30	–	–	–	50	**40**	35	55	**50**	35	50	**40**	30	–	–	–	–	–	–
	3	60	**50**	30	–	–	–	60	**50**	35	65	**55**	35	60	**50**	30	–	–	–	–	–	–
	4	85	**60**	40	80	**60**	40	80	**60**	40	100	**70**	50	70	**60**	35	–	–	–	–	–	–
H	1	145	**110**	85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

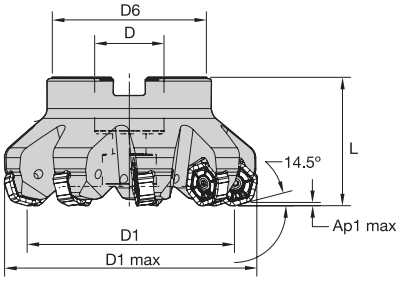
M1200 Mini • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..LDJ	0,48	0,89	1,81	0,34	0,64	1,29	0,26	0,48	0,96	0,22	0,42	0,83	0,21	0,38	0,76	.F..LDJ
.E..LD	0,48	1,38	2,85	0,34	0,99	2,00	0,26	0,74	1,48	0,22	0,64	1,28	0,21	0,59	1,17	.E..LD
.S..GD	0,92	2,35	3,89	0,66	1,67	2,70	0,49	1,23	1,98	0,43	1,07	1,72	0,39	0,98	1,57	.S..GD
.S..HD	0,92	2,35	3,89	0,66	1,67	2,70	0,49	1,23	1,98	0,43	1,07	1,72	0,39	0,98	1,57	.S..HD

NOTE: Use "Light Machining" value as starting feed rate.

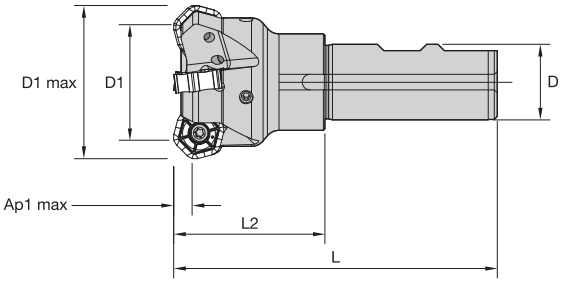
M1200 • 15° • High Feed • Shell Mills • Metric



order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3750370	M1200HF050Z04HN09	50	67,9	22	38	40	2,2	4	11400	Yes	0,65
3750372	M1200HF063Z05HN09	63	80,9	22	50	40	2,2	5	8950	Yes	0,65
3750434	M1200HF080Z06HN09	80	97,9	27	60	50	2,2	6	7300	Yes	1,24
3750435	M1200HF100Z08HN09	100	117,9	32	80	50	2,2	8	5900	Yes	1,89
3750436	M1200HF125Z09HN09	125	142,9	40	90	63	2,2	9	4800	Yes	3,23

NOTE: Socket-head cap screw with coolant groove, coolant lock screw assembly, coolant lock screw, and coolant cap must be ordered separately.

M1200 • 45° • Weldon® End Mills • Metric

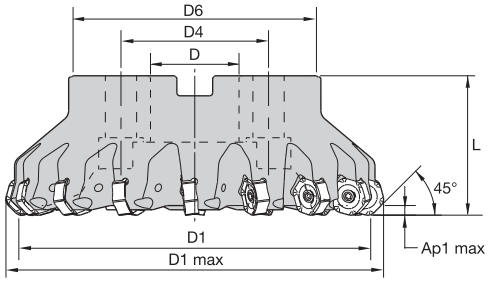


order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3325311	M1200D040Z04B25HN09	40	51,0	25	107	50	4,5	4	15800	Yes	0,52

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

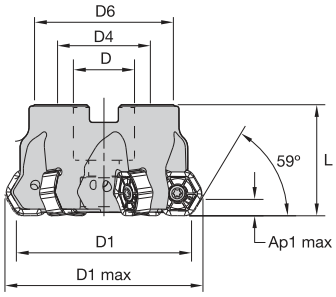
M1200 • 45° • Shell Mills • Metric



order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3957970	M1200D040Z03HN09	40	51,0	22	—	39	40	4,4	3	15800	Yes	0,26
3957971	M1200D040Z04HN09	40	51,0	22	—	39	40	4,4	4	15800	Yes	0,25
3325312	M1200D050Z04HN09	50	61,0	22	—	38	40	4,5	4	12700	Yes	0,32
3325693	M1200D050Z05HN09	50	61,0	22	—	38	40	4,5	5	12700	Yes	0,33
3650535	M1200D063Z04HN09	63	74,0	22	—	50	40	4,5	4	10100	Yes	0,59
3093594	M1200D063Z06HN09	63	74,0	22	—	50	40	4,5	6	10100	Yes	0,56
3025376	M1200D063Z07HN09	63	74,0	22	—	50	40	4,5	7	10100	Yes	0,57
3650536	M1200D080Z05HN09	80	91,0	27	—	60	50	4,5	5	7900	Yes	1,12
3081507	M1200D080Z06HN09	80	91,0	27	—	60	50	4,5	6	7900	Yes	1,07
3025377	M1200D080Z09HN09	80	91,0	27	—	60	50	4,5	9	7900	Yes	1,11
3650537	M1200D100Z06HN09	100	111,0	32	—	80	50	4,5	6	6300	Yes	1,73
3325694	M1200D100Z08HN09	100	111,0	32	—	80	50	4,5	8	6300	Yes	1,68
3025378	M1200D100Z11HN09	100	111,0	32	—	80	50	4,5	11	6300	Yes	1,73
3650538	M1200D125Z08HN09	125	135,9	40	—	90	63	4,5	8	5050	Yes	2,84
3081508	M1200D125Z10HN09	125	135,9	40	—	90	63	4,5	10	5050	Yes	2,77
3093593	M1200D125Z14HN09	125	136,0	40	—	90	63	4,5	14	5050	Yes	2,86
3066118	M1200D160Z12HN09	160	171,0	40	66,7	110	63	4,5	12	3900	Yes	4,56
3066119	M1200D160Z16HN09	160	171,0	40	66,7	110	63	4,5	16	3900	Yes	4,70
3957972	M1200D200Z16HN09	200	211,0	60	101,6	130	63	4,5	16	3180	Yes	6,43
3957993	M1200D250Z20HN09	250	261,0	60	101,6	130	63	4,5	20	2550	Yes	9,93
3957994	M1200D315Z24HN09	315	326,0	60	101,6	230	80	4,5	24	2020	Yes	22,90

NOTE: Socket-head cap screw with coolant groove, coolant screw assembly, coolant lock screw, and coolant cap must be ordered separately.

M1200 • 60° • Shell Mills • Metric



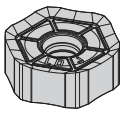
order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4152116	M1200HD063Z06HN09	63	71,5	22	—	50	40	6,0	6	10100	Yes	0,55
4152117	M1200HD080Z05HN09	80	88,5	27	—	60	50	6,0	5	7900	Yes	1,05
4152118	M1200HD080Z08HN09	80	88,5	27	—	60	50	6,0	8	7900	Yes	1,10
4152119	M1200HD100Z06HN09	100	108,5	32	—	80	50	6,0	6	6300	Yes	1,61
4152120	M1200HD100Z08HN09	100	108,5	32	—	80	50	6,0	8	6300	Yes	1,63
4152121	M1200HD125Z08HN09	125	133,5	40	—	90	63	6,0	8	5050	Yes	2,88
4152123	M1200HD160Z09HN09	160	168,5	40	66,7	110	63	6,0	9	3900	Yes	4,62

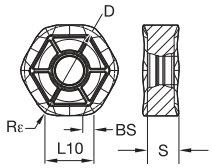
NOTE: Coolant screw assembly, coolant lock screw, and coolant cap must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1200 • HNGJ-LDJ • HN0905



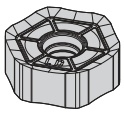


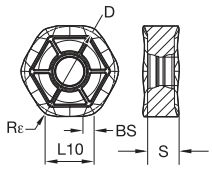
● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0905ANFNLDJ	12	16	8,58	5,56	1,81	1,20	0,02	3606383	3865373	-	-	-	-	-	-	-	-	-	-	-

M1200 • HNGJ-LD • HN0905



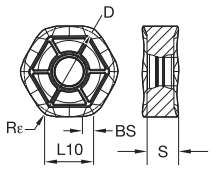


● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0905ANENLD	12	16	8,58	5,56	1,76	1,20	0,05	-	-	-	3093559	3330950	3030034	-	-	5895346	5895347	5895348	5528973	6180276

M1200 • HNPJ-GD • HN0905

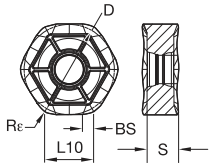


● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNPJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	-	-	-	3761185	-	3761187	5427372	-	5895374	5895375	5550908	-	6180278

M1200 • HNGJ-GD • HN0905

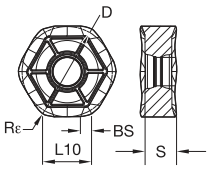


● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0905ANSNGD	12	16	8,59	5,56	1,71	1,20	0,10	-	-	-	3119541	3614650	3037596	5427370	-	5400965	5895349	5895350	5528974	6180280

M1200 • HNPJ-HD • HN0905

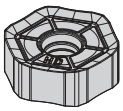


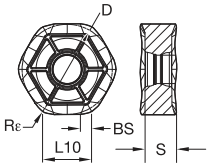
● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNPJ090543ANSNHD	12	16	8,50	5,44	–	4,35	0,13	-	-	-	3670866	-	3670865	-	-	5895378	5895379	5895380	-	6180294
HNPJ0905ANSNHD	12	16	8,59	5,46	1,65	1,20	0,18	-	-	-	3670864	-	3670842	5427371	-	5895376	5895377	5550909	-	6180279

M1200 • HNGJ-HD • HN0905



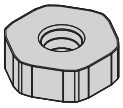


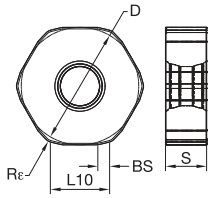
● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ090543ANSNHD	12	16	8,50	5,44	–	4,35	0,20	-	-	-	3564083	3564084	3564085	-	-	-	-	-	-	6180292
HNGJ0905ANSNHD	12	16	8,59	5,46	1,65	1,20	0,17	-	-	-	3563900	3563901	3563902	-	-	5895371	5895372	5895373	-	6180291

M1200 • HNEC • HN0905



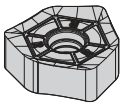


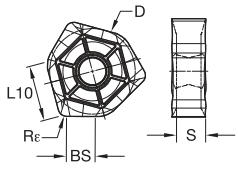
● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNEC0905ANSN	12	16	9,17	5,56	1,95	1,20	0,19	-	-	-	-	-	-	-	5910033	-	-	-	-	-

M1200 • XNGJ-GD3 Wiper • HN0905





● first choice
○ alternate choice

	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P					●	●			●	●	●	○	●
M					○	●			●	●	●	●	●
K	●		●	●	○	○	●	●	○	○			
N	○	●											○
S						●			●	○	○	●	●
H									○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6501	TN6510	TN6520	TN6525	TN6540	WK15CM	WK25YM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
XNGJ0905ANSNGD3W	6	16	9,56	5,51	6,00	1,60	0,09	-	-	3117962	3524707	3523620	3066479	5622622	-	5895381	-	5895382	-	6180277

M1200 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.E..LD	WP40PM	**.S..GD**	**WP40PM**	.S..HD	WP40PM
P3–P4	.E..LD	WP25PM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
P5–P6	.E..LD	WP25PM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
M1–M2	.E..LD	WP25PM	**.S..GD**	**WP25PM**	.S..HD	WP25PM
M3	.E..LD	WP35CM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
K1–K2	.E..LD	TN6520	**.S..GD**	**WK15CM**	.S..HD	WK15CM
K3	.E..LD	WP35CM	**.S..GD**	**WP35CM**	.S..HD	WP35CM
N1–N2	.F..LDJ	TN6501	**.F..LDJ**	**TN6501**	.F..LDJ	TN6501
N3	.F..LDJ	TN6501	**.F..LDJ**	**TN6501**	.F..LDJ	TN6501
S1–S2	.E..LD	WS30PM	**.S..GD**	**WS30PM**	.S..HD	WP25PM
S3	.E..LD	WS30PM	**.S..GD**	**WS30PM**	.S..HD	WP40PM
S4	.E..LD	WS30PM	**.S..GD**	**WS30PM**	.S..HD	WP40PM

M1200 • Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			WK15CM			WP25PM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	–	–	–	395	**340**	325
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	–	–	–	330	**290**	240
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	–	–	–	305	**260**	210
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	–	–	–	270	**220**	180
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	–	–	–	220	**205**	180
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	–	–	–	200	**150**	120
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	–	–	–	245	**215**	200
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	–	–	–	220	**190**	155
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	–	–	–	170	**145**	115
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	505	**460**	410	275	**245**	220
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	400	**355**	330	215	**190**	180
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	335	**300**	275	180	**160**	145
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	50	**35**	30	–	–	–	50	**40**	30
	2	–	–	–	–	–	–	–	–	–	25	**20**	10	–	–	–	50	**40**	30
	3	–	–	–	–	–	–	–	–	–	70	**40**	30	–	–	–	60	**50**	30
	4	–	–	–	–	–	–	–	–	–	60	**30**	25	–	–	–	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	145	**110**	85
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WK25YM			TN6501			THM-U		
P	1	545	**475**	445	355	**310**	295	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	335	**305**	275	300	**260**	215	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	305	**275**	245	275	**235**	190	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	230	**210**	190	245	**205**	160	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	5	310	**275**	250	205	**185**	160	–	–	–	205	**175**	145	–	–	–	–	–	–	–	–	–
	6	190	**160**	130	180	**140**	110	–	–	–	180	**130**	95	–	–	–	–	–	–	–	–	–
M	1	245	**220**	185	235	**205**	185	270	**240**	220	250	**205**	170	–	–	–	–	–	–	–	–	–
	2	220	**190**	170	210	**180**	150	245	**215**	175	215	**175**	145	–	–	–	–	–	–	–	–	–
	3	175	**155**	140	155	**140**	110	185	**160**	125	175	**130**	100	–	–	–	–	–	–	–	–	–
K	1	355	**320**	290	–	–	–	–	–	–	–	–	–	965	**880**	780	–	–	–	–	–	–
	2	280	**250**	230	–	–	–	–	–	–	–	–	–	765	**685**	635	–	–	–	–	–	–
	3	235	**210**	190	–	–	–	–	–	–	–	–	–	645	**570**	525	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2400	**1440**	1200	2400	**1440**	1200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1640	**980**	800	1640	**980**	800
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	960	**600**	480	960	**600**	480
S	1	–	–	–	50	**40**	35	55	**50**	35	50	**40**	30	–	–	–	–	–	–	–	–	–
	2	–	–	–	50	**40**	35	55	**50**	35	50	**40**	30	–	–	–	–	–	–	–	–	–
	3	–	–	–	60	**50**	35	65	**55**	35	60	**50**	30	–	–	–	–	–	–	–	–	–
	4	80	**60**	40	80	**60**	40	100	**70**	50	70	**60**	35	–	–	–	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

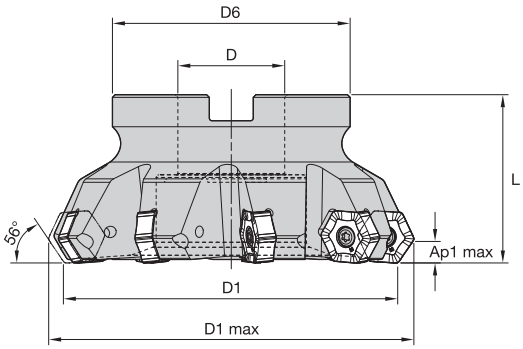
M1200 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..LDJ	0,17	0,33	0,66	0,12	0,24	0,47	0,09	0,18	0,35	0,08	0,15	0,31	0,07	0,14	0,28	.F..LDJ
.E..LD	0,17	0,49	0,99	0,12	0,35	0,71	0,09	0,27	0,53	0,08	0,23	0,46	0,07	0,21	0,42	.E..LD
.S..GD	0,26	0,84	1,35	0,19	0,60	0,97	0,14	0,45	0,72	0,12	0,39	0,63	0,11	0,36	0,57	.S..GD
.S..HD	0,33	0,84	1,35	0,24	0,60	0,97	0,18	0,45	0,72	0,16	0,39	0,63	0,14	0,36	0,57	.S..HD
.S..Ceramic	0,17	0,33	0,49	0,12	0,24	0,35	0,09	0,18	0,27	0,08	0,15	0,23	0,07	0,14	0,21	.S..Ceramic

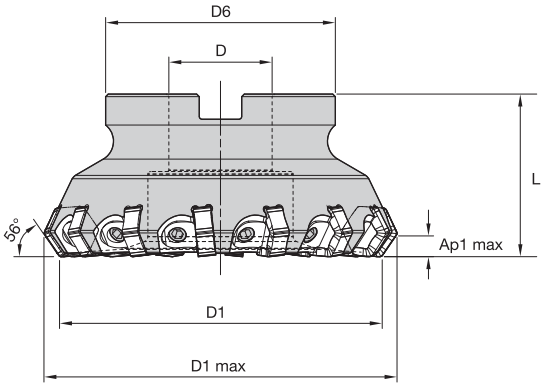
NOTE: Use "Light Machining" value as starting feed rate.

M1200 Max Screw Clamping • 56° • Shell Mills • Metric



order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6581490	M1200D080Z05S27HN11	80	91,8	27	60	50	7,5	5	—	No	0,99
6495103	M1200D100Z07S32HN11	100	111,8	32	78	50	7,5	7	8100	No	1,49
6495104	M1200D125Z09S40HN11	125	136,7	40	89	63	7,5	9	—	No	2,72
6581561	M1200D160Z10S40HN11	160	171,7	40	90	63	7,5	10	—	No	3,81
6626921	M1200D200Z12S60HN11	200	211,7	60	130	63	7,5	12	—	No	6,88
6852419	M1200D250Z14S60HN11	250	261,7	60	130	63	7,5	14	—	No	6,88

M1200 Max Wedge Clamping • 56° • Shell Mills • Metric

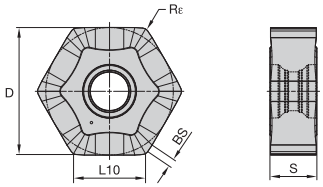


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6175726	M1200D063Z06S22HN11W	63	74,8	22	55	40	7,5	6	3600	No	0,56
6020535	M1200D080Z08S27HN11W	80	91,8	27	60	50	7,5	8	3100	No	1,17
6020523	M1200D100Z10S32HN11W	100	111,8	32	78	50	7,5	10	2700	No	1,73
6020530	M1200D125Z14S40HN11W	125	136,8	40	89	63	7,5	14	2400	No	3,05
6020621	M1200D160Z18S40HN11W	160	171,8	40	90	63	7,5	18	2050	No	4,19
6175727	M1200D200Z22S60HN11W	200	211,8	60	130	63	7,5	22	1800	No	7,43
6175728	M1200D250Z28S60HN11W	250	261,8	60	130	63	7,5	28	1600	No	10,81

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1200 Max Screw Clamping Inserts • HNMU-MM • Heavy-Duty Face Milling

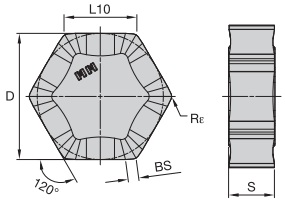


● first choice
○ alternate choice

P		●	●
M		●	●
K	●	○	○
N			○
S		○	○
H			○

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP35CM	WU20PM
HNMU110710ZNSNMM	12	19	10,75	6,92	1,20	1,00	0,06	6495106	6495105	6852420

M1200 Max Wedge Clamping Inserts • HNMF-MM



● first choice
○ alternate choice

P			●
M			●
K		●	○
N			
S			○
H			

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP35CM
HNMF110710ZNSNMM	12	19	10,75	6,87	1,20	1,00	0,06	6465300	6870109

M1200 Max • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WU20PM
P3–P4	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WU20PM
P5–P6	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WP35CM
M1–M2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
M3	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WP35CM
K1–K2	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MM	WU20PM
K3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WK15CM
N1–N2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
N3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S1–S2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S4	.S..MM	WP35CM	**.S..MM**	**WU20PM**	.S..MM	WU20PM

M1200 Max • Recommended Starting Speeds [m/min]

Material Group		WP35CM			WK15CM			WU20PM		
P	1	455	**395**	370	–	–	–	330	**290**	270
	2	280	**255**	230	–	–	–	275	**250**	200
	3	255	**230**	205	–	–	–	255	**220**	175
	4	190	**175**	160	–	–	–	225	**190**	150
	5	260	**230**	210	–	–	–	185	**175**	150
	6	160	**135**	–	–	–	–	165	**130**	100
M	1	205	**185**	155	–	–	–	205	**180**	165
	2	185	**160**	140	–	–	–	185	**160**	130
	3	145	**130**	115	–	–	–	140	**120**	95
K	1	295	**265**	240	420	**385**	340	250	**220**	185
	2	235	**210**	190	335	**295**	275	200	**180**	150
	3	195	**175**	160	280	**250**	230	180	**150**	120
N	1	–	–	–	–	–	–	550	**470**	400
	2	–	–	–	–	–	–	550	**470**	400
	3	–	–	–	–	–	–	400	**350**	300
S	1	–	–	–	–	–	–	40	**35**	25
	2	–	–	–	–	–	–	40	**35**	25
	3	–	–	–	–	–	–	50	**40**	25
	4	–	–	–	–	–	–	70	**50**	35
H	1	–	–	–	–	–	–	110	**80**	70

*NOTE: First choice starting feed (fz) is in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M1200 Max • Recommended Starting Feeds [mm]

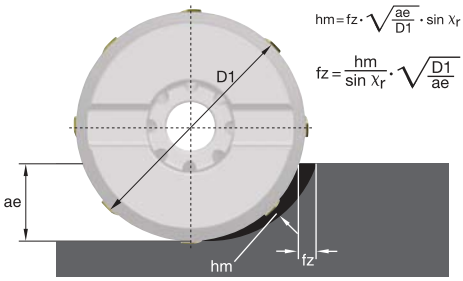
Light Machining	General Purpose	Heavy Machining

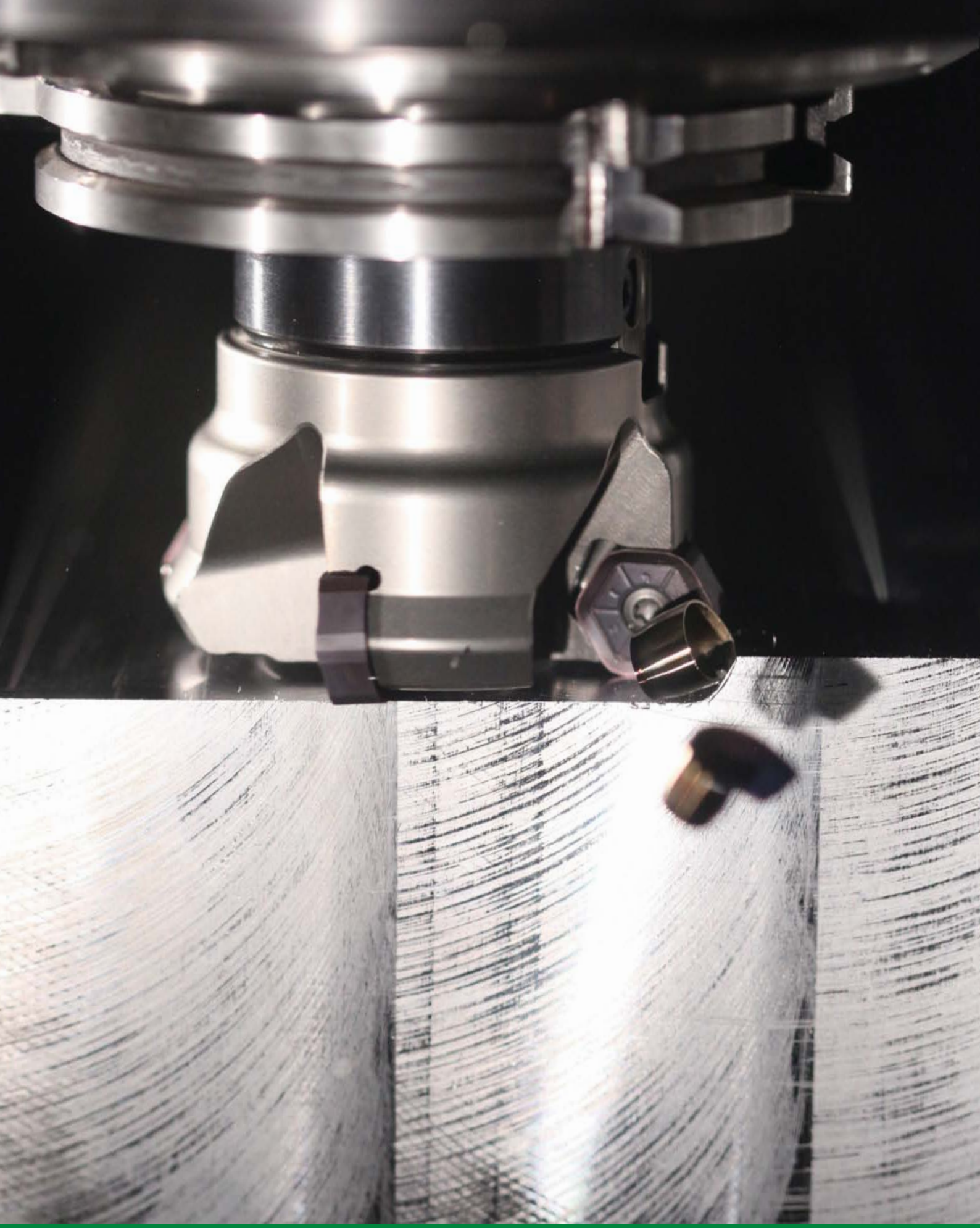
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,22	**0,71**	1,15	0,16	**0,51**	0,82	0,12	**0,38**	0,61	0,10	**0,33**	0,54	0,09	**0,31**	0,49	.S..MM

*NOTE: First choice starting feed (fz) is in **bold** type.*
Use corresponding speed (vc).
fz and vc are valid for ae ≥0,4 D1.
For smaller ae, fz and vc should be multiplied by the factor given below:

$$hm = fz \cdot \sqrt{\frac{ae}{D1}} \cdot \sin \chi_r$$

$$fz = \frac{hm}{\sin \chi_r} \cdot \sqrt{\frac{D1}{ae}}$$





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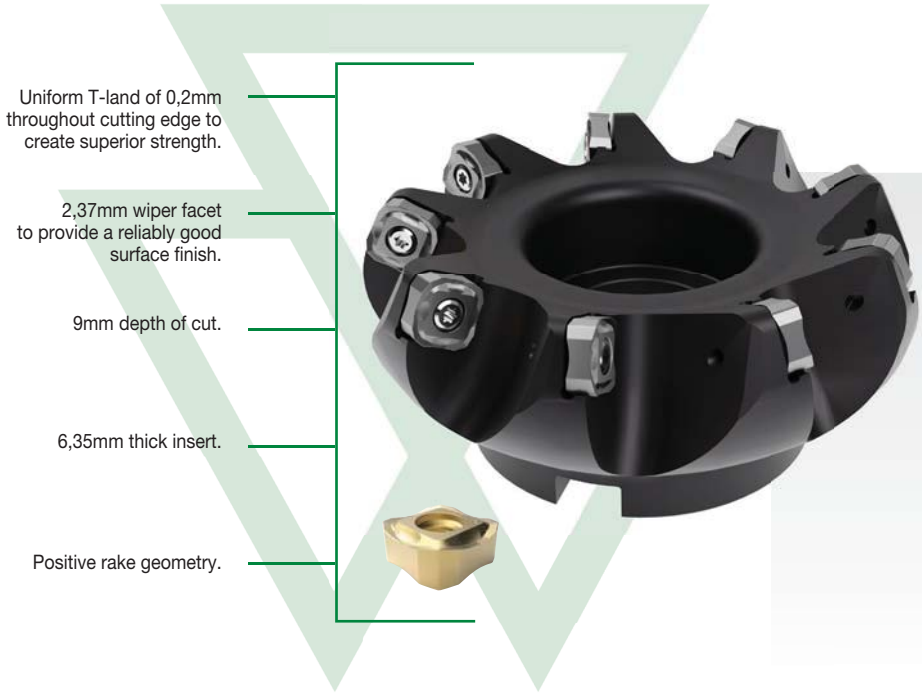
WIDIA™

M8065HD

M8065HD Face Mill

Use the M8065HD to easily confront heavy-duty milling jobs in steel and cast-iron materials by applying deep depths of cut while consistently maintaining high metal removal rates.



The M8065HD face mill features a thick insert with 8 cutting edges, ideal for heavy duty applications requiring bigger stock removal.

-MM

WK15CM

K

WK15CM is a wear-resistant grade with balanced toughness for general milling of cast irons. Best results in dry machining, but can also be used wet.

WP35CM

P K

WP35CM has a wide range of applications in general and rough milling of steels and cast iron. Performs best in dry, but can also be used under wet conditions.

WU20PM

P M K N S H

WU20PM is a universal grade for machining of steel, stainless steel, and high-temperature alloys. Also suitable for machining of gray and nodular irons. Resists breakage and offers improved wear resistance and increased strength. Can be used for both dry and wet machining.

DIVE INTO THE DOC WITH M8065HD

PRODUCT

SERIES

M8065HD

DIAMETER RANGE

50–315mm

SHANK TYPES

Shell Mills

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

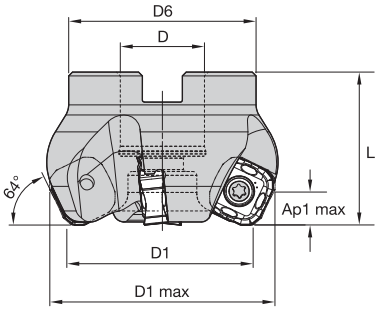
FACE MILLING

SIDE/SHOULDER MILLING: EASED CHAMFER

HEAVY DUTY

RELIABLE

M8065HD • 64° • Shell Mills • Metric

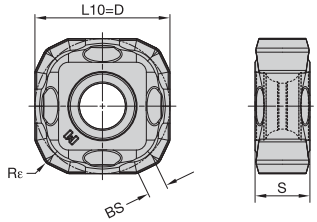


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	coolant supply	kg
4124248	M8065HD050Z04S22SN15	50	58,9	22	49	40	9,0	4	No	0,38
4102270	M8065HD063Z05S22SN15	63	71,9	22	49	40	9,0	5	No	0,53
4073639	M8065HD080Z06S27SN15	80	88,8	27	60	50	9,0	6	No	1,15
4073640	M8065HD100Z07S32SN15	100	108,8	32	78	50	9,0	7	No	1,68
4039413	M8065HD125Z09S40SN15	125	133,8	40	89	63	9,0	9	No	3,24
4061110	M8065HD160Z11S40SN15	160	168,8	40	90	63	9,0	11	No	4,33
4113702	M8065HD200Z14S60SN15	200	208,8	60	130	63	9,0	14	No	7,13
4113753	M8065HD250Z16S60SN15	250	258,8	60	130	63	9,0	16	No	11,52
4113754	M8065HD315Z20S60SN15	315	323,8	60	225	80	9,0	20	No	27,90

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M8065HD • SNMX-MM • Heavy-Duty Face Milling



● first choice
○ alternate choice

P		●	●
M		●	●
K	●	○	○
N			○
S		○	○
H			○

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP35CM	WU20PM
SNMX150612ZNSNMM	8	16	15,88	6,35	2,37	1,20	0,05	5649102	-	-
SNMX150612ZNSNMM	8	16	15,88	6,35	2,37	1,20	0,06	-	6852432	4137987
SNMX1506ZZXP	8	16	15,88	6,35	2,37	1,20	—	-	6901786	-

M8065HD • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WU20PM
P3–P4	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WU20PM
P5–P6	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WP35CM
M1–M2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
M3	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MM	WP35CM
K1–K2	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MM	WU20PM
K3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WK15CM
N1–N2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
N3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S1–S2	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S3	.S..MM	WU20PM	**.S..MM**	**WU20PM**	.S..MM	WU20PM
S4	.S..MM	WP35CM	**.S..MM**	**WU20PM**	.S..MM	WU20PM

M8065HD • Recommended Starting Speeds [m/min]

Material Group		WP35CM			WK15CM			WU20PM		
P	1	455	**395**	370	–	–	–	330	**290**	270
	2	280	**255**	230	–	–	–	275	**250**	200
	3	255	**230**	205	–	–	–	255	**220**	175
	4	190	**175**	160	–	–	–	225	**190**	150
	5	260	**230**	210	–	–	–	185	**175**	150
	6	160	**135**	–	–	–	–	165	**130**	100
M	1	205	**185**	155	–	–	–	205	**180**	165
	2	185	**160**	140	–	–	–	185	**160**	130
	3	145	**130**	115	–	–	–	140	**120**	95
K	1	295	**265**	240	420	**385**	340	250	**220**	185
	2	235	**210**	190	335	**295**	275	200	**180**	150
	3	195	**175**	160	280	**250**	230	180	**150**	120
N	1	–	–	–	–	–	–	550	**470**	400
	2	–	–	–	–	–	–	550	**470**	400
	3	–	–	–	–	–	–	400	**350**	300
S	1	–	–	–	–	–	–	40	**35**	25
	2	–	–	–	–	–	–	40	**35**	25
	3	–	–	–	–	–	–	50	**40**	25
	4	–	–	–	–	–	–	70	**50**	35
H	1	–	–	–	–	–	–	110	**80**	70

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M8065HD • Recommended Starting Feeds [mm]

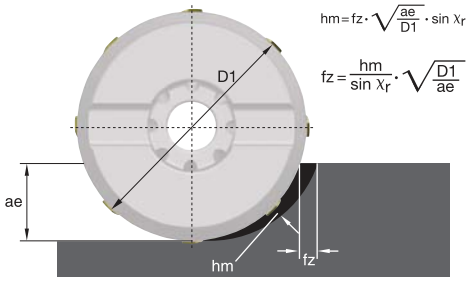
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,22	**0,65**	1,07	0,16	**0,47**	0,77	0,12	**0,35**	0,58	0,10	**0,31**	0,50	0,10	**0,28**	0,46	.S..MM

*NOTE: First choice starting feed (fz) is in **bold** type.*
Use corresponding speed (vc).
fz and vc are valid for ae ≥0,4 D1.
For smaller ae, fz and vc should be multiplied by the factor given below:

$$hm = fz \cdot \sqrt{\frac{ae}{D1}} \cdot \sin \chi_r$$

$$fz = \frac{hm}{\sin \chi_r} \cdot \sqrt{\frac{D1}{ae}}$$



widia.com

WIDIA™

M8090 Series

M8090, M8090-F Face Mills

The M8090 face mill series is an 8-edged, fine pitched face milling series for rough, semi-finish and finish milling of a variety of cast and nodular irons at high-feed rates.

Fine pitch.

Insert with eight cutting edges.

89-degree approach angle to machine close to the fixture.

Clamping wedge with double thread screw.

Rigid 'monoblock' cutter body design.

M8090

The M8090 face mill is designed with an 89° approach angle for rough and semi-finish milling applications in cast iron and nodular iron with the added flexibility of using carbide or ceramic inserts on the same cutter depending on productivity needs.

Fine pitch cutter with fixed pocket for semi-finisher inserts and adjustable pockets for wiper inserts.

Inserts with eight cutting edges, wiper inserts with four cutting edges.

Axial adjustable wiper pocket seats to set up axial run-out within 0,005mm.

Precision ground inserts and wiper.

M8090-F

The M8090-F finish mill is designed to achieve a surface finish <1,6 microns Ra in cast iron finish milling applications at high feeds.

WIPER INSERTS WITH FOUR EFFECTIVE CUTTING EDGES OFFERED IN CARBIDE GRADE WK15PM, AND CERAMICS WK25YM AND PCBN WBK40U

SNEN Insert

K

Ceramic insert with eight effective cutting edges

-MM Insert

K

Insert with eight effective cutting edges and a positive geometry to work on weak fixtures.

M8090-F Wiper Insert

K

Wiper inserts with four effective cutting edges.

HIGH-FEED CAST IRON ROUGHING, SEMI-FINISHING, AND FINISHING

PRODUCT

SERIES
M8090,
M8090-F

DIAMETER RANGE

M8090:
63–250mm

M8090F:
80–250mm

SHANK TYPES

Shell Mills

INDUSTRY

TRANSPORTATION

GENERAL ENGINEERING

APPLICATIONS

FACE MILLING

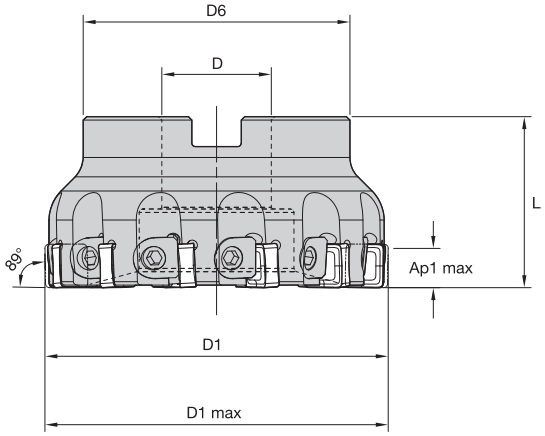
CAST IRON MILLING

Versatile, productive face mill for cast iron and ductile iron.

HIGH-FEED

Multiple insert configurations provide high surface quality at high cutting parameters in cast iron.

M8090 • 89° • Shell Mills • Metric

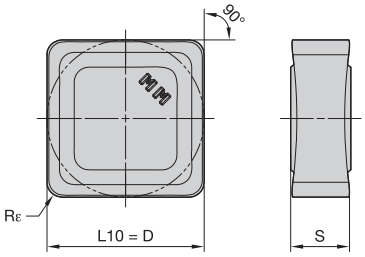


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6876426	M8090D063Z05S22SN12	63	63,4	22	49	40	11,5	5	6000	No	0,57
3858649	M8090D063Z07S22SN12	63	63,4	22	49	40	11,5	7	6000	No	0,54
5049033	M8090D080Z07S27SN12	80	80,4	27	60	50	11,5	7	4800	No	1,18
3767299	M8090D080Z09S27SN12	80	80,4	27	60	50	11,5	9	4800	No	1,16
6870509	M8090D100Z10S32SN12	100	100,4	32	78	50	11,5	10	3800	No	1,77
6467715	M8090D100Z12S32SN12	100	100,4	32	78	50	11,5	12	3800	No	1,74
3889658	M8090D125Z12S40SN12	125	125,4	40	89	63	11,5	12	–	No	3,17
6873027	M8090D125Z16S40SN12	125	125,4	40	89	63	11,5	16	–	No	3,11
3996360	M8090D160Z15S40SN12	160	160,4	40	90	63	11,5	15	–	No	4,51
6870508	M8090D160Z18S40SN12	160	160,4	40	90	63	11,5	18	–	No	4,46
6876428	M8090D200Z18S60SN12	200	200,4	60	130	63	11,5	18	–	No	7,48
6876429	M8090D200Z24S60SN12	200	200,4	60	130	63	11,5	24	–	No	7,38
6877402	M8090D250Z24S60SN12	250	250,4	60	130	63	11,5	24	–	No	12,34
6877403	M8090D250Z28S60SN12	250	250,4	60	130	63	11,5	28	–	No	12,27

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M8090 • Roughing Inserts • SNHF

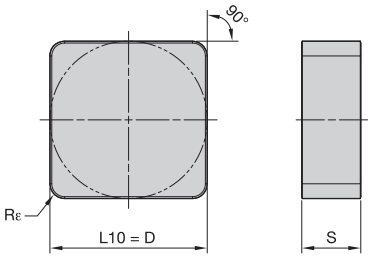


● first choice
○ alternate choice

P	
M	
K	● ● ●
N	
S	
H	

ISO catalogue number	cutting edges	D	L10	S	Rε	hm	WK15CM	WK15PM	WK25YM
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	0,05	●	6870510	●
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	–	6342141	●	●

M8090 • Ceramic Inserts • SNEN



● first choice
○ alternate choice

P	
M	
K	● ● ●
N	
S	
H	

ISO catalogue number	cutting edges	D	L10	S	Rε	hm	WK15CM	WK15PM	WK25YM
SNEN120412SNHN	4	12,70	12,70	4,76	1,20	0,04	●	●	6880278

M8090 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	–	–	–	–	–	–
P3–P4	–	–	–	–	–	–
P5–P6	–	–	–	–	–	–
M1–M2	–	–	–	–	–	–
M3	–	–	–	–	–	–
K1–K2	.S..HN	WK25YM	**.S..MM**	**WK15CM**	.S..MM	WK15CM
K3	.S..MM	WK15PM	**.S..MM**	**WK15PM**	.S..MM	WK15PM
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–

M8090 • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WK25YM		
P	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
K	1	420	**385**	340	325	**295**	260	965	**875**	780
	2	335	**295**	275	250	**230**	210	760	**685**	635
	3	280	**250**	230	210	**190**	175	640	**570**	520
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–

NOTE: FIRST choice starting speeds are in ***bold*** *type.*
As the average chip thickness increases, the speed should be decreased.

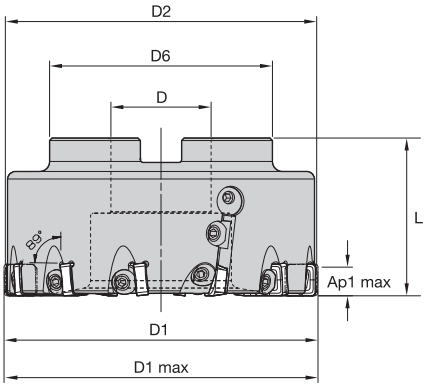
M8090 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,16	**0,58**	0,94	0,12	**0,42**	0,68	0,09	**0,31**	0,51	0,08	**0,27**	0,44	0,07	**0,25**	0,41	.S..MM
.S..HN	0,12	**0,40**	0,81	0,08	**0,29**	0,59	0,06	**0,22**	0,44	0,06	**0,19**	0,38	0,05	**0,18**	0,35	.S..HN

NOTE: Use "Light Machining" value as starting feed rate.
For new applications, starting at a lighter feed rate is recommended.
% = ae/Dc X 100 (ae = radial depth of cut, Dc = cutting diameter)

M8090-F • 89° • Shell Mills • Metric

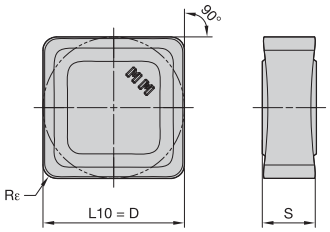


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	coolant supply	kg
6668000	M8090FD080Z08W2S27SN12	80	80,4	27	75	50	11,5	8	No	1,49
6750589	M8090FD100Z10W2S32SN12	100	100,4	32	95	50	11,5	10	No	2,21
6381961	M8090FD125Z12W2S40SN12	125	125,4	40	89	63	11,5	12	No	3,99
6779127	M8090FD160Z18W2S60SN12	160	160,4	40	89	63	11,5	18	No	6,85
6876424	M8090FD200Z24W4S60SN12	200	200,4	60	130	63	11,5	24	No	9,94
6876425	M8090FD250Z28W4S60SN12	250	250,4	60	130	63	11,5	28	No	13,46

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M8090 • Roughing Inserts • SNHF

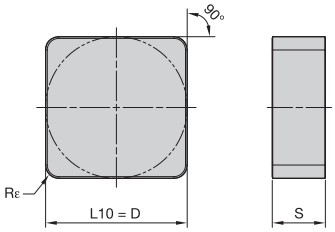


● first choice
○ alternate choice

	WK15CM	WK15PM	WK25YM
P			
M			
K	●	●	●
N			
S			
H			

ISO catalogue number	cutting edges	D	L10	S	Rε	hm	WK15CM	WK15PM	WK25YM
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	0,05	-	6870510	-
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	—	6342141	-	-

M8090 • Ceramic Inserts • SNEN

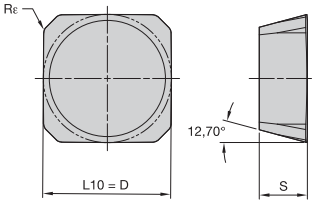


● first choice
○ alternate choice

	WK15CM	WK15PM	WK25YM
P			
M			
K	●	●	●
N			
S			
H			

ISO catalogue number	cutting edges	D	L10	S	Rε	hm	WK15CM	WK15PM	WK25YM
SNEN120412SNHN	4	12,70	12,70	4,76	1,20	0,04	-	-	6880278

M8090-F • Wiper Inserts • SDEN



● first choice
○ alternate choice

	THM-F	WBK40U	WK15CM	WK15PM	WK25YM
P					
M					
K	●	●	●	●	●
N	●				
S					
H					

ISO catalogue number	cutting edges	D	L10	S	BS	THM-F	WBK40U	WK15CM	WK15PM	WK25YM
SDEN1204PDEN4WC	4	12,70	12,70	4,76	9,00	6458851	6296241	-	-	-

M8090 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	–	–	–	–	–	–
P3–P4	–	–	–	–	–	–
P5–P6	–	–	–	–	–	–
M1–M2	–	–	–	–	–	–
M3	–	–	–	–	–	–
K1–K2	.S..HN	WK25YM	**.S..MM**	**WK15CM**	.S..MM	WK15CM
K3	.S..MM	WK15PM	**.S..MM**	**WK15PM**	.S..MM	WK15PM
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–

M8090-F • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WK25YM			THM-F			WBK40U		
P	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K	1	420	**385**	340	325	**295**	260	965	**875**	780	145	**110**	90	1400	**800**	550
	2	335	**295**	275	250	**230**	210	760	**685**	635	150	**120**	85	1000	**665**	500
	3	280	**250**	230	210	**190**	175	640	**570**	520	155	**115**	70	100	**665**	500
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

NOTE: FIRST choice starting speeds are in ***bold*** *type.*
As the average chip thickness increases, the speed should be decreased.

M8090 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,16	**0,58**	0,94	0,12	**0,42**	0,68	0,09	**0,31**	0,51	0,08	**0,27**	0,44	0,07	**0,25**	0,41	.S..MM
.S..HN	0,12	**0,40**	0,81	0,08	**0,29**	0,59	0,06	**0,22**	0,44	0,06	**0,19**	0,38	0,05	**0,18**	0,35	.S..HN

NOTE: Use "Light Machining" value as starting feed rate.
For new applications, starting at a lighter feed rate is recommended.
% = ae/Dc X 100 (ae = radial depth of cut, Dc = cutting diameter)

M4070

M4070 Face Mill

The M4070 heavy-duty face mill has powerful features trusted to continuously perform in demanding machining conditions while running high cutting parameters on uneven, non-uniform surfaces.

Positive cutting edge geometry to enable smooth cutting.

Tangential design with a M6 insert clamping screw for secure insert seating and predictable performance in high depth of cut (DOC) applications.

Hardened anvils for extended tool body life.

Enlarged chip gash design for clean chip evacuation.

The M4070 heavy-duty face mill is equipped with hardened anvils and tangentially mounted inserts with four cutting edges (70°) to power through as forged and cast surfaces with uneven stock.

-MH

WK15CM

K

WK15CM is a wear-resistant grade with balanced toughness for general milling of cast irons. Best results in dry machining, but can also be used wet.

WP35CM

P M K S

WP35CM has a wide range of applications in general and rough milling of steels and cast iron. Performs best in dry, but can also be used under wet conditions.

RELIABILITY AND SECURITY WITH M4070

PRODUCT

SERIES

M4070

DIAMETER RANGE

125–315mm

SHANK TYPES

Shell Mills

INDUSTRY

GENERAL ENGINEERING

ENERGY

TRANSPORTATION

APPLICATIONS

FACE MILLING

RELIABILITY

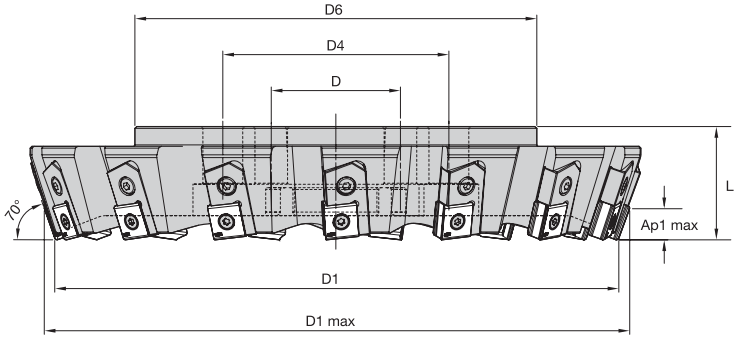
Hardened anvils to protect the cutter body from heavy-duty machining conditions.

SECURITY

Tangential design with an M6 insert clamping screw for secure insert seating.

TO TACKLE HEAVY-DUTY MACHINING CONDITIONS

M4070 • 70° • Shell Mills • Metric

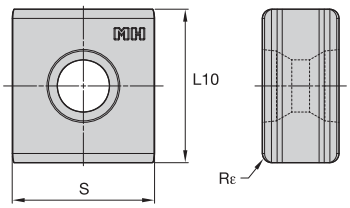


order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	coolant supply	kg
6318346	**M4070D125Z06S40LN20**	125	137,8	40	—	89	63	17,3	6	No	4,22
6317290	**M4070D160Z08S40LN20**	160	172,7	40	66,7	90	63	17,3	8	No	7,18
6524556	**M4070D200Z10S60LN20**	200	212,7	60	101,6	130	63	17,3	10	No	10,30
6524557	**M4070D250Z12S60LN20**	250	262,7	60	101,6	225	63	17,3	12	No	16,86
6524558	**M4070D315Z15S60LN20**	315	327,7	60	101,6	225	63	17,3	15	No	25,17

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M4070 • LNGX-MH



● first choice
○ alternate choice

P		●
M		●
K	●	○
N		
S		○
H		

ISO catalogue number	cutting edges	L10	S	Rε	hm	WK15CM	WP35CM
LNGU201012SNMH	4	20,00	10,00	1,20	0,07	6852417	6852418

M4070 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MH	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
P3–P4	.S..MH	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
P5–P6	.S..MH	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
M1–M2	.S..MH	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
M3	.S..MH	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
K1–K2	.S..MH	WK15CM	**.S..MH**	**WK15CM**	.S..MH	WK15CM
K3	.S..MH	WK15CM	**.S..MH**	**WK15CM**	.S..MH	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	.S..MH	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM

M4070 • Recommended Starting Speeds [m/min]

Material Group		WP35CM			WK15CM		
P	1	545	**475**	445	—	**–**	—
	2	335	**305**	275	—	**–**	—
	3	305	**275**	245	—	**–**	—
	4	230	**210**	190	—	**–**	—
	5	310	**275**	250	—	**–**	—
	6	190	**160**	110	—	**–**	—
M	1	245	**220**	185	—	**–**	—
	2	220	**190**	170	—	**–**	—
	3	175	**155**	140	—	**–**	—
K	1	355	**320**	290	505	**460**	410
	2	280	**250**	230	400	**355**	330
	3	235	**210**	190	335	**300**	275
N	1	—	**–**	—	—	**–**	—
	2	—	**–**	—	—	**–**	—
	3	—	**–**	—	—	**–**	—
S	1	—	**–**	—	—	**–**	—
	2	—	**–**	—	—	**–**	—
	3	—	**–**	—	—	**–**	—
	4	80	**60**	40	—	**–**	—
H	1	—	**–**	—	—	**–**	—
	2	—	**–**	—	—	**–**	—
	3	—	**–**	—	—	**–**	—

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M4070 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

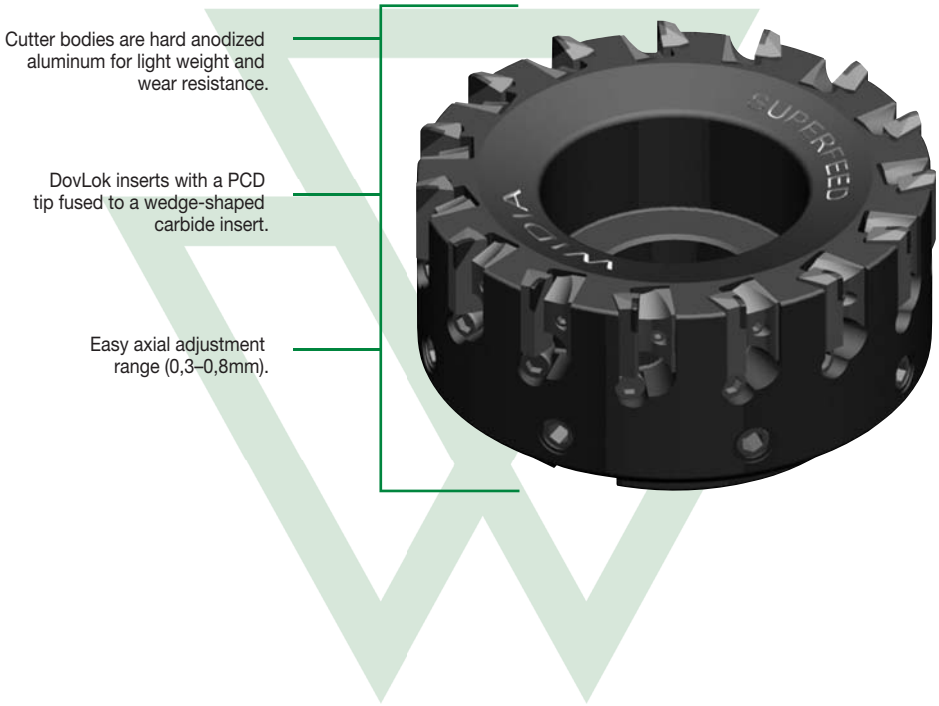
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MH	0,24	**0,62**	1,00	0,18	**0,45**	0,72	0,13	**0,34**	0,54	0,11	**0,29**	0,47	0,11	**0,27**	0,43	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.
For new applications, starting at a lighter feed rate is recommended.
% = ae/Dc X 100 (ae = radial depth of cut, Dc = cutting diameter)

widia.com

WIDIA™

The SuperFeed face mill is a PCD face mill for finish milling of non-ferrous materials.



INSERTS OFFERED IN GRADE WDN00U

EDR INSERT

For Shoulder Milling

N

Corner radii 0,8mm.
Axial DOC 6,35mm max.

SDR INSERT

For Face Milling

N

Corner radii 0,8mm
and 2,36mm.
Axial DOC 6,35mm max.

NON-FERROUS PCD FACE MILILNG

PRODUCT

SERIES

SuperFeed™

DIAMETER RANGE

63–200mm

SHANK TYPES

Shell Mills
Cylindrical End Mills

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

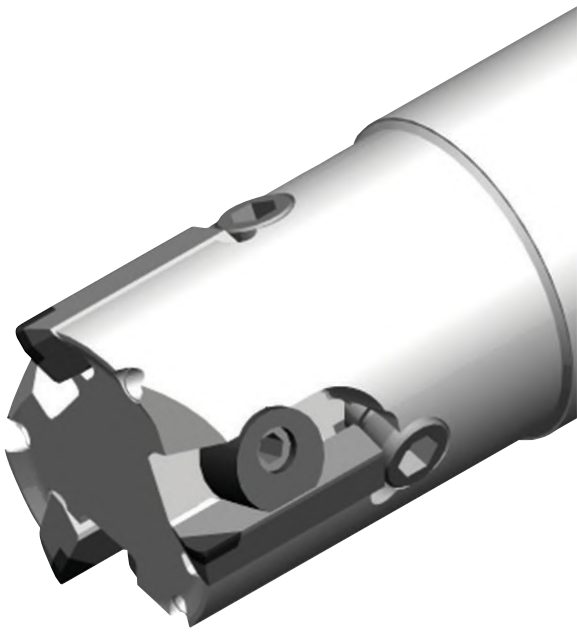
FACE MILLING

THROUGH COOLANT: RADIAL: INDEXABLE MILLING

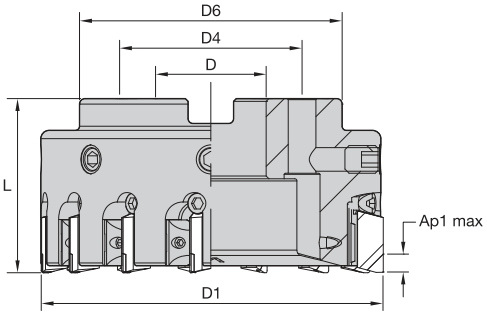
PCD

SIDE MILLING/ SHOULDER MILLING: SQUARE END

NON-FERROUS PCD



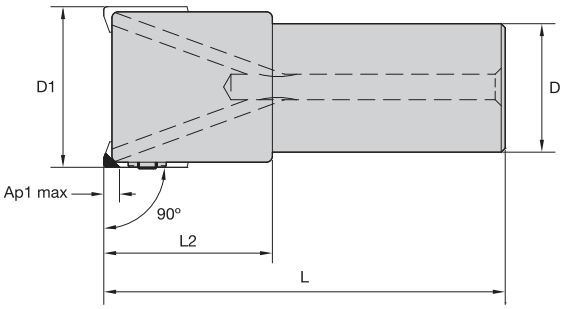
SuperFeed • Face Mills • Metric



order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	Z ADJ	kg	max RPM
5363208	**SF06306RH**	63	22	—	60	40	6	6	6	0,45	20000
5363209	**SF08008RH**	80	27	—	77	50	6	8	8	0,63	20000
5363220	**SF10012RH**	100	32	—	97	50	6	12	12	1,13	17320
5363221	**SF12515RH**	125	40	—	122	63	6	15	15	2,30	15500
5363222	**SF16018RH**	160	40	—	157	63	6	18	18	3,20	14150
5363223	**SF20024RH**	200	60	102	197	63	6	24	24	4,21	12240

NOTE: Z = Number of cartridges.
Z ADJ = Number of adjustable cartridges.
NOTE: Coolant cap or coolant shower plate must be ordered separately.

SuperFeed • End Mills • Metric



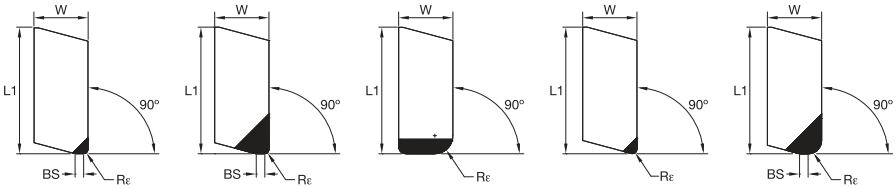
order number	catalogue number	D1	D	L2	L	Ap1 max	Z	Z ADJ	kg	max RPM
5363252	**WSSEM02502RH**	25	20	40	100	6,4	2	2	0,22	35800
5363253	**WSSEM03203RH**	32	32	42	100	6,4	3	3	0,54	31600
5363254	**WSSEM04004RH**	40	32	42	100	6,4	4	4	0,49	28300
5363255	**WSSEM05005RH**	50	32	42	100	6,4	5	5	0,79	25300

NOTE: Z = Number of cartridges.
Z ADJ = Number of adjustable cartridges.
NOTE: For setting procedure, see page A85.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

SuperFeed • PCD Inserts • Face Mills • SDR

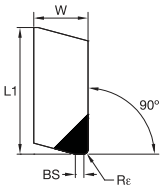


● first choice
○ alternate choice

catalogue number	cutting edges	L1	BS	W	Rε	hm	P	M	K	N	S	H	WDN00U
SDR100031E0NW	1	22,23	–	9,53	0,80	0,02				●			5358450
SDR100031E0W4	1	22,23	1,52	9,53	0,80	0,02							5358407
SDR100031E1W4	1	22,23	1,52	9,53	0,80	0,02							5358408
SDR100093E1W4	1	22,23	1,52	9,53	2,36	0,02							5358409
SDR102	1	22,22	–	9,52	3,17	0,02							5358451

NOTE: hm = Average chip thickness
BS = Wiper facet length

SuperFeed • PCD Inserts • End Mills • EDR



● first choice
○ alternate choice

catalogue number	cutting edges	L1	BS	W	Rε	hm	P	M	K	N	S	H	WDN00U
EDR100031E1W4	1	22,23	1,52	6,36	0,79	0,02				●			5358452

NOTE: hm = Average chip thickness
BS = Wiper facet length
E0 = 2,5 ap1 max
E1 = 6,3 ap1 max.

SuperFeed • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	–	–	–	–	–	–
P3–P4	–	–	–	–	–	–
P5–P6	–	–	–	–	–	–
M1–M2	–	–	–	–	–	–
M3	–	–	–	–	–	–
K1–K2	–	–	–	–	–	–
K3	–	–	–	–	–	–
N1–N2	SDR…/EDR…	WDN00U	**SDR…/EDR…**	**WDN00U**	SDR…/EDR…	WDN00U
N3	SDR…/EDR…	WDN00U	**SDR…/EDR…**	**WDN00U**	SDR…/EDR…	WDN00U
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	–	–	–	–	–	–

SuperFeed • Recommended Starting Speeds [m/min]

Material Group		WDN00U		
P	1	–	–	–
	2	–	–	–
	3	–	–	–
	4	–	–	–
	5	–	–	–
	6	–	–	–
M	1	–	–	–
	2	–	–	–
	3	–	–	–
K	1	–	–	–
	2	–	–	–
	3	–	–	–
N	1–2	910	**1980**	4880
	3	460	**610**	760
S	1	–	–	–
	2	–	–	–
	3	–	–	–
	4	–	–	–
H	1	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

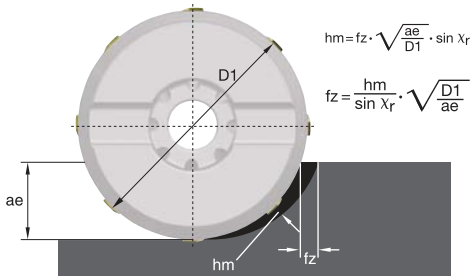
SuperFeed • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50–100%			
SDR…	0,08	0,17	0,33	0,06	0,13	0,25	0,06	0,11	0,22	0,05	0,10	0,20	0,05	0,10	0,20	SDR…
EDR…	0,08	0,17	0,33	0,06	0,13	0,25	0,06	0,11	0,22	0,05	0,10	0,20	0,05	0,10	0,20	EDR…

*NOTE: First choice starting feed (fz) is in **bold** type.*
Use corresponding speed (vc).
fz and vc are valid for ae ≥0,4 D1.
For smaller ae, fz and vc should be multiplied by the factor given below:

ae/D1 =	0,2	0,3	0,4
fz-Factor	1,5	1,3	1,0
vc-Factor	1,3	1,2	1,1



$$hm = fz \cdot \sqrt{\frac{ae}{D1}} \cdot \sin \chi_r$$

$$fz = \frac{hm}{\sin \chi_r} \cdot \sqrt{\frac{D1}{ae}}$$

Insert Setting and Fine Adjustment Procedure

General

- Non-contact gages are preferred.
- Contact gages can be used with the following precautions:
  - Indicator must be flat and parallel to the base.
  - Always approach the PCD cartridge from the relief angle under the PCD segment.
  - Do NOT let the indicator drop on the PCD segment.
- Remove all worn PCD cartridges.
- Clean the pockets of the cutter completely.

Face Mills

- Apply a small amount of lubricant to the following areas:
  - Pocket area where the wedge slides.
  - Threads of the cartridge locking screw.
  - Threads of the axial adjustment screw.
- Install cartridges applying light torque to the wedge assembly locking screw.
- Turn axial adjustment screw until the cartridge is 0,01–0,015mm below the final set height.
- Tighten the wedge assembly locking screw to 4 Nm.
- Turn the axial adjustment screw moving the PCD cartridge 0,005mm to the final set height position.
- Set all cartridges as above.

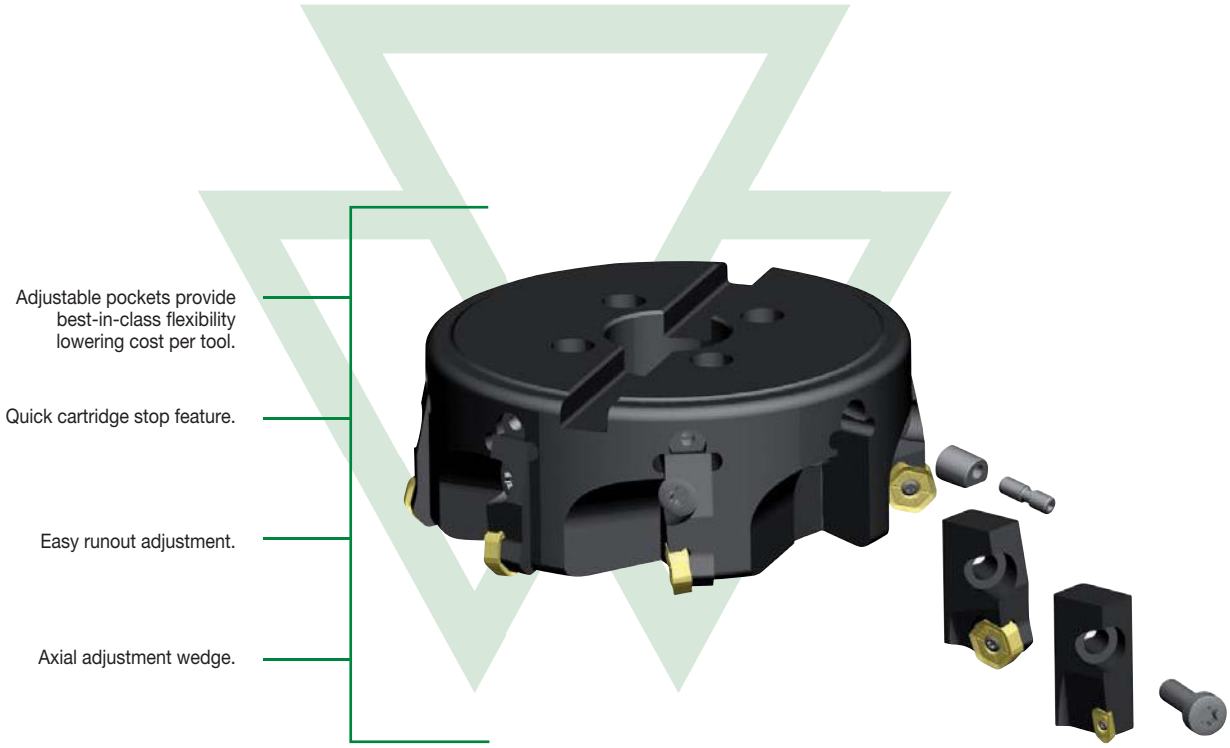
End Mills

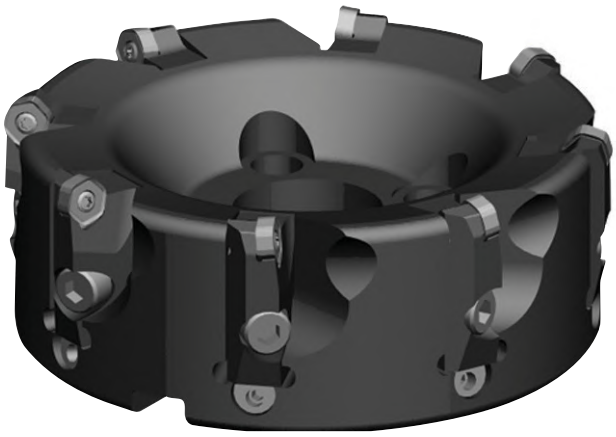
- Apply a small amount of lubricant to the following areas:
  - Threads of the cartridge locking screw.
  - Threads of the axial adjustment screw.
- Install cartridges applying light torque to the locking screws.
- Turn axial adjustment screw until the cartridge is 0,01–0,015mm below the final set height.
- Tighten the locking screw (left-hand threads) to 8 Nm leaving 0,005mm below the final set height.
- Turn the axial adjustment screw moving the PCD cartridge 0,005mm to the final set height position.
- Set all cartridges as above.

M4000

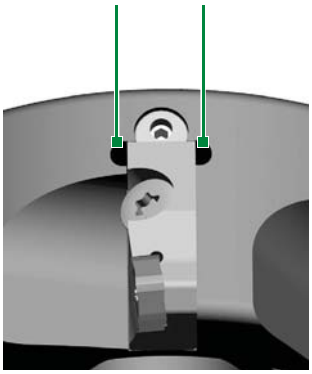
Cartridge Milling System

The M4000 cartridge milling system is a roughing and finishing solution with a single tool featuring easy-change cartridges with different insert styles and lead angles.





Quick cartridge stop — ready to go in a minute with no adjustment for roughing.



ROUGHING AND FINISHING

PRODUCT

SERIES

M4000

DIAMETER RANGE

125–315mm

SHANK TYPES

Face Mills

INDUSTRY

TRANSPORTATION

GENERAL ENGINEERING

APPLICATIONS

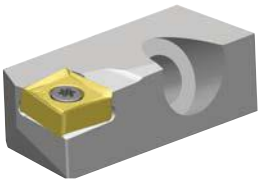
FACE MILLING

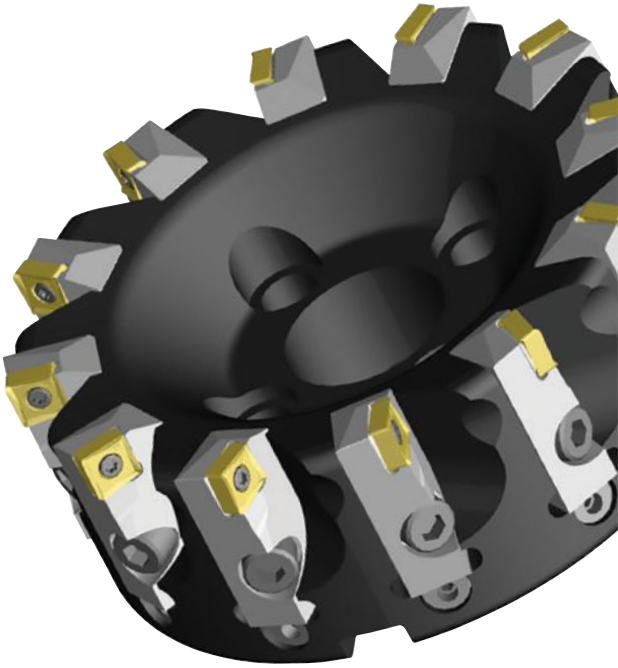
SIDE MILLING/ SHOULDER MILLING: SQUARE END

VSM890-12

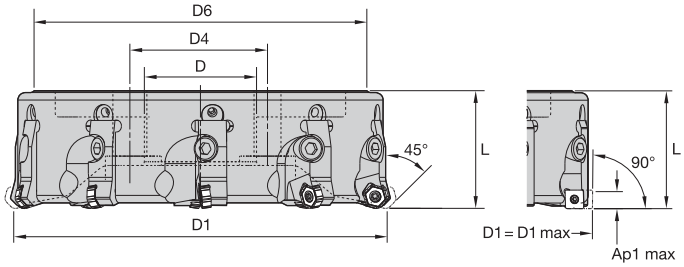
CARTRIDGE FOR M4000

M4000CA-SNHX12
Order code: 6602179





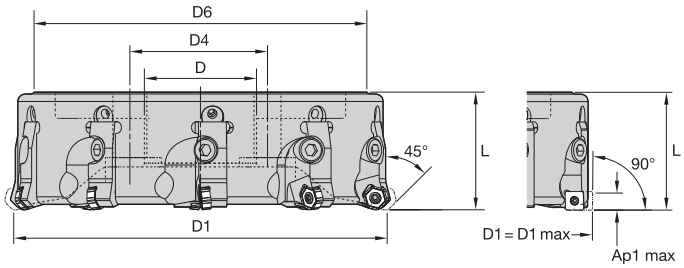
Face Mills • M4000 • Adjustable Cartridge Milling System Cutter Bodies • Metric



order number	catalogue number	D1	D	D4	D6	L	number of cartridges	max RPM	coolant supply	kg
4136343	M4000D125Z06ADJ	125	40	—	108	68,0	6	2000	No	3,34
4136344	M4000D125Z08ADJ	125	40	—	108	68,0	8	2000	No	3,51
4136345	M4000D160Z08ADJ	160	40	66,7	137	63,0	8	1800	No	5,19
4136346	M4000D160Z12ADJ	160	40	66,7	137	63,0	12	1800	No	5,20
4136347	M4000D200Z10ADJ	200	60	101,6	178	63,0	10	1500	No	8,02
4136348	M4000D200Z14ADJ	200	60	101,6	178	80,0	14	1500	No	12,57
4136349	M4000D250Z12ADJ	250	60	101,6	228	63,0	12	1200	No	13,53
4136350	M4000D250Z18ADJ	250	60	101,6	228	63,0	18	1200	No	13,90
4136351	M4000D315Z16ADJ	315	60	101,6	293	80,0	16	1000	No	25,08
4136352	M4000D315Z22ADJ	315	60	101,6	293	80,0	22	1000	No	25,42

** For all details regarding insert offering and cutting conditions, please refer to the master platforms.*

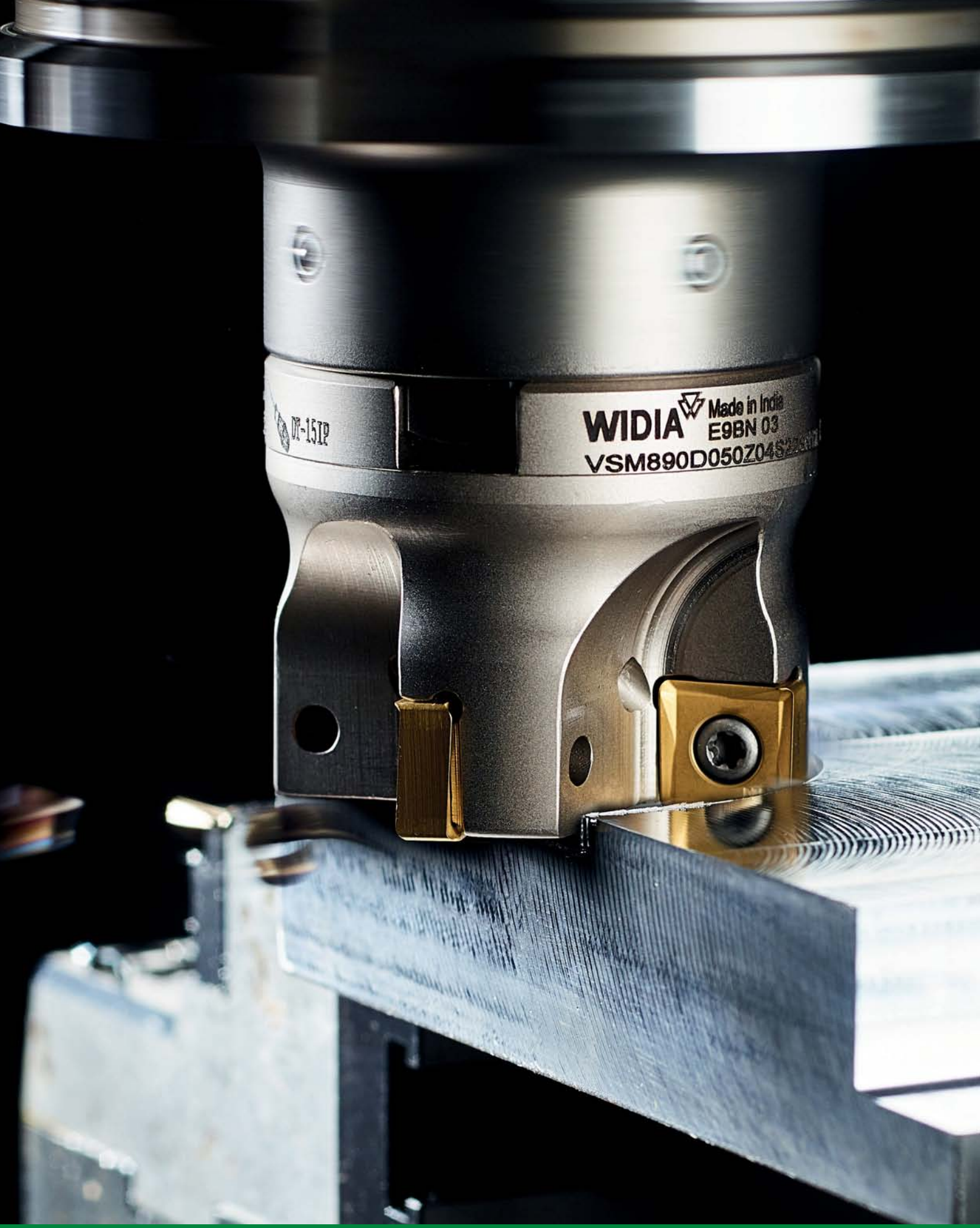
Face Mills • M4000 • Cartridge Milling System • Metric



order number	catalogue number	insert style	master platform *	Ap max
3968124	M4000CA-HN07	HN.J0704/XNGJ0704	M1200 Mini	3,5
4159018	M4000CA-HN07HD	HN.J0704	M1200 Mini	4,7
4159017	M4000CA-HN07HF	HN.J0704	M1200 Mini	1,0
3126691	M4000CA-HN09	HN.J0905/XNGJ0905	M1200	4,4
4159019	M4000CA-HN09HD	HN.J0905	M1200	6,0
2511344	M4000CA-HP06	HP.T06T3	M640	4,8
2006361	M4000CA-MDHX10	MDHX1004	M76	1,0
2006346	M4000CA-RC1606	RC.T1606	M100	8,0
2067492	M4000CA-SD1204	SDM.1204	M690	11,7
2006359	M4000CA-SD1506	SDM.1506	M690	14,9
2033495	M4000CA-SE1204	SE.N1204/SE.R1204	M68	6,0
2006377	M4000CA-SE1504	SE.N1504/SE.R1504	M68	8,0
2006348	M4000CA-SN12	SN.T1205/XNKT1205	M660	6,3
2006360	M4000CA-SN15	SN.T1505	M660	8,0
6602179	M4000CA-SNHX12	SNHX1204	VSM890-12	9,8
2006362	M4000CA-SP12	121358680	M40Wiper	9,0
2006373	M4000CA-SP1203	SP.N1203/SP.R1203	M40	9,0
2006376	M4000CA-SP1504	SP.N1504	M40	12,0
2033496	M4000CA-TP1603	TP.N1603/TP.R1603	M40	12,0
6152926	M4000CA-XDPT11	XDCT / XDET / XDPT / XDCW 1104	VSM11	11,5
6152927	M4000CA-XDPT17	XDCT / XDET / XDPT 1704	VSM17	15,9
6433216	M4000CA-XN10	XNPU / XNGU 1004	VSM490-10	10,0
6357989	M4000CA-XN15	XNPU / XNGU 15T6	VSM490-15	15,0
2006347	M4000CA-XP16	XP.T1604	M680	14,0

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.



widia.com

WIDIA™

The M25 chamfer mill is designed with body clearance for back-chamfer operations to perform on steel, stainless steel, and cast iron materials in countersinking and chamfering operations.

M25 chamfer mills are equipped with thick inserts and a body design with a large chip gash to efficiently evacuate chips from heavy-duty applications.

HEAVY-DUTY CHAMFER MILL FOR OF STEEL AND CAST IRON

PRODUCT

SERIES

M25™

DIAMETER RANGE

25–63mm

SHANK TYPES

Shell Mills
Weldon® End Mills

INDUSTRY

ENERGY

GENERAL ENGINEERING

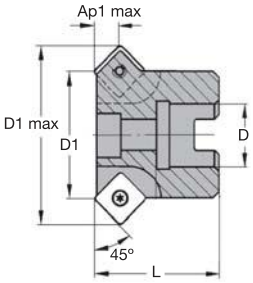
TRANSPORTATION

APPLICATIONS

COUNTER-SINKING/ STROKE CHAMFERING

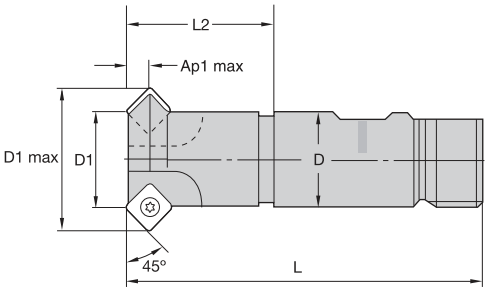
SIDE/ SHOULDER MILLING: EASED CHAMFER

M25 • Shell Mills SP1204 • Metric



order number	catalogue number	D1	D1 max	D	L	Ap1 max	Z	insert 1	coolant supply	kg
2022632	**12292511400**	50	66,7	22	40	8,3	4	SP..1204..	No	0,90
2022633	**12292511600**	63	79,7	22	40	8,3	5	SP..1204..	No	1,10

M25 • Weldon® Shank SD0903 • Metric

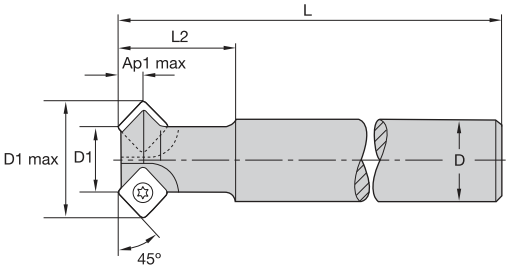


order number	catalogue number	D	D1	D1 max	L	L2	Ap1 max	Z	insert 1	coolant supply	kg
2022628	**12292510400**	16	16	28,8	75	27	6,4	2	SD..0903..	No	0,10
2022629	**12292510800**	25	25	37,8	96	40	6,4	2	SD..0903..	No	0,30
2022630	**12292511000**	32	32	44,8	100	40	6,4	3	SD..0903..	No	0,50

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

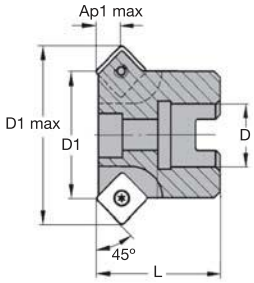
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M25 • Cylindrical Shank SD0903 • Metric



order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	insert 1	coolant supply	kg
2022634	**12292550400**	16	28,8	16	200	27	6,4	2	SD..0903..	No	0,40
2022635	**12292550800**	25	37,8	25	200	40	6,4	2	SD..0903..	No	0,70
2022636	**12292551000**	32	44,8	32	200	40	6,4	3	SD..0903..	No	1,20

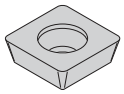
M25 • Shell Mills SD0903 • Metric

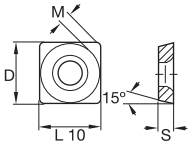


order number	catalogue number	D1	D1 max	D	L	Ap1 max	Z	insert 1	coolant supply	kg
2022631	**12292511200**	40	52,3	22	40	6,1	4	SD..0903..	No	0,80

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.

M25 • SDNT



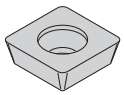


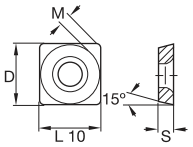
● first choice
○ alternate choice

	THM	THR	TTM08	TTM09	TTR	WK15CM	WP35CM
P			●	●	●		●
M					○		●
K	○	○				●	○
N	●	○					
S		○					○
H							

catalogue number	cutting edges	D	L10	M	S	hm	THM	THR	TTM08	TTM09	TTR	WK15CM	WP35CM
SDNT090308T	4	9,53	9,53	1,64	3,18	0,10	2028337	–	2028338	–	–	–	–
SDNT090308T	4	9,53	9,53	1,64	3,18	–	–	–	–	–	–	6724749	–
SDNT090308	4	9,53	9,53	1,64	3,18	–	–	–	–	–	–	–	6910858

M25 • SDMW



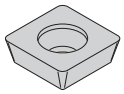


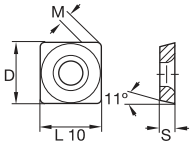
● first choice
○ alternate choice

	THM	THR	TTM08	TTM09	TTR	WK15CM	WP35CM
P			●	●	●		●
M					○		●
K	○	○				●	○
N	●	○					
S		○					○
H							

catalogue number	cutting edges	D	L10	M	S	hm	THM	THR	TTM08	TTM09	TTR	WK15CM	WP35CM
SDMW090308	4	9,53	9,53	1,64	3,18	0,08	–	–	–	–	–	–	6901197
SDMW090308	4	9,53	9,53	1,64	3,18	0,10	2028332	–	2028333	–	–	–	–

M25 • SPMW





● first choice
○ alternate choice

	THM	THR	TTM08	TTM09	TTR	WK15CM	WP35CM
P			●	●	●		●
M					○		●
K	○	○				●	○
N	●	○					
S		○					○
H							

catalogue number	cutting edges	D	L10	M	S	hm	THM	THR	TTM08	TTM09	TTR	WK15CM	WP35CM
SPMW120408	4	12,70	12,70	2,30	4,76	0,14	2014066	2028528	2028529	-	2024780	5427380	-

M25 • SD09 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	SDNT	WP35CM	**SDNT**	**WP35CM**	SDNT	WP35CM
P3–P4	SDNT	WP35CM	**SDNT**	**WP35CM**	SDNT	WP35CM
P5–P6	SDNT	WP35CM	**SDNT**	**WP35CM**	SDNT	WP35CM
M1–M2	SDNT	WP35CM	**SDNT**	**WP35CM**	SDNT	WP35CM
M3	SDNT	WP35CM	**SDNT**	**WP35CM**	SDNT	WP35CM
K1–K2	SDNT	WK15CM	**SDNT**	**WK15CM**	SDNT	WK15CM
K3	SDNT	WK15CM	**SDNT**	**WK15CM**	SDNT	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	–	–	**–**	**–**	–	–
H1	–	–	**–**	**–**	–	–

M25 • SP12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	SPMW	TTM09	**SPMW**	**TTM09**	SPMW	TTM09
P3–P4	SPMW	TTM09	**SPMW**	**TTM09**	SPMW	TTM09
P5–P6	SPMW	TTR	**SPMW**	**TTR**	SPMW	TTR
M1–M2	SPMW	TTR	**SPMW**	**TTR**	SPMW	TTR
M3	SPMW	TTR	**SPMW**	**TTR**	SPMW	TTR
K1–K2	SPMW	WK15CM	**SPMW**	**WK15CM**	SPMW	WK15CM
K3	SPMW	WK15CM	**SPMW**	**WK15CM**	SPMW	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	–	–	**–**	**–**	–	–
H1	–	–	**–**	**–**	–	–

M25 • Recommended Starting Speeds [m/min]

Material Group		THR			TTM08			TTM09			TTR			WP35CM			WK15CM			THM		
P	1	–	–	–	230	**200**	190	210	**180**	170	170	**150**	140	455	**395**	370	–	–	–	–	–	–
	2	–	–	–	195	**170**	140	175	**150**	125	105	**85**	75	280	**255**	230	–	–	–	–	–	–
	3	–	–	–	180	**150**	125	160	**130**	110	105	**85**	75	255	**230**	205	–	–	–	–	–	–
	4	–	–	–	160	**130**	105	140	**115**	90	85	**60**	55	190	**175**	160	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–	110	**85**	80	260	**230**	210	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–	50	**40**	35	160	**135**	110	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–	100	**60**	40	205	**185**	155	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	60	**35**	25	185	**160**	140	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	65	**40**	30	145	**130**	115	–	–	–	–	–	–
K	1	150	**135**	120	–	–	–	–	–	–	–	–	–	295	**265**	240	505	**460**	410	145	**110**	90
	2	185	**140**	120	–	–	–	–	–	–	–	–	–	235	**210**	190	400	**355**	330	150	**120**	85
	3	105	**75**	50	–	–	–	–	–	–	–	–	–	195	**175**	160	335	**300**	275	155	**115**	70
N	1	900	**600**	500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1080	**720**	600
	2	685	**465**	385	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	820	**560**	460
	3	450	**280**	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	540	**335**	240
S	1	35	**25**	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	25	**20**	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	50	**40**	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	35	**25**	18	–	–	–	–	–	–	–	–	–	66	**50**	33	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M25 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

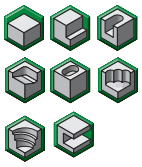
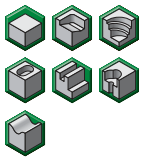
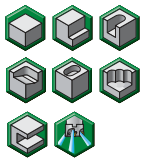
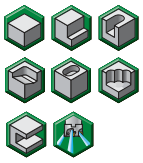
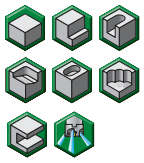
Recommended Starting Feeds [mm]

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)			Insert Geometry
SD09	0,10	**0,15**	0,30	SD09
SP12	0,10	**0,15**	0,35	SP12

NOTE: Use "Light Machining" value as starting feed rate.

Shoulder Milling Portfolio Overview

Product	VSM890™-12	VSM490™-15	VSM490™-10	VSM11™	VSM17™
Page	A144–A147	A136–A140	A128–A133	A102–A108	A112–A118
Victory™ – High-Performance	✓✓	✓✓	✓✓	✓✓	✓✓
Versatility	✓✓	✓	✓	✓✓	✓✓
Insert Style	Double-Sided	Double-Sided	Double-Sided	Single-Sided	Single-Sided
Pressed Inserts (PSTS)	○	◉	◉	◉	◉
Ground Inserts	◉	◉	◉	◉	◉
Cutting Edge	8	4	4	2	2
Corner Radii	0,8–1,6	0,4–2,0	0,4–1,6	0,2–2,4	0,4–6,0
Max Depth-of-Cut	9,8mm	15mm	10mm	11mm	16mm
Internal Coolant Supply	◉	◉	◉	◉	◉
Materials	P M K N S H	P M K N S	P M K N S	P M K N S	P M K N S
Achievable Surface Quality Wall	✓✓	✓✓	✓✓	✓✓	✓✓
Achievable Surface Quality Bottom	✓✓	✓✓	✓✓	✓✓	✓✓
Additional Opperations					
Shell Mills	40–250mm	40–125mm	40–125mm	40–125mm	40–160mm
Shank Mills – Cylindrical	–	25–32mm	16–32mm	12–32mm	25–40mm
Shank Mills – Weldon®	32mm	25–32mm	16–40mm	12–32mm	25–40mm
Screw-On	–	25–35mm	16–32mm	16–40mm	25–40mm
M4000 Cartridge	◉	◉	◉	◉	◉
Helical Mills	○	○	○	◉	◉

	VSM22™	VHSC	M680	M680+	M680-09	M690-12	M690-15
	★	★					
	A122–A123	A180–A181	A154–A160	A162–A163	A150–A152	A168–A172	A174–A176
	✓	✓✓	✓✓	✓	✓	✓	✓
	✓	✓✓	✓	✓	✓	✓	✓
	Single-Sided	Single-Sided	Single-Sided	Single-Sided	Single-Sided	Single-Sided	Single-Sided
	○	○	◉	○	○	○	○
	◉	◉	◉	◉	○	◉	◉
	2	2	2	2	2	4	4
	1,2	0,4–5	0,4–4,0	0,8	0,4–2,0	0,4–3,2	1,2–1,6
	20mm	16mm	14mm	9,5mm	9mm	10mm	12mm
	◉	◉	○	○	○	○	○
	P M K	N	P M K N S H	P M K N	P M K N	P M K N S H	P M K S H
	✓	✓✓	✓	✓	✓	✓	✓
	✓	✓✓	✓	✓	✓	✓	✓
							
	50–125mm	40–80mm	40–125mm	40mm	–	50–125mm	50–125mm
	–	25–32mm	–	–	16–32mm	–	–
	–	–	25–40mm	32mm	–	–	–
	–	–	25–40mm	25–32mm	–	–	–
	○	○	◉	◉	◉	○	◉
	○	○	◉	◉	○	◉	○

✓ Good	✓✓ Perfect	◉ Yes	○ No	★ All-Star Program

VSM Single-Sided Series

VSM 11™ Shoulder Mill

The VSM11 shoulder mill will thrive in precise machining to medium roughing applications. Its two-edged, single-sided inserts deliver low horsepower consumption and soft cutting action on a variety of workpieces.

Body:
Internal coolant supply.

Optimized chip gash for improved cutter stability and chip flow.

Insert:
Embedded wiper facet for great surface floor finish.

Multiple corner nose radii R0,20mm to R3,20mm available; includes uses for aerospace applications.

Super-positive rake design for soft cutting action and low machine power consumption.

The VSM11 shoulder mill is built for high DOC scenarios with Ap capabilities up to 11mm and a super-positive rake design for soft cutting action and low machine power consumption.

Six insert geometries are available to apply in a variety of applications and materials.

GEOMETRIES FOR ALL MATERIAL GROUPS IN SHOULDER MILLING APPLICATIONS

-ALP

N

Roughing and finishing of aluminum alloys. High precision. Periphery ground.

-ML

P M S H

Light machining and finishing. First choice for stainless steel and titanium. Periphery ground.

-MM

P M K S H

Medium machining. First choice for general purpose. Precision pressed to size.

-MH

P M K S

First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

-MU

P M K N S

First choice for low to medium cutting parameters. Precision pressed to size and periphery ground.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

LOW POWER CONSUMPTION, HIGH DEPTH OF CUT

PRODUCT

SERIES

VSM11™

DIAMETER RANGE

Screw on: 16–40mm
Weldon: 12–32mm
Cylindrical: 12–32mm
Shell: 40–125mm
Helical: 25–50mm

SHANK TYPES

Screw-On End Mills
Weldon® End Mills
Cylindrical End Mills
Shell Mills
Helical End Mills

INDUSTRY

TRANSPORTATION
GENERAL ENGINEERING
AEROSPACE

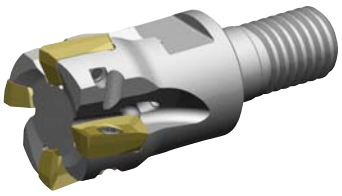
APPLICATIONS

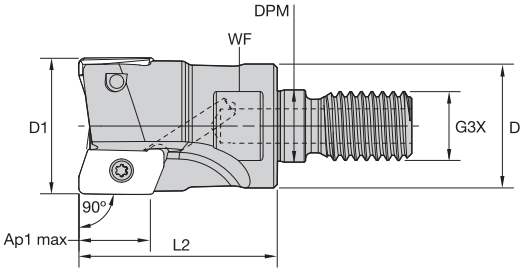
SIDE MILLING/ SHOULDER MILLING: SQUARE END | SLOTTING: SQUARE END | FACE MILLING | RAMPING | POCKETING | PLUNGE MILLING | HELICAL INTERPOLATION/ POCKET MILLING | 3D PROFILING | SIDE MILLING/ SHOULDER MILLING: BOTTOM SHOULDERING

LOW POWER CONSUMPTION

SINGLE-SIDED INSERTS

VSM11™ • Screw-On End Mills • Metric

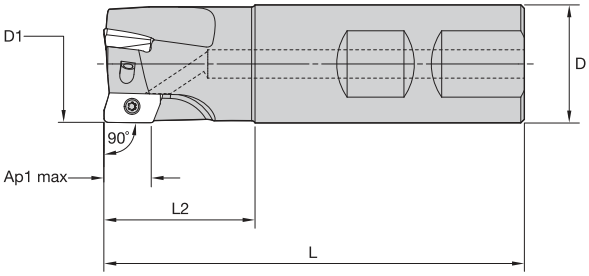




order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5417011	VSM11D016Z02M08XD11	16	13	8,5	M8	25	10	11,5	2	10.0°	41400	Yes	0,02
5417013	VSM11D020Z03M10XD11	20	18	10,5	M10	28	15	11,6	3	7.8°	35100	Yes	0,05
5417015	VSM11D025Z04M12XD11	25	21	12,5	M12	32	17	11,5	4	5.3°	30200	Yes	0,08
5417017	VSM11D032Z04M16XD11	32	29	17,0	M16	40	24	11,4	4	3.6°	25800	Yes	0,18
5417019	VSM11D040Z06M16XD11	40	29	17,0	M16	40	24	11,4	6	2.6°	22600	Yes	0,24

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page A114.

VSM11 • Weldon® End Mills • Metric



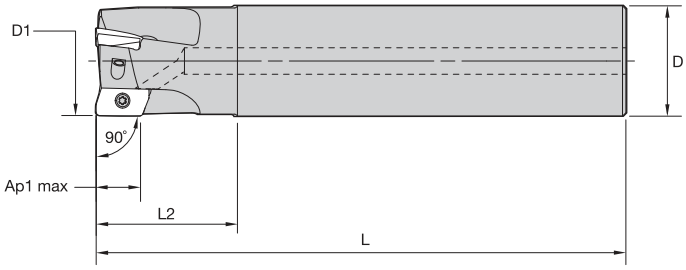
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416454	VSM11D012Z01B16XD11	12	16	70	21	11,7	1	3.7°	53100	Yes	0,08
6616467	VSM11D016Z02B12XD11	16	12	67	21	11,5	2	10.0°	41400	Yes	0,05
5416455	VSM11D016Z02B16XD11	16	16	70	21	11,5	2	10.0°	41400	Yes	0,09
6171449	VSM11D018Z02B16XD11	18	16	70	21	11,6	2	—	39000	Yes	0,09
6616468	VSM11D020Z03B16XD11	20	16	79	30	11,6	3	7.8°	35100	Yes	0,11
5416457	VSM11D020Z02B20XD11	20	20	81	30	11,6	2	7.8°	35100	Yes	0,15
5416458	VSM11D020Z03B20XD11	20	20	81	30	11,6	3	7.8°	35100	Yes	0,16
6171501	VSM11D022Z03B20XD11	22	20	81	30	11,5	3	—	33460	Yes	0,17
6616469	VSM11D025Z03B20XD11	25	20	82	31	11,5	3	5.3°	30200	Yes	0,18
5416459	VSM11D025Z03B25XD11	25	25	88	31	11,5	3	5.3°	30200	Yes	0,27
5416480	VSM11D025Z04B25XD11	25	25	88	31	11,5	4	5.3°	30200	Yes	0,28
5416481	VSM11D030Z04B25XD11	30	25	88	31	11,5	4	3.2°	26900	Yes	0,30
6616470	VSM11D032Z04B25XD11	32	25	96	40	11,4	4	3.6°	25800	Yes	0,35
6616481	VSM11D032Z05B25XD11	32	25	96	39	11,4	5	3.6°	25800	Yes	0,36
5416482	VSM11D032Z04B32XD11	32	32	100	39	11,4	4	3.6°	25800	Yes	0,51
5416483	VSM11D032Z05B32XD11	32	32	100	39	11,4	5	3.6°	25800	Yes	0,52

NOTE: Weldon type not recommended for finishing operations.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

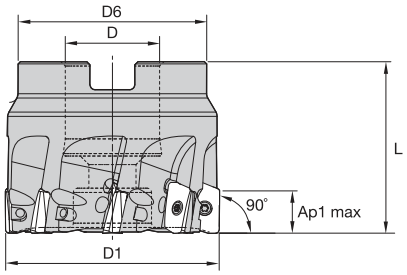
VSM11™ • Cylindrical End Mills • Metric



order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416632	VSM11D012Z01A16XD11L100	12	16	100	25	11,7	1	3.7°	53100	Yes	0,13
6164360	VSM11D016Z02A12XD11L100	16	12	100	31	11,5	2	—	41400	Yes	0,08
5416633	VSM11D016Z02A16XD11L100	16	16	100	31	11,5	2	10.0°	41400	Yes	0,12
5416700	VSM11D016Z02A16XD11L170	16	16	170	25	11,5	2	10.0°	41400	Yes	0,23
6171450	VSM11D018Z02A16XD11L100	18	16	100	31	11,6	2	—	39000	Yes	0,13
5416701	VSM11D018Z02A16XD11L170	18	16	170	25	11,6	2	9.7°	37900	Yes	0,23
5416634	VSM11D020Z02A20XD11L110	20	20	110	31	11,6	2	7.8°	35100	Yes	0,22
5416702	VSM11D020Z02A20XD11L170	20	20	170	41	11,6	2	7.8°	35100	Yes	0,35
5416635	VSM11D020Z03A20XD11L110	20	20	110	31	11,6	3	7.8°	35100	Yes	0,23
5416703	VSM11D020Z03A20XD11L170	20	20	170	41	11,6	3	7.8°	35100	Yes	0,36
6171502	VSM11D022Z03A20XD11L110	22	20	110	31	11,5	3	—	33460	Yes	0,24
5416704	VSM11D022Z03A20XD11L170	22	20	170	30	11,5	3	6.6°	32900	Yes	0,37
5416636	VSM11D025Z03A25XD11L120	25	25	120	33	11,5	3	5.3°	30200	Yes	0,39
5416705	VSM11D025Z03A25XD11L210	25	25	210	50	11,5	3	5.3°	30200	Yes	0,70
5416637	VSM11D025Z04A25XD11L120	25	25	120	33	11,5	4	5.3°	30200	Yes	0,40
5416706	VSM11D025Z04A25XD11L210	25	25	210	50	11,5	4	5.3°	30200	Yes	0,72
6171503	VSM11D032Z03A25XD11L130	32	25	130	41	11,4	3	—	25800	Yes	0,37
5416638	VSM11D032Z03A32XD11L130	32	32	130	41	11,4	3	3.6°	25800	Yes	0,70
5416707	VSM11D032Z03A32XD11L250	32	32	250	65	11,4	3	3.6°	25800	Yes	1,39
5416639	VSM11D032Z05A32XD11L130	32	32	130	41	11,4	5	3.6°	25800	Yes	0,71

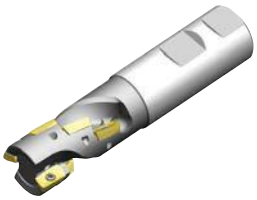
NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page A114.

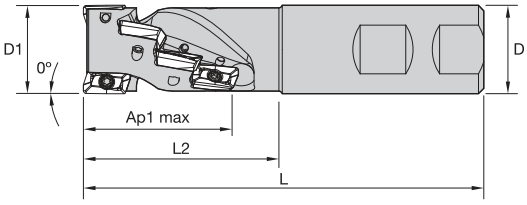
VSM11 • Shell Mills • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416316	VSM11D040Z04S016XD11	40	16	37	40	11,4	4	2.6°	22600	Yes	0,22
5416317	VSM11D040Z06S016XD11	40	16	37	40	11,4	6	2.6°	22600	Yes	0,22
5416318	VSM11D050Z05S022XD11	50	22	44	40	11,3	5	1.9°	19900	Yes	0,33
5416319	VSM11D050Z08S022XD11	50	22	44	40	11,3	8	1.9°	19900	Yes	0,33
5416340	VSM11D063Z06S022XD11	63	22	44	40	11,3	6	1.5°	17500	Yes	0,50
5416341	VSM11D063Z09S022XD11	63	22	44	40	11,3	9	1.5°	17500	Yes	0,52
5416342	VSM11D080Z08S027XD11	80	27	60	50	11,3	8	1.1°	15300	Yes	1,14
5416345	VSM11D100Z09S032XD11	100	32	80	50	11,3	9	.9°	13600	Yes	1,79
5416347	VSM11D125Z011S040XD11	125	40	80	63	11,3	11	.7°	12100	Yes	3,01

VSM11™ • Helical End Mills with Weldon® Shank • Metric

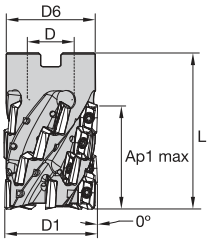




order number	catalogue number	D1	D	L	L2	Ap1 max	Z	Z U	max ramp angle	max RPM	coolant supply	kg
6738387	VSM11H025Z02B25XD11	25	25	113	56	43,1	8	2	3.2	30000	Yes	0,3
6738389	VSM11H032Z03B32XD11	32	32	117	56	42,7	12	3	3.2	26500	Yes	0,6
6738411	VSM11H032Z04B32XD11	32	32	117	56	42,2	16	4	4.5	26500	Yes	0,6

NOTE: Z = number of pockets; ZU = number of flutes.

VSM11 • Helical Shell Mills • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	max RPM	coolant supply	kg
6738412	VSM11H040Z04S016XD11	40	16	37	60	42,3	16	4	2.4	22100	Yes	0,3
6738413	VSM11H040Z05S016XD11	40	16	37	60	42,7	20	5	2.4	22100	Yes	0,3
6738414	VSM11H050Z04S022XD11	50	22	44	70	51,6	20	4	1.8	19800	Yes	0,6
6738415	VSM11H050Z06S022XD11	50	22	44	70	51,6	30	6	1.8	19800	Yes	0,6

NOTE: Z = number of pockets; ZU = number of flutes.

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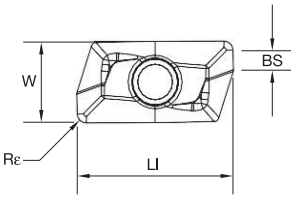
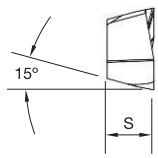
VSM11™ • XDCT-ALP



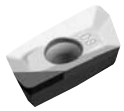


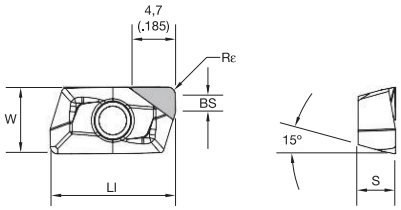
● first choice
○ alternate choice

P							●	●	●	○	●	●	●			
M							●	●	●	●	●	●	●			
K			●	●			○	○				○				
N		●			●	●					○	○				
S							●	○	○	●	●	○	●			
H							○			○		○				

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDCT110402PDFRALP	2	13,42	2,29	4,00	6,90	0,20	–	-	-	-	6407444	6407445	-	-	-	-	-	-	-
XDCT110404PDFRALP	2	13,43	2,09	4,00	6,90	0,40	0,02	-	-	-	5933940	5417054	-	-	-	-	-	-	-
XDCT110408PDFRALP	2	13,44	1,69	4,00	6,90	0,80	0,02	-	-	-	5936171	5417053	-	-	-	-	-	-	-
XDCT110412PDFRALP	2	13,44	1,29	4,00	6,90	1,20	0,02	-	-	-	6055634	6055635	-	-	-	-	-	-	-
XDCT110416PDFRALP	2	13,44	0,88	4,00	6,89	1,60	0,02	-	-	-	6055598	6055599	-	-	-	-	-	-	-
XDCT110420PDFRALP	2	13,44	0,49	4,00	6,89	2,00	–	-	-	-	6407446	6407447	-	-	-	-	-	-	-
XDCT110424PDFRALP	2	13,44	0,16	4,00	6,88	2,40	0,02	-	-	-	6055600	6055631	-	-	-	-	-	-	-
XDCT110432PDFRALP	2	12,86	–	4,00	6,89	3,20	0,02	-	-	-	6055632	6055633	-	-	-	-	-	-	-

VSM11™ • XDCW-PCD



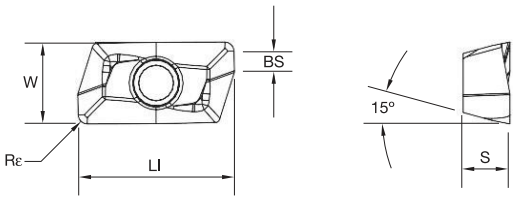


● first choice
○ alternate choice

P							●	●	●	○	●	●	●
M							●	●	●	●	●	●	●
K			●	●			○	○				○	
N		●			●	●					○	○	
S							●	○	○	●	●	○	●
H							○			○		○	

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDCW110404PDFRPCD	1	13,41	2,22	4,00	6,90	0,40	0,02	5415420	-	-	-	-	-	-	-	-	-	-	-
XDCW110408PDFRPCD	1	13,42	1,80	4,00	6,90	0,80	0,02	5415421	-	-	-	-	-	-	-	-	-	-	-

VSM11 • XDCT-ML

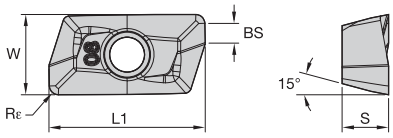


● first choice
○ alternate choice

P							●	●	●	○	●	●	●
M							●	●	●	●	●	●	●
K			●	●			○	○				○	
N		●			●	●					○	○	
S							●	○	○	●	●	○	●
H							○			○		○	

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDCT110404PDERML	2	13,43	2,09	4,00	6,90	0,40	0,04	-	-	6242456	-	-	5536671	5536670	5642230	-	6180174	-	-
XDCT110408PDERML	2	13,44	1,69	4,00	6,90	0,80	0,04	-	5415549	6242457	-	-	5415548	5415547	5545065	5517826	6180173	-	5415546
XDCT110412PDERML	2	13,44	1,29	4,00	6,90	1,20	—	-	-	-	-	-	6408003	-	-	-	6408002	-	-
XDCT110416PDERML	2	13,44	0,88	4,00	6,89	1,60	0,04	-	-	-	-	-	5964861	-	5964810	-	6408004	-	-
XDCT110424PDERML	2	13,44	0,16	4,00	6,88	2,40	—	-	-	-	-	-	-	-	-	-	6408006	-	-
XDCT110432PDERML	2	12,86	—	4,00	6,89	3,20	—	-	-	-	-	-	-	-	-	-	6408007	-	-

VSM11™ • XDET-MU

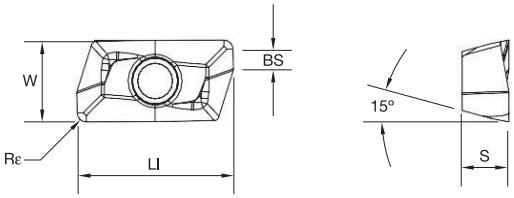


● first choice
○ alternate choice

P								●	●	●	○	●	●	●					
M								●	●	●	●	●	●	●					
K			●	●				○	○				○						
N		●			●	●						○	○						
S								●	○	○	●	●	○	●					
H								○			○		○						

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDET110404PDERMU	2	13,43	2,09	4,00	6,90	0,40	0,04	-	-	-	-	-	-	-	-	-	-	6862949	-
XDET110408PDERMU	2	13,44	1,69	4,00	6,90	0,80	0,04	-	-	-	-	-	-	-	-	-	-	6862946	-

VSM11 • XDPT-MM

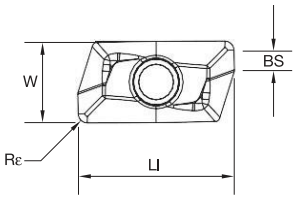


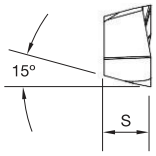
● first choice
○ alternate choice

P								●	●	●	○	●	●	●					
M								●	●	●	●	●	●	●					
K			●	●				○	○				○						
N		●			●	●						○	○						
S								●	○	○	●	●	○	●					
H								○			○		○						

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDPT110404PDSRMM	2	13,49	2,06	4,13	6,94	0,39	0,06	-	5415428	6242458	-	-	5642237	5415450	5642231	-	6180149	-	-
XDPT110408PDSRMM	2	13,50	1,66	4,13	6,90	0,78	0,06	-	5415315	6242459	-	-	5415319	5415318	5545063	5519921	6180148	-	5415317
XDPT110412PDSRMM	2	13,44	1,29	4,00	6,90	1,20	0,06	-	5415310	-	-	-	5415314	5415313	5642232	-	6180150	-	5415312
XDPT110416PDSRMM	2	13,51	0,85	4,13	6,95	1,60	0,06	-	5415250	-	-	-	5415254	5415253	5642233	-	6180172	-	-
XDPT110420PDSRMM	2	13,51	0,45	4,13	6,94	2,00	0,06	-	-	-	-	-	5980399	5980400	5980398	-	6408095	-	-
XDPT110424PDSRMM	2	13,37	–	4,01	6,94	2,40	0,06	-	-	-	-	-	5901355	-	5901354	-	6408096	-	-
XDPT110431PDSRMM	2	12,94	–	4,01	6,94	3,10	0,06	-	5415422	-	-	-	5415426	5415425	5642234	5517827	6279204	-	-

VSM11 • XDPT-MH



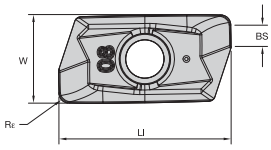


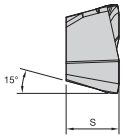
● first choice
○ alternate choice

	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
P						●	●	●	○	●	●	●
M						●	●	●	●	●	●	●
K		●	●			○	○				○	
N	●			●	●					○	○	
S						●	○	○	●	●	○	●
H						○			○		○	

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDPT110408PDSRMH	2	13,44	1,68	4,00	6,90	0,79	0,13	-	5415255	-	-	-	-	5415257	5545064	-	6408098	-	5415256
XDPT110412PDSRMH	2	13,44	1,29	4,00	6,90	1,20	0,13	-	5415360	-	-	-	-	5415362	5642235	-	6408099	-	-
XDPT110416PDSRMH	2	13,44	0,90	4,00	6,90	1,59	0,13	-	5415364	-	-	-	-	5415366	5642236	-	6408100	-	-

VSM11 • XDPT-MU





● first choice
○ alternate choice

	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
P						●	●	●	○	●	●	●
M						●	●	●	●	●	●	●
K		●	●			○	○				○	
N	●			●	●					○	○	
S						●	○	○	●	●	○	●
H						○			○		○	

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU20PM	WU35PM
XDPT110408PDSRMU	2	13,50	1,66	4,13	6,94	0,80	0,06	-	-	-	-	-	-	-	-	-	-	6487443	-
XDPT110416PDSRMU	2	13,51	0,85	4,13	6,95	1,60	0,06	-	-	-	-	-	-	-	-	-	-	6862948	-

VSM11 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Universal		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	XDCT-ML	WP40PM	**XDPT-MM**	**WP40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP40PM
P3–P4	XDCT-ML	WP40PM	**XDPT-MM**	**WP40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP40PM
P5–P6	XDPT-MM	WP25PM	**XDPT-MM**	**WP35CM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP40PM
M1–M2	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WS40PM
M3	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WS40PM
K1–K2	XDCT-ML	WK15CM	**XDPT-MM**	**WK15CM**	**XD..-MU**	**WU20PM**	XDPT-MH	WK15CM
K3	XDCT-ML	WP35CM	**XDPT-MM**	**WP35CM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP35CM
N1–N2	XDCT-ALP	WN10HM	**XDCT-ALP**	**WN25PM**	**–**	**–**	XDCT-ALP	WN25PM
N3	XDCW-PCD	WDN10U	**XDCW-PCD**	**WDN10U**	**–**	**–**	XDCW-PCD	WDN10U
S1–S2	XDCT-ML	WP25PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WS40PM
S3	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WS40PM
S4	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WS40PM
H1	XDCT-ML	WP25PM	**XDPT-MM**	**WP25PM**	**XD..-MU**	**WU20PM**	XDPT-MU	WU20PM

NOTE: Use XDCT/XDET for precision.

VSM11™ • Recommended Starting Speeds [m/min]

Material Group		WDN10U			WK15CM			WK15PM			WN10HM			WN25PM			WP25PM		
P	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	330	**285**	270
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	275	**240**	200
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	255	**215**	175
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	225	**185**	150
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	185	**170**	150
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	165	**125**	100
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	205	**180**	165
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	185	**160**	130
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	140	**120**	95
K	1	–	–	–	420	**385**	340	270	**245**	215	–	–	–	–	–	–	230	**205**	185
	2	–	–	–	335	**295**	275	210	**190**	175	–	–	–	–	–	–	180	**160**	150
	3	–	–	–	280	**250**	230	175	**160**	145	–	–	–	–	–	–	150	**135**	120
N	1	4010	**3505**	2990	–	–	–	–	–	–	795	**695**	600	1075	**945**	875	–	–	–
	2	1600	**1495**	1400	–	–	–	–	–	–	795	**695**	600	945	**875**	760	–	–	–
	3	1600	**1495**	1400	–	–	–	–	–	–	560	**485**	420	945	**875**	760	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**35**	25
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**35**	25
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	25
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	70	**50**	35
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	120	**90**	70

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU20PM			WU35PM		
P	1	455	**395**	370	295	**260**	245	–	–	–	–	–	–	330	**290**	270	260	**230**	215
	2	280	**255**	230	250	**215**	180	–	–	–	–	–	–	275	**250**	200	220	**190**	160
	3	255	**230**	205	230	**195**	160	–	–	–	–	–	–	255	**220**	175	200	**170**	140
	4	190	**175**	160	205	**170**	135	–	–	–	–	–	–	225	**190**	150	180	**150**	120
	5	260	**230**	210	170	**155**	135	–	–	–	170	**145**	120	185	**175**	150	150	**135**	120
	6	160	**135**	110	150	**115**	90	–	–	–	150	**110**	80	165	**130**	100	130	**100**	80
M	1	205	**185**	155	195	**170**	155	225	**200**	185	210	**170**	140	205	**180**	165	170	**150**	135
	2	185	**160**	140	175	**150**	125	205	**180**	145	180	**145**	120	185	**160**	130	155	**130**	110
	3	145	**130**	115	130	**115**	90	155	**135**	105	145	**110**	85	140	**120**	95	115	**100**	80
K	1	295	**265**	240	–	–	–	–	–	–	–	–	–	250	**220**	185	–	–	–
	2	235	**210**	190	–	–	–	–	–	–	–	–	–	200	**180**	150	–	–	–
	3	195	**175**	160	–	–	–	–	–	–	–	–	–	180	**150**	120	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	400	**350**	300	–	–	–
S	1	–	–	–	–	–	–	45	**40**	30	40	**35**	25	40	**35**	25	35	**30**	25
	2	–	–	–	–	–	–	45	**40**	30	40	**35**	25	40	**35**	25	35	**30**	25
	3	–	–	–	–	–	–	55	**45**	30	50	**40**	25	50	**40**	25	45	**35**	25
	4	–	–	–	–	–	–	70	**60**	40	60	**50**	30	70	**50**	35	60	**45**	30
H	1	–	–	–	–	–	–	–	–	–	–	–	–	110	**80**	70	–	–	–

NOTE: FIRST choice starting speeds are in **bold** *type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VSM11 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..PCD	0,12	**0,18**	0,29	0,08	**0,13**	0,21	0,06	**0,10**	0,16	0,06	**0,09**	0,14	0,05	**0,08**	0,12	.F..PCD
.F..ALP	0,12	**0,22**	0,31	0,08	**0,16**	0,23	0,06	**0,12**	0,17	0,06	**0,10**	0,15	0,05	**0,10**	0,14	.F..ALP
.E..ML	0,17	**0,27**	0,36	0,13	**0,20**	0,26	0,10	**0,15**	0,19	0,08	**0,13**	0,17	0,08	**0,12**	0,16	.E..ML
.S..MM/.S..MU	0,23	**0,32**	0,47	0,17	**0,23**	0,34	0,13	**0,17**	0,25	0,11	**0,15**	0,22	0,10	**0,14**	0,20	.S..MM/.S..MU
.S..MH	0,23	**0,37**	0,56	0,17	**0,27**	0,40	0,13	**0,20**	0,30	0,11	**0,17**	0,26	0,10	**0,16**	0,24	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.

VSM Single-Sided Series

VSM17™ Shoulder Mill

The VSM17 shoulder mill will thrive in precise machining to medium roughing applications. Its two-edged, single-sided inserts deliver low horsepower consumption and soft cutting action on a variety of workpieces.

Body:
Internal coolant supply.

Optimized chip gash for improved cutter stability and chip flow.

Insert:
Embedded wiper facet for great surface floor finish.

Multiple corner nose radii R0,40mm to R6mm available; includes uses for aerospace applications.

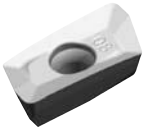
Super-positive rake design for soft cutting action and low machine power consumption.

The VSM17 shoulder mill is built for high DOC scenarios with Ap capabilities up to 16mm and a super-positive rake design for soft cutting action and low machine power consumption.

Six insert geometries are available to apply in a variety of applications and materials.

GEOMETRIES FOR ALL MATERIAL GROUPS IN SHOULDER MILLING APPLICATIONS

-ALP



N

Roughing and finishing of aluminum alloys. High precision. Periphery ground.

-ML

P M S H

Light machining and finishing. First choice for stainless steel and titanium. Periphery ground.

-MM

P M K S H

Medium machining. First choice for general purpose. Precision pressed to size.

-MH

P M K S

First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

-MU

P M K N S

First choice for low to medium cutting parameters. Precision pressed to size and periphery ground.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

LOW POWER CONSUMPTION, HIGH DEPTH OF CUT

PRODUCT

SERIES

VSM17™

DIAMETER RANGE

Screw-On End Mills: 25–40mm
Weldon End Mills: 25–40mm
Cylindrical End Mills: 25–40mm
Shell Mills: 40–125mm
Helical End Mills: 50–80mm

SHANK TYPES

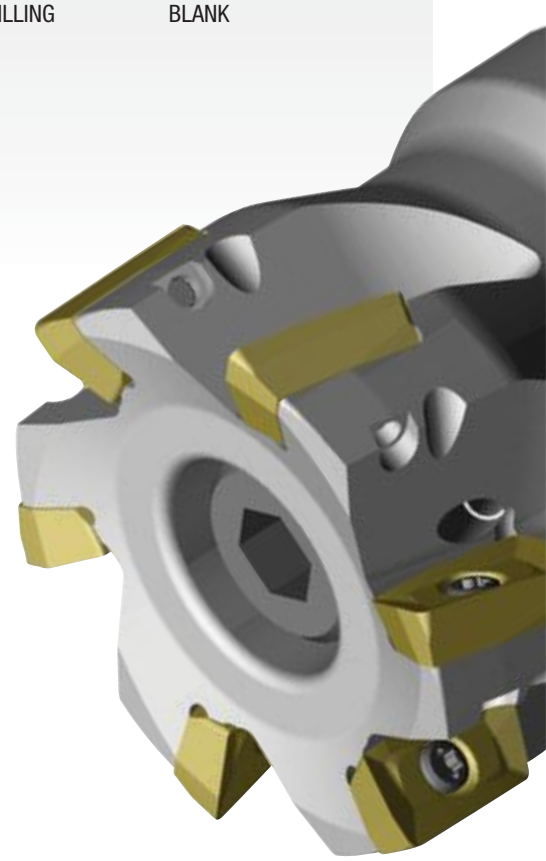
Screw-On End Mills
Weldon® End Mills
Cylindrical End Mills
Shell Mills
Helical End Mills

INDUSTRY

TRANSPORTATION
GENERAL ENGINEERING
AEROSPACE

APPLICATIONS

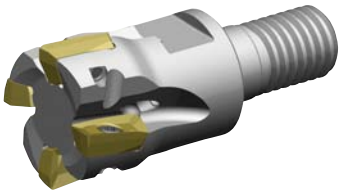
SIDE MILLING/ SHOULDER MILLING: SQUARE END
SIDE MILLING/ SHOULDER MILLING: BOTTOM SHOULDERING
SLOTTING: SQUARE END
SLOTTING SIDE
FACE MILLING
RAMPING BLANK
HELICAL INTERPOLATION/ POCKET MILLING
3D PROFILING
POCKETING
PLUNGE MILLING

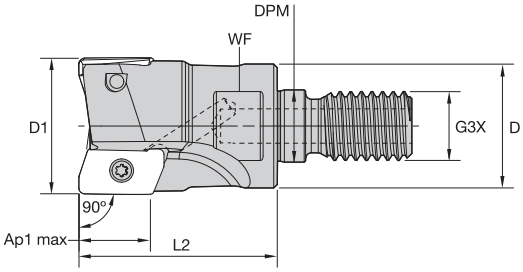


LOW POWER CONSUMPTION

SINGLE-SIDED INSERTS

VSM17™ • Screw-On End Mills • Metric

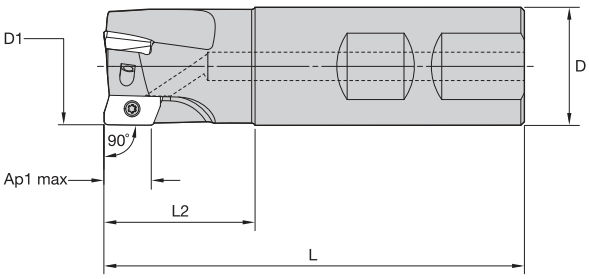




order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988091	VSM17D025Z02M12XD17	25	21	12,5	M12	35	17	16,4	2	8.8°	41800	Yes	0,08
5988092	VSM17D032Z03M16XD17	32	29	17,0	M16	40	24	16,3	3	5.7°	34700	Yes	0,17
5988131	VSM17D40Z03M016XD17	40	29	17,0	M16	40	24	16,2	3	4.0°	29800	Yes	0,20
5988093	VSM17D040Z04M16XD17	40	29	17,0	M16	40	24	16,2	4	4.0°	29800	Yes	0,20

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page A114.

VSM17 • Weldon® End Mills • Metric



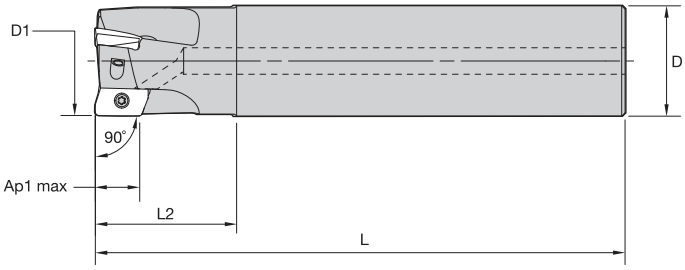
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988102	VSM17D025Z02B25XD17	25	25	90	33	16,4	2	8.8°	41800	Yes	0,26
5988103	VSM17D032Z03B32XD17	32	32	100	39	16,3	3	5.7°	34700	Yes	0,48
5988104	VSM17D040Z04B40XD17	40	40	110	39	16,2	4	4.0°	29800	Yes	0,87

NOTE: Weldon type not recommended for finishing operations.
NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page A114.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

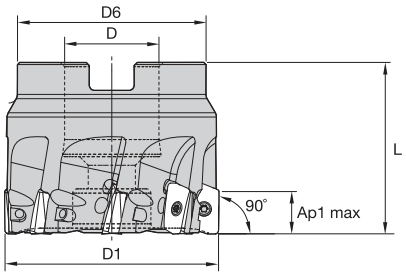
VSM17™ • Cylindrical End Mills • Metric



order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988055	VSM17D025Z02A25XD17L110	25	25	110	44	16,4	2	8.8°	41800	Yes	0,32
5988056	VSM17D025Z02A25XD17L170	25	25	170	44	16,4	2	8.8°	41800	Yes	0,54
5988107	VSM17D032Z02A32XD17L120	32	32	120	50	16,3	2	5.7°	34700	Yes	0,60
5988108	VSM17D032Z02A32XD17L210	32	32	210	50	16,3	2	5.7°	34700	Yes	1,14
5988057	VSM17D032Z03A32XD17L120	32	32	120	50	16,3	3	5.7°	34700	Yes	0,60
5988058	VSM17D032Z03A32XD17L210	32	32	210	50	16,3	3	5.7°	34700	Yes	1,13
5988109	VSM17D040Z03A32XD17L130	40	32	130	50	16,2	3	4.0°	29800	Yes	0,77
5988110	VSM17D040Z03A32XD17L250	40	32	250	50	16,2	3	4.0°	29800	Yes	1,49
5988059	VSM17D040Z04A32XD17L130	40	32	130	50	16,2	4	4.0°	29800	Yes	0,77
5988060	VSM17D040Z04A32XD17L250	40	32	250	50	16,2	4	4.0°	29800	Yes	1,49

NOTE: Standard milling cutters will accept insert nose radii up to 2,0mm without modification.
For tool body modification instructions, see page A114.

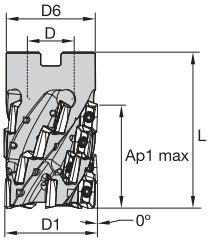
VSM17 • Shell Mills • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988094	VSM17D040Z04S16XD17	40	16	37	40	16,2	4	4.0°	29800	Yes	0,19
5988095	VSM17D050Z04S22XD17	50	22	45	40	16,1	4	3.0°	25800	Yes	0,28
5988096	VSM17D050Z05S22XD17	50	22	45	40	16,1	5	3.0°	25800	Yes	0,29
5988134	VSM17D050Z06S22XD17	50	22	45	40	16,1	6	3.0°	25800	Yes	0,28
5988097	VSM17D063Z05S22XD17	63	22	50	40	16,0	5	2.1°	22400	Yes	0,45
5988135	VSM17D063Z06S22XD17	63	22	50	40	16,0	6	2.1°	22400	Yes	0,45
5988098	VSM17D080Z06S27XD17	80	27	60	50	15,9	6	1.6°	19500	Yes	0,98
5988133	VSM17D080Z07S27XD17	80	27	60	50	15,9	7	1.6°	19500	Yes	0,96
5988099	VSM17D100Z08S32XD17	100	32	80	50	15,8	8	1.2°	17200	Yes	1,63
5988100	VSM17D125Z09S40XD17	125	40	90	63	15,7	9	.9°	15200	Yes	2,94
5988101	VSM17D160Z12S40XD17	160	40	100	63	15,8	12	.7°	13300	Yes	3,66

NOTE: Standard milling cutters will accept insert nose radii up to 2,0mm without modification.
For tool body modification instructions, see page A114.

VSM17™ • Helical Shell Mills • Metric

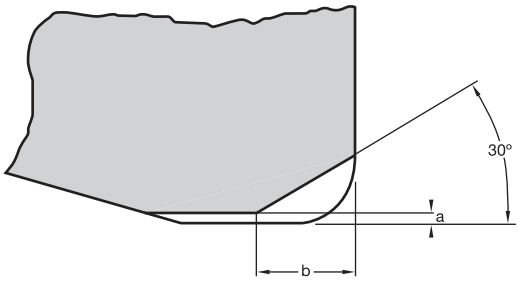


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	max RPM	coolant supply	kg
6740674	**VSM17H050Z04S022XD17**	50	22	44	85	60,4	16	4	2.8	25000	Yes	0,7
6740675	**VSM17H050Z05S022XD17**	50	22	44	85	60,4	20	5	2.8	25000	Yes	0,7
6740676	**VSM17H063Z04S027XD17**	63	27	60	100	75,0	20	4	2.1	22300	Yes	1,5
6740677	**VSM17H063Z05S027XD17**	63	27	60	100	75,0	25	5	2.1	22300	Yes	1,5
6740678	**VSM17H080Z05S032XD17**	80	32	70	100	75,0	25	5	1.6	19700	Yes	2,6

NOTE: Z = number of pockets; ZU = number of flutes.

Application Example

Modification Instructions for Use of Larger Radii Inserts
(Shoulder Mills and Helical Mills)

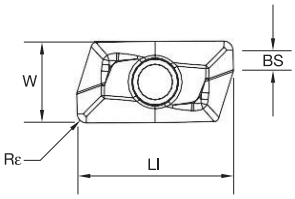


insert corner radius	material to remove	
	a	b
3,1mm	0,2mm	1,8mm

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM17™ • XDCT-ML

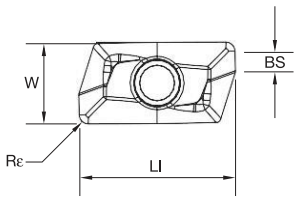


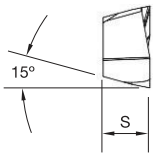
● first choice
○ alternate choice

	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K	●	●			○	○			○	
N			●	●				○	○	
S					●	○	○	●	○	●
H					○				○	

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
XDCT170404PEERML	2	19,15	2,62	4,90	9,60	0,40	0,04	ı	ı	ı	ı	5989010	ı	ı	ı	ı	ı
XDCT170408PEERML	2	19,15	2,22	4,90	9,60	0,80	0,04	ı	ı	ı	ı	5988983	5988982	5988981	6180180	ı	ı
XDCT170412PEERML	2	19,16	1,82	4,90	9,60	1,20	0,04	ı	ı	ı	ı	5988988	5988987	5988986	6180211	ı	ı
XDCT170416PEERML	2	19,17	1,42	4,90	9,60	1,60	0,04	ı	ı	ı	ı	6001257	ı	ı	6425261	ı	ı
XDCT170420PEERML	2	19,17	1,01	4,90	9,60	2,00	0,04	ı	ı	ı	ı	6001255	ı	ı	6425263	ı	ı
XDCT170424PEERML	2	19,17	0,63	4,90	9,60	2,40	0,04	ı	ı	ı	ı	6001253	ı	ı	6425264	ı	ı
XDCT170432PEERML	2	18,85	–	4,89	9,59	3,20	0,04	ı	ı	ı	ı	6001251	ı	ı	6425265	ı	ı
XDCT170440PEERML	2	18,33	–	4,87	9,59	4,00	0,04	ı	ı	ı	ı	6001239	ı	ı	6425266	ı	ı
XDCT170460PEERML	2	17,02	–	4,80	9,56	6,00	0,04	ı	ı	ı	ı	ı	ı	6118069	6232053	ı	ı

VSM17™ • XDCT-ALP



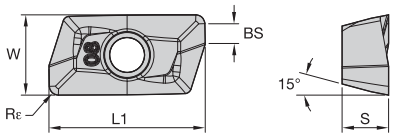


● first choice
○ alternate choice

	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K	●	●			○	○			○	
N			●	●				○	○	
S					●	○	○	●	○	●
H					○				○	

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
XDCT170404PEFRALP	2	19,15	2,62	4,90	9,60	0,40	0,02	●	●	6007341	6007220	●	●	●	●	●	●
XDCT170408PEFRALP	2	19,15	2,22	4,90	9,60	0,80	0,02	●	●	6007345	6007344	●	●	●	●	●	●
XDCT170412PEFRALP	2	19,16	1,82	4,90	9,60	1,20	0,02	●	●	6007342	6001537	●	●	●	●	●	●
XDCT170416PEFRALP	2	19,17	1,42	4,90	9,60	1,60	0,02	●	●	●	6001256	●	●	●	●	●	●
XDCT170420PEFRALP	2	19,17	1,01	4,90	9,60	2,00	0,02	●	●	●	6001254	●	●	●	●	●	●
XDCT170424PEFRALP	2	19,17	0,63	4,90	9,60	2,40	0,02	●	●	●	6001252	●	●	●	●	●	●
XDCT170432PEFRALP	2	18,85	–	4,88	9,59	3,20	0,02	●	●	●	6001240	●	●	●	●	●	●
XDCT170440PEFRALP	2	18,33	–	4,87	9,59	4,00	0,02	●	●	●	6001238	●	●	●	●	●	●
XDCT170460PEFRALP	2	17,02	–	4,80	9,56	6,00	0,02	●	●	●	6118070	●	●	●	●	●	●

VSM17™ • XDET -MU

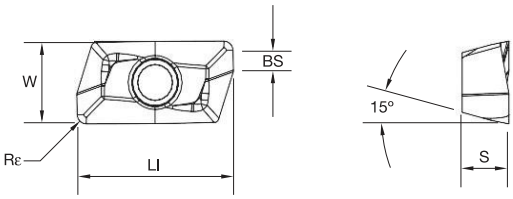


● first choice
○ alternate choice

	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K	●	●			○	○			○	
N			●	●				○	○	
S					●	○	○	●	○	●
H					○				○	

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
XDET170408PEERMU	2	19,15	2,22	4,90	9,60	0,80	0,04	-	-	-	-	-	-	-	-	6862947	-

VSM17 • XDPT-MM

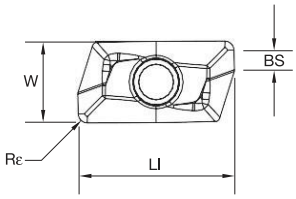


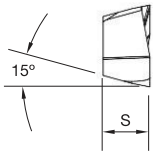
● first choice
○ alternate choice

	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K	●	●			○	○			○	
N			●	●				○	○	
S					●	○	○	●	○	●
H					○				○	

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
XDPT170404PESRMM	2	19,15	2,52	4,90	9,60	0,40	0,10	-	-	-	-	-	-	5987689	-	-	5987690
XDPT170408PESRMM	2	19,15	2,15	4,90	9,60	0,80	0,10	5987948	6242460	-	-	5987949	5987947	5987946	6180212	-	5987950
XDPT170412PESRMM	2	19,16	1,77	4,90	9,60	1,20	0,10	5988138	-	-	-	5988151	5988140	5988139	6180213	-	5988152
XDPT170416PESRMM	2	19,17	1,38	4,90	9,60	1,60	0,10	5988153	-	-	-	5988155	5988156	5988154	6180214	-	-
XDPT170420PESRMM	2	19,17	0,99	4,90	9,60	2,00	0,10	-	-	-	-	5988158	5988160	5988159	6425145	-	-
XDPT170424PESRMM	2	19,17	0,62	4,90	9,60	2,40	0,10	-	-	-	-	5988203	-	5988202	6425146	-	-
XDPT170432PESRMM	2	18,85	–	4,89	9,59	3,20	0,10	-	-	-	-	5988206	5988204	5988205	6277261	-	-
XDPT170440PESRMM	2	18,33	–	4,87	9,59	4,00	0,10	-	-	-	-	5988970	-	5988969	6425147	-	-

VSM17™ • XDPT-MH



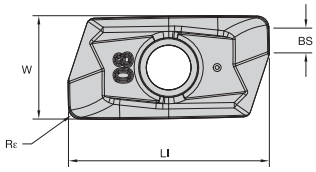


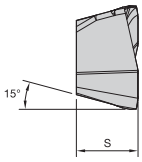
● first choice
○ alternate choice

	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K	●	●			○	○			○	
N			●	●				○	○	
S					●	○	○	●	○	●
H					○				○	

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
XDPT170408PESRMH	2	19,15	2,10	4,91	9,60	0,80	0,13	5989053	ı	ı	ı	ı	5989054	5989052	6425148	ı	ı
XDPT170412PESRMH	2	19,16	1,73	4,91	9,60	1,20	0,13	5991817	ı	ı	ı	ı	5991816	5991815	6425149	ı	ı

VSM17 • XDPT-MU





● first choice
○ alternate choice

	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K	●	●			○	○			○	
N			●	●				○	○	
S					●	○	○	●	○	●
H					○				○	

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU20PM	WU35PM
XDPT170408PESRMU	2	19,15	2,15	4,90	9,60	0,80	0,05	ı	ı	ı	ı	ı	ı	ı	ı	6487444	ı

VSM17 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Universal Geometry	Universal Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XDCT-ML	WP40PM	**XDPT-MM**	**WP40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP40PM
P3–P4	XDCT-ML	WP40PM	**XDPT-MM**	**WP40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP40PM
P5–P6	XDPT-MM	WP25PM	**XDPT-MM**	**WP35CM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP40PM
M1–M2	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MM	WS40PM
M3	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MH	WS40PM
K1–K2	XDPT-MM	WK15CM	**XDPT-MM**	**WK15CM**	**XD..-MU**	**WU20PM**	XDPT-MH	WK15CM
K3	XDPT-MM	WP35CM	**XDPT-MM**	**WP35CM**	**XD..-MU**	**WU20PM**	XDPT-MH	WP35CM
N1–N2	XDCT-ALP	WN10HM	**XDCT-ALP**	**WN25PM**	**–**	**–**	XDCT-ALP	WN25PM
N3	XDCT-ALP	WN10HM	**XDCT-ALP**	**WN25PM**	**–**	**–**	XDCT-ALP	WN25PM
S1–S2	XDCT-ML	WP25PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MM	WS40PM
S3	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MM	WS40PM
S4	XDCT-ML	WS40PM	**XDPT-MM**	**WS40PM**	**XD..-MU**	**WU20PM**	XDPT-MM	WS40PM
H1	–	–	**–**	**–**	**XD..-MU**	**WU20PM**	–	–

NOTE: Use XDCT/XDET for precision.

VSM17™ • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN10HM			WN25PM			WP25PM		
P	1	—	–	—	—	–	—	—	–	—	—	–	—	330	**285**	270
	2	—	–	—	—	–	—	—	–	—	—	–	—	275	**240**	200
	3	—	–	—	—	–	—	—	–	—	—	–	—	255	**215**	175
	4	—	–	—	—	–	—	—	–	—	—	–	—	225	**185**	150
	5	—	–	—	—	–	—	—	–	—	—	–	—	185	**170**	150
	6	—	–	—	—	–	—	—	–	—	—	–	—	165	**125**	100
M	1	—	–	—	—	–	—	—	–	—	—	–	—	205	**180**	165
	2	—	–	—	—	–	—	—	–	—	—	–	—	185	**160**	130
	3	—	–	—	—	–	—	—	–	—	—	–	—	140	**120**	95
K	1	420	**385**	340	270	**245**	215	—	–	—	—	–	—	230	**205**	185
	2	335	**295**	275	210	**190**	175	—	–	—	—	–	—	180	**160**	150
	3	280	**250**	230	175	**160**	145	—	–	—	—	–	—	150	**135**	120
N	1	—	–	—	—	–	—	795	**695**	600	1075	**945**	875	—	–	—
	2	—	–	—	—	–	—	795	**695**	600	945	**875**	760	—	–	—
	3	—	–	—	—	–	—	560	**485**	420	945	**875**	760	—	–	—
S	1	—	–	—	—	–	—	—	–	—	—	–	—	40	**35**	25
	2	—	–	—	—	–	—	—	–	—	—	–	—	40	**35**	25
	3	—	–	—	—	–	—	—	–	—	—	–	—	50	**40**	25
	4	—	–	—	—	–	—	—	–	—	—	–	—	70	**50**	35
H	1	—	–	—	—	–	—	—	–	—	—	–	—	120	**90**	70

Material Group		WP35CM			WP40PM			WS40PM			WU20PM			WU35PM		
P	1	455	**395**	370	295	**260**	245	—	–	—	330	**290**	270	260	**230**	215
	2	280	**255**	230	250	**215**	180	—	–	—	275	**250**	200	220	**190**	160
	3	255	**230**	205	230	**195**	160	—	–	—	255	**220**	175	200	**170**	140
	4	190	**175**	160	205	**170**	135	—	–	—	225	**190**	150	180	**150**	120
	5	260	**230**	210	170	**155**	135	170	**145**	120	185	**175**	150	150	**135**	120
	6	160	**135**	110	150	**115**	90	150	**110**	80	165	**130**	100	130	**100**	80
M	1	205	**185**	155	195	**170**	155	210	**170**	140	205	**180**	165	170	**150**	135
	2	185	**160**	140	175	**150**	125	180	**145**	120	185	**160**	130	155	**130**	110
	3	145	**130**	115	130	**115**	90	145	**110**	85	140	**120**	95	115	**100**	80
K	1	295	**265**	240	—	–	—	—	–	—	250	**220**	185	—	–	—
	2	235	**210**	190	—	–	—	—	–	—	200	**180**	150	—	–	—
	3	195	**175**	160	—	–	—	—	–	—	180	**150**	120	—	–	—
N	1	—	–	—	—	–	—	—	–	—	550	**470**	400	—	–	—
	2	—	–	—	—	–	—	—	–	—	550	**470**	400	—	–	—
	3	—	–	—	—	–	—	—	–	—	400	**350**	300	—	–	—
S	1	—	–	—	—	–	—	40	**35**	25	40	**35**	25	35	**30**	25
	2	—	–	—	—	–	—	40	**35**	25	40	**35**	25	35	**30**	25
	3	—	–	—	—	–	—	50	**40**	25	50	**40**	25	45	**35**	25
	4	—	–	—	—	–	—	60	**50**	30	70	**50**	35	60	**45**	30
H	1	—	–	—	—	–	—	—	–	—	110	**80**	70	—	–	—

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VSM17 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..ALP	0,12	**0,23**	0,40	0,08	**0,17**	0,29	0,06	**0,13**	0,22	0,06	**0,11**	0,19	0,05	**0,10**	0,18	.F..ALP
.E..ML	0,16	**0,35**	0,46	0,12	**0,25**	0,33	0,09	**0,19**	0,25	0,08	**0,16**	0,22	0,07	**0,15**	0,20	.E..ML
.S..MM/.S..MU	0,16	**0,40**	0,64	0,12	**0,29**	0,46	0,09	**0,22**	0,34	0,08	**0,19**	0,30	0,07	**0,18**	0,28	.S..MM/.S..MU
.S..MH	0,23	**0,46**	0,74	0,17	**0,33**	0,54	0,13	**0,25**	0,40	0,11	**0,22**	0,35	0,10	**0,20**	0,32	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.

VSM Single-Sided Series

VSM22™ Shoulder Mill

The VSM22 shoulder mill will continuously face large-walled, big components in stainless steel, cast iron, and steel using high depth of cuts while providing free chip flow for a clean workpiece.

20mm long insert cutting edge length, 6,35mm thick.

Precision ground insert with a positive rake and helical cutting edge to enable smooth cutting action, even in unstable conditions.

2,14mm wiper facet for accurate indexing.

Through-coolant cutter body.

Cutters with a chip gash for free chip flow and clean workpiece.

The VSM22 shoulder mill is built for heavy-duty machining equipped with precision ground inserts featuring 20mm long cutting edges to face big components with high DOCs.

Two insert geometries are available for heavy roughing or general-purpose applications.

TWO INSERTS, EACH AVAILABLE IN THREE GRADES

-MH

-MM

WK15CM

K

WK15CM is a wear-resistant grade with balanced toughness for general milling of cast irons. Best results in dry machining, but can also be used wet.

WP35CM

P M K S

WP35CM has a wide range of applications in general and rough milling of steels and cast iron. Performs best in dry, but can also be used under wet conditions.

WU20PM

P M K N S H

WU20PM is a universal grade for machining of steel, stainless steel, and high-temperature alloys. Also suitable for machining of gray and nodular irons. Resists breakage and offers improved wear resistance and increased strength. Can be used for both dry and wet machining.

RELIABILITY, WHEN IT MATTERS MOST

PRODUCT

SERIES

VSM22™

DIAMETER RANGE

50–125mm

SHANK TYPES

Shell Mills

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

ENERGY

APPLICATIONS

FACE MILLING

PLUNGE MILLING

POCKETING

RAMPING

SIDE MILLING/ SHOULDER MILLING: SQUARE END

SLOTTING: SQUARE END

POCKET MILLING

SLOTTING SIDE

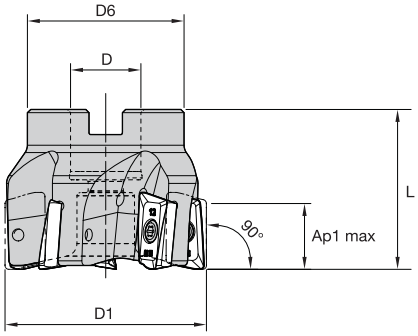
HEAVY DUTY

6,35mm thick -MH insert for heavy roughing.

HIGH DEPTH OF CUT

Insert with 20mm long cutting edge coupled with large chip gash to achieve high DOC.

VSM22™ Series • 90° • Shell Mills • Metric

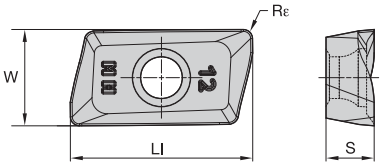


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3889581	VSM22D050Z04S22XP22	50	22	40	50	20,0	4	—	Yes	0,27
4056543	VSM22D063Z05S22XP22	63	22	49	50	20,0	5	—	Yes	0,54
3789432	VSM22D080Z06S27XP22	80	27	60	50	20,0	6	—	Yes	0,86
4056544	VSM22D100Z08S32XP22	100	32	78	50	20,0	8	—	Yes	1,38
4056545	VSM22D125Z09S40XP22	125	40	89	63	20,0	9	—	Yes	2,73
4056546	VSM22D160Z10S40XP22	160	40	90	63	20,0	10	6600	Yes	3,91

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM22™ • XPHT-MH

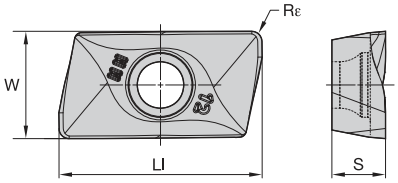


● first choice
○ alternate choice

P		●	●
M		●	●
K	●	○	○
N			○
S		○	○
H			○

ISO catalogue number	cutting edges	LI	S	W	Rε	hm	WK15CM	WP35CM	WU20PM
XPHT220612PDSRMH	2	22,55	6,35	12,70	1,20	0,23	6094886	6852416	3789524

VSM22 • XPHT-MM



● first choice
○ alternate choice

P		●	●
M		●	●
K	●	○	○
N			○
S		○	○
H			○

ISO catalogue number	cutting edges	LI	S	W	Rε	hm	WK15CM	WP35CM	WU20PM
XPHT220612PDSRMM	2	22,55	6,35	12,70	1,20	0,23	6870184	6852415	-
XPHT220612PDSRMM	2	22,55	6,35	12,70	1,20	0,05	-	-	2567049

VSM22™ • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MM	WP35CM	**.S..MH**	**WU20PM**	.S..MH	WP35CM
P3–P4	.S..MM	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
P5–P6	.S..MM	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
M1–M2	.S..MH	WU20PM	**.S..MH**	**WU20PM**	.S..MH	WU20PM
M3	.S..MM	WP35CM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
K1–K2	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MH	WK15CM
K3	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MH	WU20PM
N1–N2	.S..MH	WU20PM	**.S..MH**	**WU20PM**	.S..MH	WU20PM
N3	.S..MH	WU20PM	**.S..MH**	**WU20PM**	.S..MH	WU20PM
S1–S2	.S..MH	WU20PM	**.S..MH**	**WU20PM**	.S..MH	WU20PM
S3	.S..MH	WU20PM	**.S..MH**	**WU20PM**	.S..MH	WU20PM
S4	.S..MM	WP35CM	**.S..MM**	**WP35CM**	.S..MH	WP35CM
H1	.S..MH	WU20PM	**.S..MH**	**WU20PM**	–	–

VSM22 • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WU20PM			WP35CM		
P	1	—	**—**	—	330	**290**	270	455	**395**	370
	2	—	**—**	—	275	**250**	200	280	**255**	230
	3	—	**—**	—	255	**220**	175	255	**230**	205
	4	—	**—**	—	225	**190**	150	190	**175**	160
	5	—	**—**	—	185	**175**	150	260	**230**	210
	6	—	**—**	—	165	**130**	100	160	**135**	—
M	1	—	**—**	—	205	**180**	165	205	**185**	155
	2	—	**—**	—	185	**160**	130	185	**160**	140
	3	—	**—**	—	140	**120**	95	145	**130**	115
K	1	420	**385**	340	250	**220**	185	295	**265**	240
	2	335	**295**	275	200	**180**	150	235	**210**	190
	3	280	**250**	230	180	**150**	120	195	**175**	160
N	1	—	**—**	—	550	**470**	400	—	**—**	—
	2	—	**—**	—	550	**470**	400	—	**—**	—
	3	—	**—**	—	400	**350**	300	—	**—**	—
S	1	—	**—**	—	40	**35**	25	—	**—**	—
	2	—	**—**	—	40	**35**	25	—	**—**	—
	3	—	**—**	—	50	**40**	25	—	**—**	—
	4	—	**—**	—	70	**50**	35	66	**50**	33
H	1	—	**—**	—	110	**80**	70	—	**—**	—
	2	—	**—**	—	—	**—**	—	—	**—**	—
	3	—	**—**	—	—	**—**	—	—	**—**	—

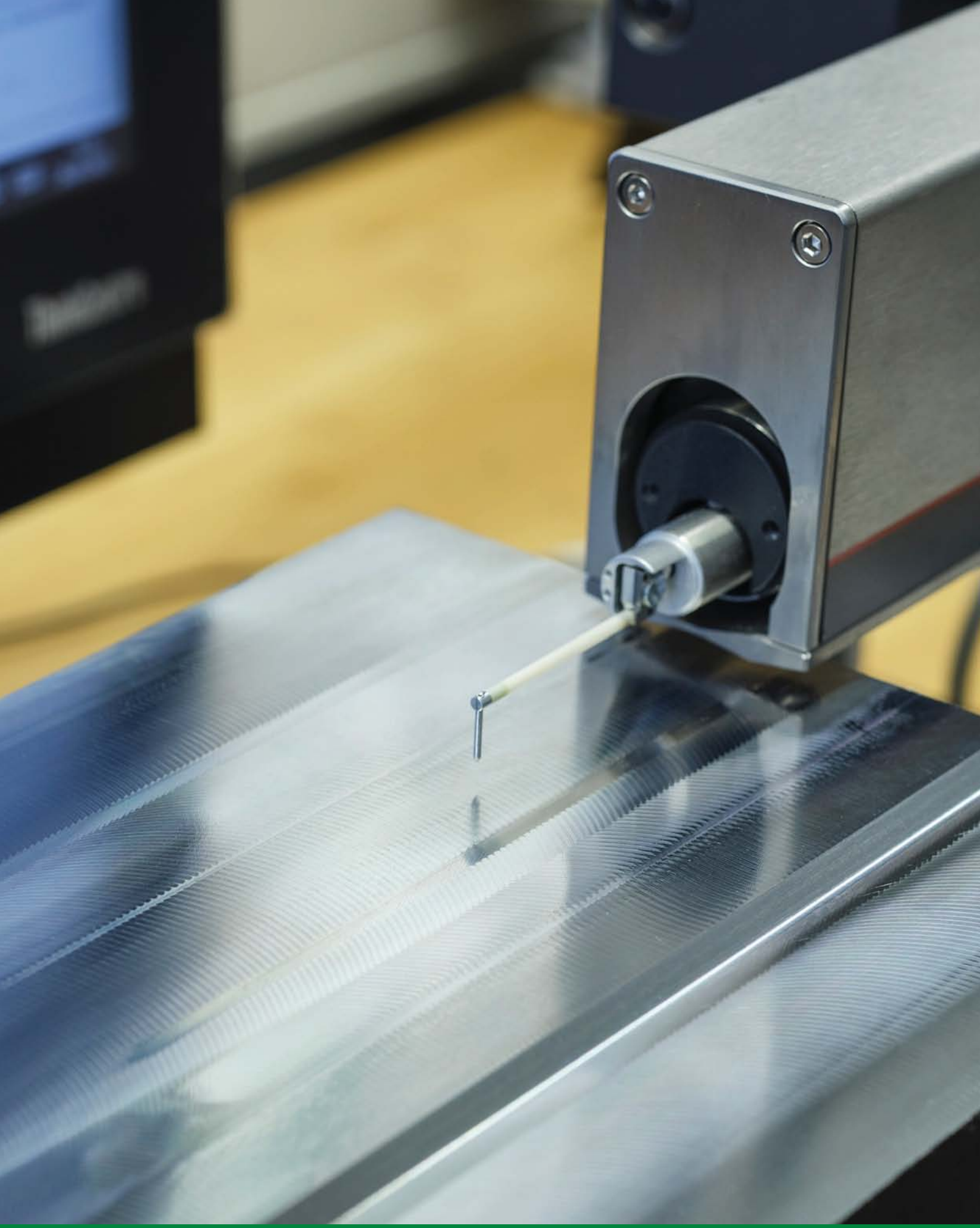
*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

VSM22 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.S..MM	0,23	**0,55**	0,90	0,17	**0,40**	0,65	0,13	**0,30**	0,49	0,11	**0,26**	0,42	0,10	**0,24**	0,39	.S..MM
.S..MH	0,23	**0,59**	0,95	0,17	**0,43**	0,68	0,13	**0,32**	0,51	0,11	**0,28**	0,44	0,10	**0,25**	0,41	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.
For new applications, starting at a lighter feed rate is recommended.
% = ae/Dc X 100 (ae = radial depth of cut, Dc = cutting diameter)



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WIDIA™

VSM Series

VSM490-10™, VSM490-15™ Shoulder Mills

The VSM Series is a four-edged, double-sided roughing shoulder mill with embedded finishing capabilities known for producing a smooth wall finish in axial step-down jobs.

VSM490-10
Ap1 max = 10mm
Taper 40 spindles

VSM490-15
Ap1 max = 15mm
Taper 50 spindles

FOUR INSERT GEOMETRIES FOR ALL MATERIAL GROUPS IN SHOULDER MILLING APPLICATIONS

★ -ALP

N

For non-ferrous materials.

★ -ML

P M K S H

First choice for stainless steel, light machining, and finishing jobs.

★ -MM

P M K S H

First choice for general purpose in all material groups.

★ -MH

P K

First choice for HPC roughing cast iron. Strongest edge protection with additional margins.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

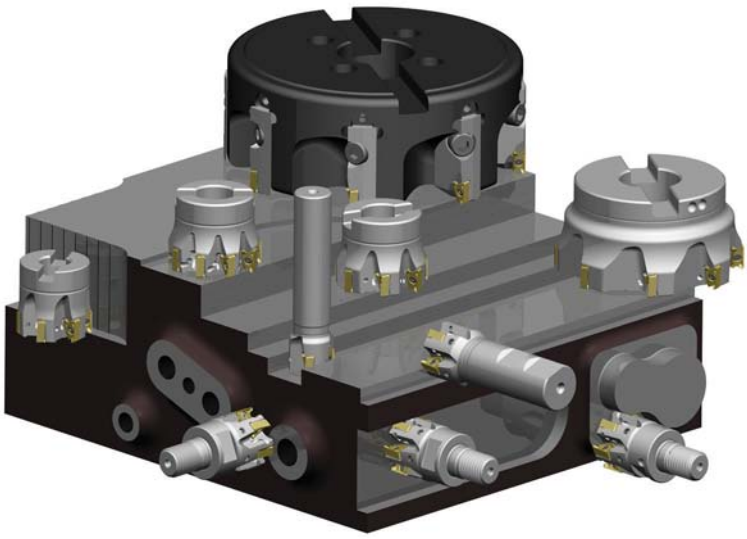
FOUR-EDGED SHOULDER MILL

PRODUCT		INSERTS		
SERIES	**DIAMETER RANGE**	**INSERT TYPE**	**GRADE**	**MATERIALS**
VSM490-10™	Screw-On End Mills: 16–32mm Cylindrical End Mills: 16–25mm Shell Mills: 40–125mm Weldon® End Mills: 16–25mm	ALP, ML, MM, MH	WP40PM, WS40PM, WP25PM, WU10PM	P M K S H
VSM490-15™	Weldon End Mills: 16–32mm Cylindrical End Mills: 16–32mm Shell Mills: 40–125mm	ALP, ML, MM, MH	WS40PM, WP25PM, WP40PM	P M S

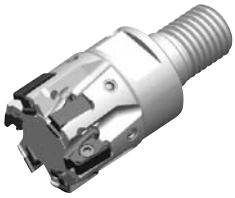
APPLICATIONS

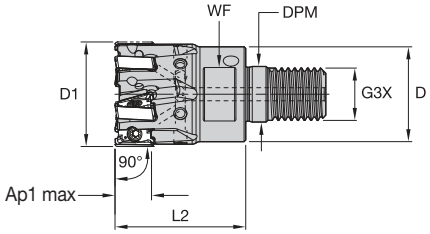
FACE MILLING | EASED CHAMFER | SIDE MILLING/ SHOULDER MILLING: SQUARE END | SLOTTING: SQUARE END | POCKETING | SIDE MILLING/ SHOULDER MILLING: BOTTOM SHOULDERING

INDUSTRY



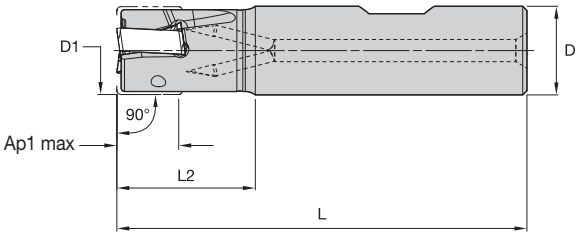
VSM490-10™ • Screw-On End Mills • Metric



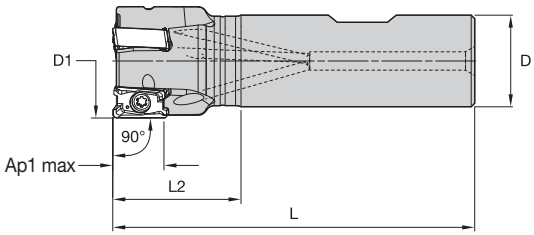


order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
6425553	VSM490D016Z02M08XN10	16	13	8,5	M8	25	10	10,0	2	48000	Yes	0,03
6425554	VSM490D020Z03M10XN10	20	18	10,5	M10	28	15	10,0	3	40200	Yes	0,05
6425555	VSM490D025Z04M12XN10	25	21	12,5	M12	32	17	10,0	4	34300	Yes	0,09
6425556	VSM490D032Z05M16XN10	32	29	17,0	M16	40	24	10,0	5	29200	Yes	0,20
6425557	VSM490D032Z06M16XN10	32	29	17,0	M16	40	24	10,0	6	29200	Yes	0,20

VSM490-10 • Weldon® End Mills • Metric



Regular Shank



Reduced Shank

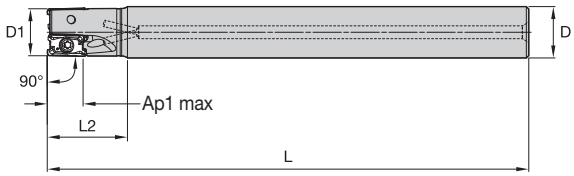
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6425558	VSM490D016Z02B16XN10	16	16	74	25	10,0	2	48000	Yes	0,09
6425559	VSM490D020Z02B20XN10	20	20	79	28	10,0	2	40200	Yes	0,16
6425560	VSM490D020Z03B20XN10	20	20	79	28	10,0	3	40200	Yes	0,16
6425571	VSM490D025Z03B20XN10	25	20	79	28	10,0	3	34300	Yes	0,18
6425572	VSM490D025Z03B25XN10	25	25	89	32	10,0	3	34300	Yes	0,29
6425573	VSM490D025Z04B25XN10	25	25	89	32	10,0	4	34300	Yes	0,29
6425574	VSM490D032Z04B25XN10	32	25	89	32	10,0	4	29200	Yes	0,29
6425575	VSM490D032Z05B25XN10	32	25	89	32	10,0	5	29200	Yes	0,33

NOTE: Weldon type not recommended for finishing operations.

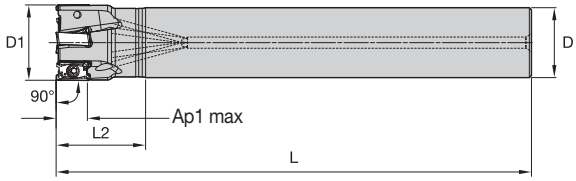
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM490™-10 • Cylindrical End Mills (regular and long version) • Metric



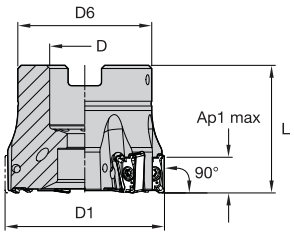
Regular Shank



Reduced Shank

order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6425502	VSM490D016Z02A16XN10L090	16	16	90	25	10,0	2	48000	Yes	0,12
6425503	VSM490D016Z02A16XN10L150	16	16	150	25	10,0	2	48000	Yes	0,21
6425504	VSM490D018Z02A16XN10L150	18	16	150	25	10,0	2	43500	Yes	0,21
6425506	VSM490D020Z02A20XN10L150	20	20	150	28	10,0	2	40200	Yes	0,33
6425505	VSM490D020Z03A20XN10L090	20	20	90	28	10,0	3	40200	Yes	0,19
6425507	VSM490D020Z03A20XN10L150	20	20	150	28	10,0	3	40200	Yes	0,33
6425508	VSM490D022Z03A20XN10L150	22	20	150	28	10,0	3	37500	Yes	0,34
6425509	VSM490D025Z03A20XN10L100	25	20	100	28	10,0	3	34300	Yes	0,23
6425511	VSM490D025Z03A25XN10L170	25	25	170	43	10,0	3	34300	Yes	0,60
6425510	VSM490D025Z04A25XN10L100	25	25	100	43	10,0	4	34300	Yes	0,33
6425512	VSM490D025Z04A25XN10L170	25	25	170	43	10,0	4	34300	Yes	0,59
6425513	VSM490D028Z04A25XN10L170	28	25	170	32	10,0	4	31800	Yes	0,61
6425514	VSM490D032Z04A25XN10L110	32	25	110	32	10,0	4	29200	Yes	0,41
6425516	VSM490D032Z04A25XN10L200	32	25	200	32	10,0	4	29200	Yes	0,75
6425515	VSM490D032Z05A25XN10L110	32	25	110	32	10,0	5	29200	Yes	0,41
6425517	VSM490D032Z05A25XN10L200	32	25	200	32	10,0	5	29200	Yes	0,75

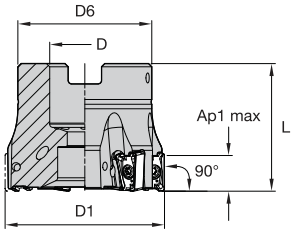
VSM490-10 • Shell Mills • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6425434	VSM490D040Z04S16XN10	40	16	37	40	10,0	4	25400	Yes	0,23
6425435	VSM490D040Z06S16XN10	40	16	37	40	10,0	6	25400	Yes	0,23
6425436	VSM490D040Z07S16XN10	40	16	37	40	10,0	7	25400	Yes	0,23
6425437	VSM490D050Z05S22XN10	50	22	42	40	10,0	5	22300	Yes	0,31
6425438	VSM490D050Z07S22XN10	50	22	42	40	10,0	7	22300	Yes	0,35
6425439	VSM490D050Z09S22XN10	50	22	42	40	10,0	9	22300	Yes	0,32
6425440	VSM490D063Z05S22XN10	63	22	49	40	10,0	5	19500	Yes	0,56
6425481	VSM490D063Z07S22XN10	63	22	49	40	10,0	7	19500	Yes	0,56
6425482	VSM490D063Z09S22XN10	63	22	49	40	10,0	9	19500	Yes	0,56
6425483	VSM490D080Z06S27XN10	80	27	60	50	10,0	6	17100	Yes	1,10
6425484	VSM490D080Z08S27XN10	80	27	60	50	10,0	8	17100	Yes	1,11
6425485	VSM490D080Z10S27XN10	80	27	60	50	10,0	10	17100	Yes	1,12
6425486	VSM490D100Z08S32XN10	100	32	80	50	10,0	8	15200	Yes	1,73
6425487	VSM490D100Z12S32XN10	100	32	80	50	10,0	12	15200	Yes	1,74
6425488	VSM490D125Z10S40XN10	125	40	90	63	10,0	10	13500	Yes	3,18
6425489	VSM490D125Z14S40XN10	125	40	90	63	10,0	14	13500	Yes	3,20

NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

VSM490-10 • Shell Mills • Japanese Industry Standard JIS • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6425490	VSM490D080Z06S254XN10JIS	80	25,40	50	50	10,0	6	17100	Yes	0,93
6425491	VSM490D080Z08S254XN10JIS	80	25,40	50	50	10,0	8	17100	Yes	0,94
6425492	VSM490D100Z08S3175XN10JIS	100	31,75	60	50	10,0	8	15200	Yes	1,41
6425493	VSM490D125Z10S381XN10JIS	125	38,10	80	63	10,0	10	13500	Yes	3,02

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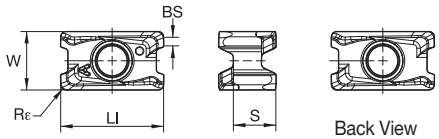
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM490-10 • XNGU-ALP • For Aluminum and Other Non-Ferrous Alloys

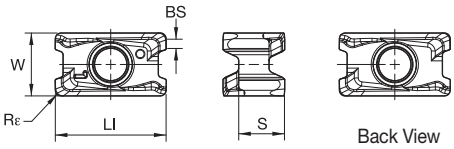


● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
P				●	●	●	●	
M				●	●	●	●	
K	●	●		○	○			●
N			●				○	
S				●	○	○	●	
H				○				●

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNGU100404ERALP	4	11,66	4,83	6,60	1,37	0,40	0,02	'	'	6425382	'	'	'	'	'
XNGU100408ERALP	4	11,66	4,83	6,60	1,00	0,80	0,02	'	'	6425411	'	'	'	'	'

VSM490-10 • XNGU-ML • Precision Finishing and Light Machining

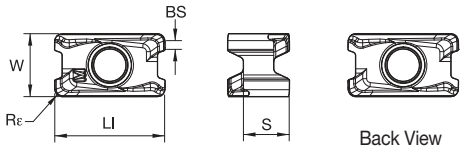


● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
P				●	●	●	●	
M				●	●	●	●	
K	●	●		○	○			●
N			●				○	
S				●	○	○	●	
H				○				●

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNGU100404ERML	4	11,66	4,83	6,60	1,37	0,40	0,02	'	'	'	6425414	'	'	6425415	'
XNGU100408ERML	4	11,66	4,83	6,60	1,00	0,80	0,02	'	'	'	6425369	'	'	6425370	6425421

VSM490-10 • XNGU-MM • Universal Geometry for Medium Machining

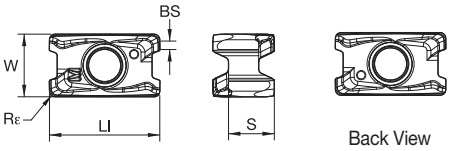


● first choice
○ alternate choice

P					●	●	●	●						
M					●	●	●	●						
K	●	●			○	○			●					
N				●				○						
S					●	○	○	●						
H					○				●					

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNGU100404SRMM	4	11,66	4,83	6,60	1,37	0,40	0,08	-	-	-	6425416	-	-	6425417	-
XNGU100408SRMM	4	11,66	4,83	6,60	1,00	0,80	0,08	-	-	-	6425422	-	-	6425423	6425424

VSM490-10 • XNGU-MH • Heavy Roughing

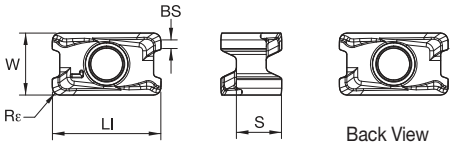


● first choice
○ alternate choice

P					●	●	●	●						
M					●	●	●	●						
K	●	●			○	○			●					
N				●				○						
S					●	○	○	●						
H					○				●					

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNGU100408SRMH	4	11,66	4,83	6,60	0,90	0,80	0,08	6425359	-	-	6425356	6425360	6425357	-	-

VSM490-10 • XNPU-ML • Light Machining

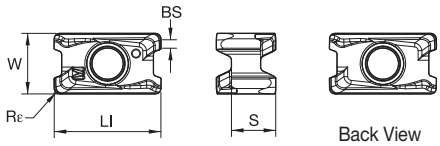


● first choice
○ alternate choice

P					●	●	●	●						
M					●	●	●	●						
K	●	●		○	○			●						
N			●				○							
S				●	○	○	●							
H				○				●						

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNPU100408ERML	4	11,60	4,83	6,60	0,90	0,80	0,02	-	6425366	-	6425367	-	-	6425368	-

VSM490-10 • XNPU-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

P					●	●	●	●						
M					●	●	●	●						
K	●	●		○	○			●						
N			●				○							
S				●	○	○	●							
H				○				●						

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNPU100408SRMM	4	11,60	4,83	6,60	0,90	0,80	0,08	6425364	6425270	-	6425361	6425365	6425363	6425362	-
XNPU100412SRMM	4	11,61	4,83	6,60	0,50	1,20	0,08	6425355	-	-	6425352	-	6425354	6425353	-
XNPU100416SRMM	4	11,61	4,83	6,60	0,10	1,60	0,08	-	-	-	6425267	-	6425269	6425268	-

VSM490-10 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XNGU-ML	WP40PM	**XNPU-MM**	**WP40PM**	XNPU-MM	WP40PM
P3–P4	XNGU-ML	WP40PM	**XNPU-MM**	**WP40PM**	XNPU-MM	WP40PM
P5–P6	XNGU-MM	WP25PM	**XNPU-MM**	**WP35CM**	XNPU-MM	WP40PM
M1–M2	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
M3	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
K1–K2	XNPU-ML	WK15PM	**XNGU-MH**	**WK15CM**	XNGU-MH	WK15CM
K3	XNPU-MM	WK15PM	**XNGU-MH**	**WP35CM**	XNGU-MH	WP35CM
N1–N2	XNGU-ALP	WN25PM	**XNGU-ALP**	**WN25PM**	XNGU-ALP	WN25PM
N3	XNGU-ALP	WN25PM	**XNGU-ALP**	**WN25PM**	XNGU-ALP	WN25PM
S1–S2	XNGU-ML	WP25PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
S3	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
S4	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
H1	XNGU-ML	WU10PM	**XNGU-MM**	**WU10PM**	–	–

VSM490-10 • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP25PM			WP35CM			WP40PM			WS40PM			WU10PM		
P	1	–	–	–	–	–	–	–	–	–	330	**285**	270	455	**395**	370	295	**260**	245	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	275	**240**	200	280	**255**	230	250	**215**	180	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	255	**215**	175	255	**230**	205	230	**195**	160	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	225	**185**	150	190	**175**	160	205	**170**	135	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–	185	**170**	150	260	**230**	210	170	**155**	135	170	**145**	120	–	–	–
	6	–	–	–	–	–	–	–	–	–	165	**125**	100	160	**135**	110	150	**115**	90	150	**110**	80	–	–	–
M	1	–	–	–	–	–	–	–	–	–	205	**180**	165	205	**185**	155	195	**170**	155	210	**170**	140	–	–	–
	2	–	–	–	–	–	–	–	–	–	185	**160**	130	185	**160**	140	175	**150**	125	180	**145**	120	–	–	–
	3	–	–	–	–	–	–	–	–	–	140	**120**	95	145	**130**	115	130	**115**	90	145	**110**	85	–	–	–
K	1	420	**385**	340	270	**245**	215	–	–	–	230	**205**	185	295	**265**	240	–	–	–	–	–	–	295	**265**	240
	2	335	**295**	275	210	**190**	175	–	–	–	180	**160**	150	235	**210**	190	–	–	–	–	–	–	230	**205**	190
	3	280	**250**	230	175	**160**	145	–	–	–	150	**135**	120	195	**175**	160	–	–	–	–	–	–	195	**175**	160
N	1	–	–	–	–	–	–	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	40	**35**	25	–	–	–
	2	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	40	**35**	25	–	–	–
	3	–	–	–	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	50	**40**	25	–	–	–
	4	–	–	–	–	–	–	–	–	–	70	**50**	35	–	–	–	–	–	–	60	**50**	30	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**130**	90

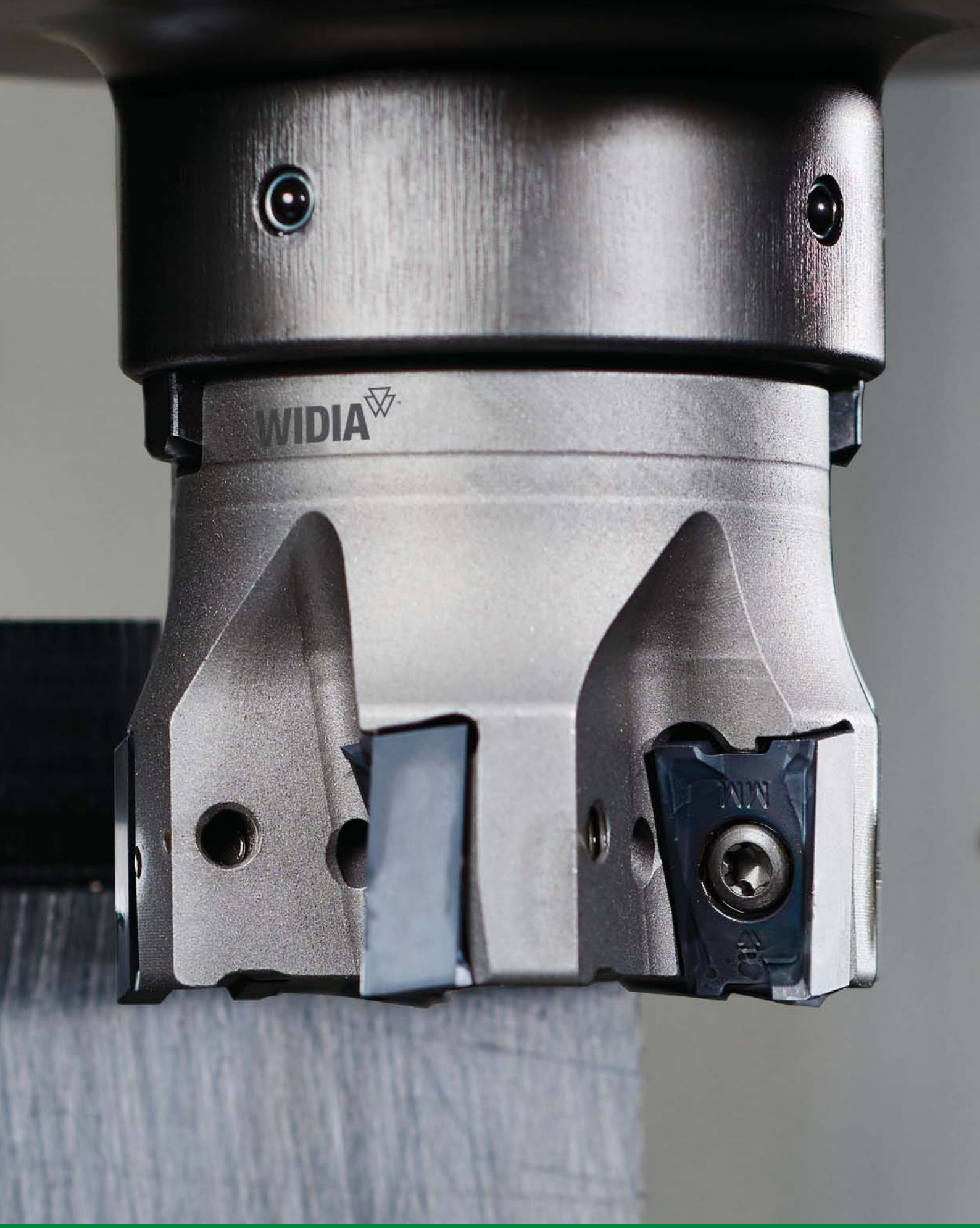
*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VSM490-10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.E..ALP	0,12	**0,23**	0,32	0,08	**0,17**	0,23	0,06	**0,13**	0,18	0,06	**0,11**	0,15	0,05	**0,10**	0,14	.E..ALP
.E..ML	0,18	**0,28**	0,37	0,13	**0,20**	0,27	0,10	**0,15**	0,20	0,09	**0,13**	0,17	0,08	**0,12**	0,16	.E..ML
.S..MM	0,23	**0,35**	0,46	0,17	**0,25**	0,33	0,13	**0,19**	0,25	0,11	**0,17**	0,22	0,10	**0,15**	0,20	.S..MM
.S..MH	0,23	**0,43**	0,58	0,17	**0,31**	0,42	0,13	**0,23**	0,31	0,11	**0,20**	0,27	0,10	**0,18**	0,25	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.



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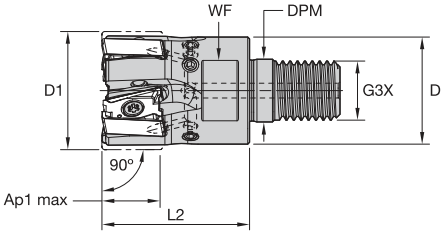
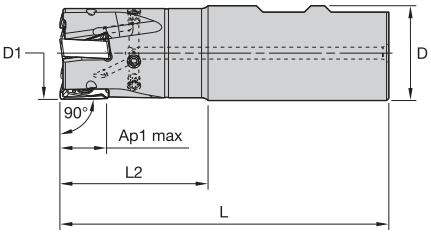
VSM490-15 • Screw-On End Mills • Metric



order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
5873211	VSM490D025Z02M12XN15	25	21	12,5	M12	32	17	15,0	2	26700	Yes	0,18
5873212	VSM490D032Z03M16XN15	32	29	17,0	M16	40	24	15,0	3	22000	Yes	0,18
5873213	VSM490D032Z04M16XN15	32	29	17,0	M16	40	24	15,0	4	22000	Yes	0,18
5873214	VSM490D035Z04M16XN15	35	29	17,0	M16	40	24	15,0	4	20600	Yes	0,19

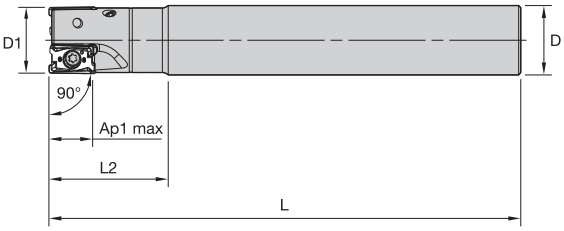
VSM490-15 • Weldon® End Mills • Metric



order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
5710285	VSM490D025Z02B25XN15	25	25	89	32	15,0	2	26700	Yes	0,28
5710286	VSM490D032Z03B32XN15	32	32	111	50	15,0	3	22000	Yes	0,58
5873215	VSM490D040Z03B32XN15	40	32	111	50	15,0	3	18800	Yes	0,65

NOTE: Weldon type not recommended for finishing operations.

VSM490-15 • Cylindrical End Mills • Metric



order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
5873216	VSM490D025Z02A25XN15L100	25	25	100	43	15,0	2	26700	Yes	0,32
5710287	VSM490D025Z02A25XN15L170	25	25	170	43	15,0	2	26700	Yes	0,59
5873217	VSM490D032Z03A32XN15L110	32	32	110	49	15,0	3	22000	Yes	0,59
5710288	VSM490D032Z03A32XN15L200	32	32	200	50	15,0	3	22000	Yes	1,14
5873218	VSM490D032Z04A32XN15L110	32	32	110	49	15,0	4	22000	Yes	0,58
5873219	VSM490D032Z04A32XN15L200	32	32	200	50	15,0	4	22000	Yes	1,14

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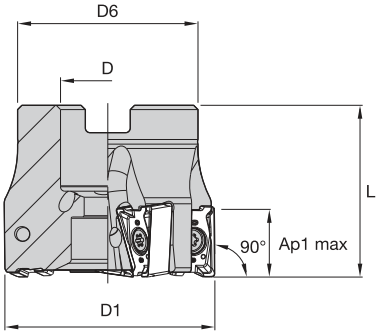
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

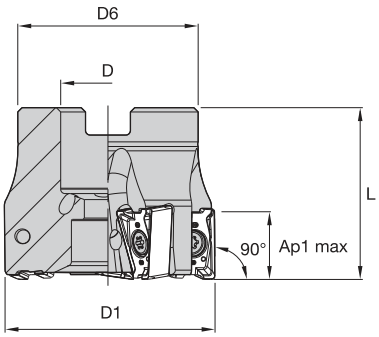
VSM490-15 • Shell Mills • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5710289	VSM490D040Z04S16XN15	40	16	37	40	15,0	4	18800	Yes	0,20
5710520	VSM490D040Z05S16XN15	40	16	37	40	15,0	5	18800	Yes	0,19
5873221	VSM490D050Z04S22XN15	50	22	42	40	15,0	4	16300	Yes	0,28
5710521	VSM490D050Z05S22XN15	50	22	42	40	15,0	5	16300	Yes	0,28
5710522	VSM490D050Z06S22XN15	50	22	42	40	15,0	6	16300	Yes	0,28
5873222	VSM490D063Z05S22XN15	63	22	50	40	15,0	5	14200	Yes	0,50
5710523	VSM490D063Z06S22XN15	63	22	50	40	15,0	6	14200	Yes	0,49
5710524	VSM490D063Z07S22XN15	63	22	50	40	15,0	7	14200	Yes	0,48
5873223	VSM490D080Z05S27XN15	80	27	60	50	15,0	5	12300	Yes	1,03
5710525	VSM490D080Z07S27XN15	80	27	60	50	15,0	7	12300	Yes	1,03
5873224	VSM490D080Z09S27XN15	80	27	60	50	15,0	9	12300	Yes	1,04
5710526	VSM490D100Z08S32XN15	100	32	80	50	15,0	8	10900	Yes	1,61
5873225	VSM490D100Z11S32XN15	100	32	80	50	15,0	11	10900	Yes	1,64
5873226	VSM490D125Z09S40XN15	125	40	90	63	15,0	9	9600	Yes	2,96
5873227	VSM490D125Z12S40XN15	125	40	90	63	15,0	12	9600	Yes	3,11
5873228	VSM490D160Z12S40XN15	160	40	110	63	15,0	12	8400	Yes	4,80

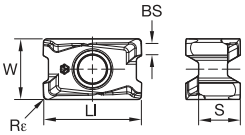
NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

VSM490-15 • Shell Mills • Japanese Industry Standard JIS • Metric



order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6342806	VSM490D080Z05S254XN15JIS	80	25,40	50	50	15,0	5	12300	Yes	0,89
6342807	VSM490D080Z07S254XN15JIS	80	25,40	50	50	15,0	7	12300	Yes	0,87
6342808	VSM490D100Z08S3175XN15JIS	100	31,76	60	50	15,0	8	10900	Yes	1,23
6342809	VSM490D125Z09S381XN15JIS	125	38,10	80	63	15,0	9	9600	Yes	2,81
6342810	VSM490D160Z12S508XN15JIS	160	50,80	100	63	15,0	12	8400	Yes	4,88

VSM490-15 • XNGU-ALP • For Aluminum and Other Non-Ferrous Alloys

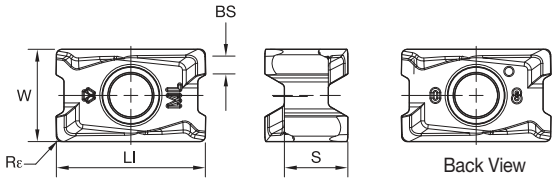


● first choice
○ alternate choice

P					●	●	●	●	●					
M					●	●	●	●	●					
K	●	●			○	○								
N				●				○						
S					●	○	○	●	●					
H					○									

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNGU15T604ERALP	4	16,20	6,88	10,00	2,20	0,40	0,03	-	-	6082644	-	-	-	-	-
XNGU15T608ERALP	4	16,20	6,88	10,00	1,80	0,80	0,03	-	-	6082645	-	-	-	-	-

VSM490-15 • XNGU-ML • Precision Finishing and Light Machining

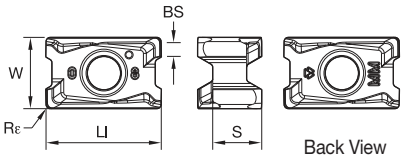


● first choice
○ alternate choice

P					●	●	●	●	●					
M					●	●	●	●	●					
K	●	●			○	○								
N				●				○						
S					●	○	○	●	●					
H					○									

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNGU15T604ERML	4	16,20	6,88	10,00	2,20	0,40	0,08	-	-	-	5890821	-	5890822	6180323	5890823
XNGU15T608ERML	4	16,20	6,88	10,00	1,80	0,80	0,08	-	6242523	-	5873481	-	5873482	6180324	5873483

VSM490-15 • XNGU-MM • Universal Geometry for Medium Machining

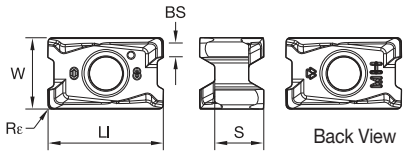


● first choice
○ alternate choice

		WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
P					●	●	●	●	●
M					●	●	●	●	●
K		●	●		○	○			
N				●				○	
S					●	○	○	●	●
H					○				

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNGU15T604SRMM	4	16,20	6,88	10,00	2,20	0,40	0,10	-	6242521	-	5949204	-	5949205	-	5949206
XNGU15T608SRMM	4	16,20	6,88	10,00	1,90	0,80	0,10	-	6242522	-	5710527	-	5710528	-	5710529
XNGU15T612SRMM	4	16,20	6,88	10,00	1,50	1,20	0,08	6234707	-	-	-	-	-	-	-

VSM490-15 • XNGU-MH • Heavy Roughing

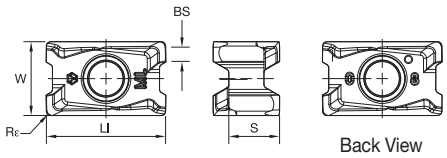


● first choice
○ alternate choice

		WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
P					●	●	●	●	●
M					●	●	●	●	●
K		●	●		○	○			
N				●				○	
S					●	○	○	●	●
H					○				

ISO catalogue number	cutting edges	Ll	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNGU15T608SRMH	4	16,20	6,88	10,00	1,80	0,80	0,10	6003725	6003724	-	6003570	6003723	6003721	-	6003722
XNGU15T616SRMH	4	16,20	6,88	10,00	1,00	1,60	0,10	6030380	6030378	-	6030376	6030377	-	-	-

VSM490-15 • XNPU-ML • Light Machining

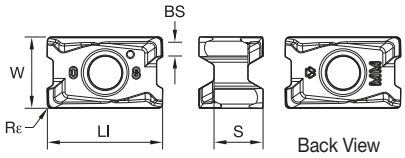


● first choice
○ alternate choice

P					●	●	●	●	●
M					●	●	●	●	●
K	●	●			○	○			
N				●				○	
S					●	○	○	●	●
H					○				

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNPU15T608ERML	4	16,10	6,88	10,00	1,90	0,80	0,08	-	-	-	5883097	-	5883098	-	5883099

VSM490-15 • XNPU-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

P					●	●	●	●	●
M					●	●	●	●	●
K	●	●			○	○			
N				●				○	
S					●	○	○	●	●
H					○				

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNPU15T608SRMM	4	16,10	6,88	10,00	1,90	0,80	0,10	5873420	5873419	-	5873415	5873418	5873416	6180320	5873417
XNPU15T612SRMM	4	16,10	6,88	10,00	1,50	1,20	0,10	5890763	5890762	-	5890728	5890761	5890729	6180321	5890730
XNPU15T616SRMM	4	16,10	6,88	10,00	1,10	1,60	0,10	5883522	5883521	-	5883447	5883450	5883448	6180322	5883449
XNPU15T620SRMM	4	16,10	6,88	10,00	0,70	2,00	0,10	6030375	-	-	6030372	6030374	6030373	-	-

VSM490-15 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XNGU-ML	WP40PM	**XNPU-MM**	**WP40PM**	XNPU-MM	WP40PM
P3–P4	XNGU-ML	WP40PM	**XNPU-MM**	**WP40PM**	XNPU-MM	WP40PM
P5–P6	XNGU-MM	WP25PM	**XNPU-MM**	**WP35CM**	XNPU-MM	WP40PM
M1–M2	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
M3	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
K1–K2	XNPU-MM	WK15PM	**XNGU-MH**	**WK15CM**	XNGU-MH	WK15CM
K3	XNPU-MM	WK15PM	**XNGU-MH**	**WP35CM**	XNGU-MH	WP35CM
N1–N2	XNGU-ALP	WN25PM	**XNGU-ALP**	**WN25PM**	XNGU-ALP	WN25PM
N3	XNGU-ALP	WN25PM	**XNGU-ALP**	**WN25PM**	XNGU-ALP	WN25PM
S1–S2	XNGU-ML	WP25PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
S3	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
S4	XNGU-ML	WS40PM	**XNGU-ML**	**WS40PM**	XNPU-MM	WS40PM
H1	–	–	**–**	**–**	–	–

VSM490-15 • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP25PM			WP35CM			WP40PM			WS40PM			WU35PM		
P	1	–	**–**	–	–	**–**	–	–	**–**	–	330	**285**	270	455	**395**	370	295	**260**	245	–	**–**	–	260	**230**	215
	2	–	**–**	–	–	**–**	–	–	**–**	–	275	**240**	200	280	**255**	230	250	**215**	180	–	**–**	–	220	**190**	160
	3	–	**–**	–	–	**–**	–	–	**–**	–	255	**215**	175	255	**230**	205	230	**195**	160	–	**–**	–	200	**170**	140
	4	–	**–**	–	–	**–**	–	–	**–**	–	225	**185**	150	190	**175**	160	205	**170**	135	–	**–**	–	180	**150**	120
	5	–	**–**	–	–	**–**	–	–	**–**	–	185	**170**	150	260	**230**	210	170	**155**	135	170	**145**	120	150	**135**	120
	6	–	**–**	–	–	**–**	–	–	**–**	–	165	**125**	100	160	**135**	110	150	**115**	90	150	**110**	80	130	**100**	80
M	1	–	**–**	–	–	**–**	–	–	**–**	–	205	**180**	165	205	**185**	155	195	**170**	155	210	**170**	140	170	**150**	135
	2	–	**–**	–	–	**–**	–	–	**–**	–	185	**160**	130	185	**160**	140	175	**150**	125	180	**145**	120	155	**130**	110
	3	–	**–**	–	–	**–**	–	–	**–**	–	140	**120**	95	145	**130**	115	130	**115**	90	145	**110**	85	115	**100**	80
K	1	420	**385**	340	270	**245**	215	–	**–**	–	230	**205**	185	295	**265**	240	–	**–**	–	–	**–**	–	–	**–**	–
	2	335	**295**	275	210	**190**	175	–	**–**	–	180	**160**	150	235	**210**	190	–	**–**	–	–	**–**	–	–	**–**	–
	3	280	**250**	230	175	**160**	145	–	**–**	–	150	**135**	120	195	**175**	160	–	**–**	–	–	**–**	–	–	**–**	–
N	1	–	**–**	–	–	**–**	–	1075	**945**	875	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	945	**875**	760	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	945	**875**	760	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–	40	**35**	25	–	**–**	–	–	**–**	–	40	**35**	25	35	**30**	25
	2	–	**–**	–	–	**–**	–	–	**–**	–	40	**35**	25	–	**–**	–	–	**–**	–	40	**35**	25	35	**30**	25
	3	–	**–**	–	–	**–**	–	–	**–**	–	50	**40**	25	–	**–**	–	–	**–**	–	50	**40**	25	45	**35**	25
	4	–	**–**	–	–	**–**	–	–	**–**	–	70	**50**	35	–	**–**	–	–	**–**	–	60	**50**	30	60	**45**	30
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VSM490-15 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
.E..ALP	0,11	**0,23**	0,35	0,08	**0,17**	0,25	0,06	**0,13**	0,19	0,05	**0,11**	0,16	0,05	**0,10**	0,15	.E..ALP
.E..ML	0,17	**0,31**	0,46	0,13	**0,23**	0,33	0,09	**0,17**	0,25	0,08	**0,15**	0,22	0,08	**0,14**	0,20	.E..ML
.S..MM	0,22	**0,40**	0,64	0,16	**0,29**	0,46	0,12	**0,22**	0,34	0,10	**0,19**	0,30	0,10	**0,18**	0,28	.S..MM
.S..MH	0,23	**0,45**	0,74	0,17	**0,33**	0,54	0,13	**0,24**	0,40	0,11	**0,21**	0,35	0,10	**0,20**	0,32	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.

VSM890™

VSM890 Shoulder Mill

Use VSM890 shoulder mills to perform a true 90-degree wall and axial step down in light machining to heavy roughing jobs while maintaining a smooth surface finish in all material groups.

Course, medium, and fine-pitched cutter densities.

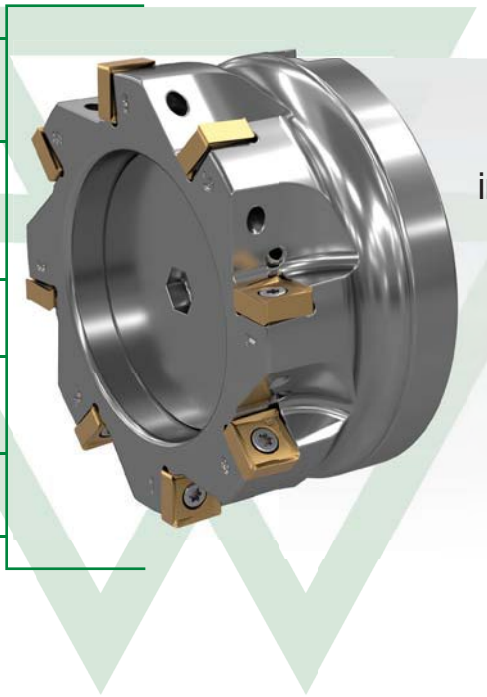
Pocket seat designed for tight insert seating, enabling stability in roughing applications.

Ap1 Max up to 9,8mm.

User-friendly pocket numbering system.

Integrated wiper facet.

Super-positive rake design for low machine power consumption.



VSM890 shoulder mills feature an internal coolant supply and an enhanced user-friendly design with a pocket numbering system. Each insert is double-sided with eight cutting edges and an insert nose radius of radii 0,8 and 1,6 mm, creating no lap lines in step down contour milling jobs.

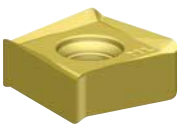
UNIQUE INSERT RAKE DESIGN TO REDUCE AND PERFECTLY BALANCE AXIAL AND RADIAL CUTTING FORCES. ENGINEERED FOR LIGHT MACHINING TO HEAVY ROUGHING IN ALL MATERIAL GROUPS.

-ALP

N

First choice for non-ferrous materials.

-ML



P M S

First choice for stainless steel, light machining, and finishing jobs.

-MM

P M K S H

First choice for general purpose in all workpiece materials. Engineered for high-feed rates.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

TRUE 90-DEGREE WALL AND AXIAL STEP DOWN WITH VSM890™

PRODUCT

SERIES

VSM890

DIAMETER RANGE

Weldon End Mills: 32mm
Shell Mills: 40–250mm

SHANK TYPES

Weldon® End Mills
Shell Mills

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

ENERGY

APPLICATIONS

FACE MILLING

SIDE/ SHOULDER MILLING: SLOTTING: SHOULDER

SLOTTING: TROCHOIDAL MILLING

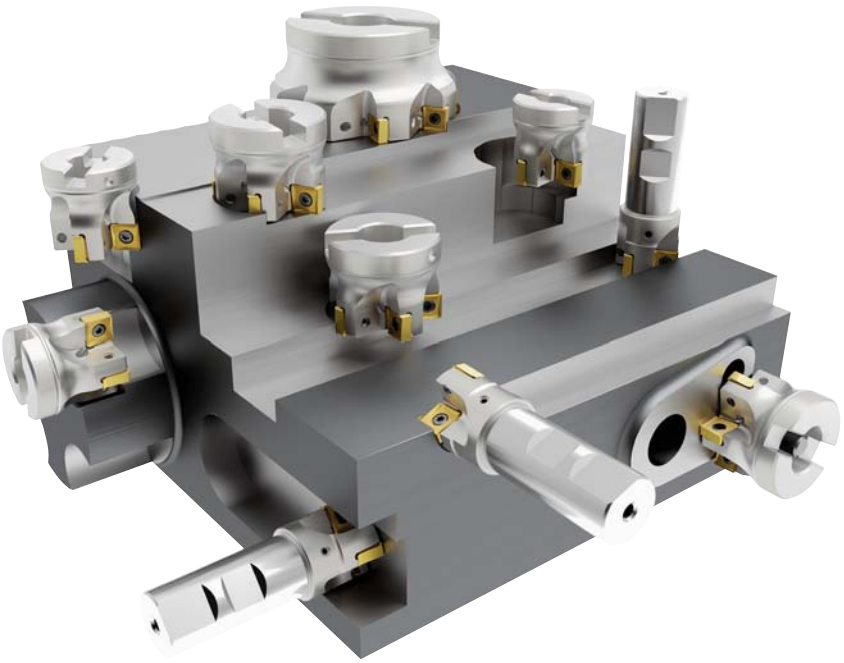
PLUNGE MILLING

SLOTTING: SQUARE END

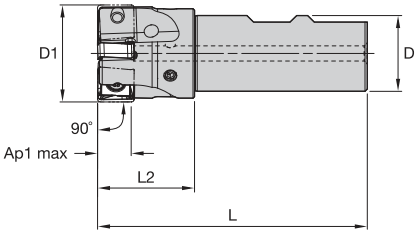
POCKET MILLING

VERSATILITY

Apply VSM890 in a variety of applications.

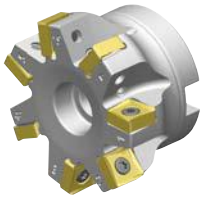


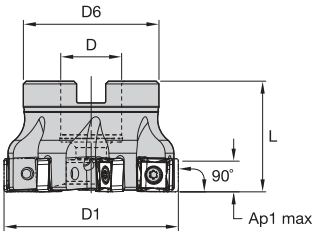
VSM890-12 • Weldon® End Mills • Metric



order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6596066	VSM890D032Z03B25SN12	32	25	89	32	9,8	3	33200	Yes	0,31

VSM890-12 • Shell Mills • Metric



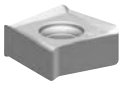


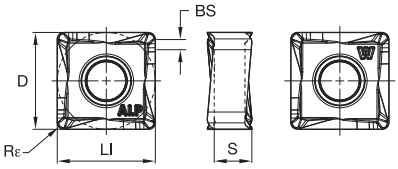
order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6596067	VSM890D040Z04S22SN12	40	22	39	40	9,8	4	28000	Yes	0,20
6596068	VSM890D050Z04S22SN12	50	22	49	40	9,8	4	24100	Yes	0,32
6596069	VSM890D050Z05S22SN12	50	22	49	40	9,8	5	24100	Yes	0,32
6596070	VSM890D063Z05S22SN12	63	22	49	40	9,8	5	20800	Yes	0,48
6596111	VSM890D063Z07S22SN12	63	22	49	40	9,8	7	20800	Yes	0,45
6596112	VSM890D080Z05S27SN12	80	27	60	50	9,8	5	18000	Yes	0,96
6596113	VSM890D080Z07S27SN12	80	27	60	50	9,8	7	18000	Yes	1,03
6596114	VSM890D080Z09S27SN12	80	27	60	50	9,8	9	18000	Yes	1,01
6596115	VSM890D100Z06S32SN12	100	32	78	50	9,8	6	15800	Yes	1,69
6596116	VSM890D100Z08S32SN12	100	32	78	50	9,8	8	15800	Yes	1,56
6596117	VSM890D100Z11S32SN12	100	32	78	50	9,8	11	15800	Yes	1,53
6596118	VSM890D125Z07S40SN12	125	40	89	63	9,8	7	13900	Yes	2,79
6596119	VSM890D125Z10S40SN12	125	40	89	63	9,8	10	13900	Yes	2,98
6596121	VSM890D125Z14S40SN12	125	40	89	63	9,8	14	13900	Yes	2,86
6596122	VSM890D160Z08S40SN12	160	40	110	63	9,8	8	12200	Yes	4,10
6596123	VSM890D160Z12S40SN12	160	40	110	63	9,8	12	12200	Yes	4,15
6596124	VSM890D160Z16S40SN12	160	40	110	63	9,8	16	12200	Yes	8,97
6596125	VSM890D200Z10S60SN12	200	60	130	63	9,8	10	10800	Yes	5,62
6596126	VSM890D200Z14S60SN12	200	60	130	63	9,8	14	10800	Yes	5,59
6596127	VSM890D200Z22S60SN12	200	60	130	63	9,8	22	10800	Yes	5,67
6596128	VSM890D250Z16S60SN12	250	60	130	63	9,8	16	9600	Yes	8,10

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM890-12 • SNHX-ALP • For Aluminum and Other Non-Ferrous Alloys



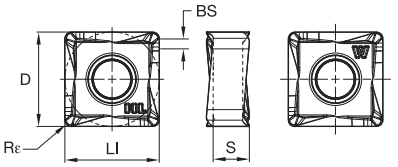


● first choice
○ alternate choice

P			●	●	●	●	
M			●	●	●	●	
K	●		○	○			●
N		●				○	
S			●	○	○	●	
H			○				●

ISO catalogue number	cutting edges	LI	S	D	BS	Rε	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
SNHX120408PNERALP	8	12,00	4,61	12,00	1,34	0,80	-	6596397	-	-	-	-	-

VSM890-12 • SNHX-ML • Precision Finishing and Light Machining

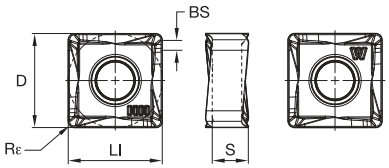


● first choice
○ alternate choice

P			●	●	●	●	
M			●	●	●	●	
K	●		○	○			●
N		●				○	
S			●	○	○	●	
H			○				●

ISO catalogue number	cutting edges	LI	S	D	BS	Rε	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
SNHX120408PNERML	8	12,00	4,61	12,00	1,34	0,80	-	-	6596398	-	-	6596399	-

VSM890-12 • SNHX-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

P			●	●	●	●	
M			●	●	●	●	
K	●		○	○			●
N		●				○	
S			●	○	○	●	
H			○				●

ISO catalogue number	cutting edges	LI	S	D	BS	Rε	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
SNHX120408PNSRMM	8	12,00	4,61	12,00	1,34	0,80	6667462	-	6596431	6797597	6596432	6596433	6596400
SNHX120416PNSRMM	8	12,00	4,58	12,00	1,00	1,60	6712874	-	6712875	-	6712876	6712877	-

VSM890-12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	SNHX-ML	WS40PM	**SNHX-MM**	**WP40PM**	SNHX-MM	WP40PM
P3–P4	SNHX-ML	WS40PM	**SNHX-MM**	**WP40PM**	SNHX-MM	WP40PM
P5–P6	SNHX-ML	WP25PM	**SNHX-MM**	**WP40PM**	SNHX-MM	WP40PM
M1–M2	SNHX-ML	WS40PM	**SNHX-ML**	**WS40PM**	SNHX-MM	WS40PM
M3	SNHX-ML	WS40PM	**SNHX-ML**	**WS40PM**	SNHX-MM	WS40PM
K1–K2	SNHX-MM	WK15CM	**SNHX-MM**	**WK15CM**	SNHX-MM	WK15CM
K3	SNHX-MM	WK15CM	**SNHX-MM**	**WK15CM**	SNHX-MM	WK15CM
N1–N2	SNHX-ALP	WN25PM	**SNHX-ALP**	**WN25PM**	SNHX-ALP	WN25PM
N3	SNHX-ALP	WN25PM	**SNHX-ALP**	**WN25PM**	SNHX-ALP	WN25PM
S1–S2	SNHX-ML	WP25PM	**SNHX-ML**	**WS40PM**	SNHX-MM	WS40PM
S3	SNHX-ML	WS40PM	**SNHX-ML**	**WS40PM**	SNHX-MM	WS40PM
S4	SNHX-ML	WS40PM	**SNHX-ML**	**WS40PM**	SNHX-MM	WS40PM
H1	SNHX-MM	WU10PM	**SNHX-MM**	**WU10PM**	–	–

VSM890-12 • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WN25PM			WP25PM			WP35CM			WP40PM			WS40PM			WU10PM		
P	1	–	–	–	–	–	–	330	**285**	270	455	**395**	370	295	**260**	245	–	–	–	–	–	–
	2	–	–	–	–	–	–	275	**240**	200	280	**255**	230	250	**215**	180	–	–	–	–	–	–
	3	–	–	–	–	–	–	255	**215**	175	255	**230**	205	230	**195**	160	–	–	–	–	–	–
	4	–	–	–	–	–	–	225	**185**	150	190	**175**	160	205	**170**	135	–	–	–	–	–	–
	5	–	–	–	–	–	–	185	**170**	150	260	**230**	210	170	**155**	135	170	**145**	120	–	–	–
	6	–	–	–	–	–	–	165	**125**	100	160	**135**	110	150	**115**	90	150	**110**	80	–	–	–
M	1	–	–	–	–	–	–	205	**180**	165	205	**185**	155	195	**170**	155	210	**170**	140	–	–	–
	2	–	–	–	–	–	–	185	**160**	130	185	**160**	140	175	**150**	125	180	**145**	120	–	–	–
	3	–	–	–	–	–	–	140	**120**	95	145	**130**	115	130	**115**	90	145	**110**	85	–	–	–
K	1	420	**385**	340	–	–	–	230	**205**	185	295	**265**	240	–	–	–	–	–	–	295	**265**	240
	2	335	**295**	275	–	–	–	180	**160**	150	235	**210**	190	–	–	–	–	–	–	230	**205**	190
	3	280	**250**	230	–	–	–	150	**135**	120	195	**175**	160	–	–	–	–	–	–	195	**175**	160
N	1	–	–	–	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	40	**35**	25	–	–	–
	2	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	40	**35**	25	–	–	–
	3	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	50	**40**	25	–	–	–
	4	–	–	–	–	–	–	70	**50**	35	–	–	–	–	–	–	60	**50**	30	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**130**	90

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VSM890-12 • Recommended Starting Feeds [mm]

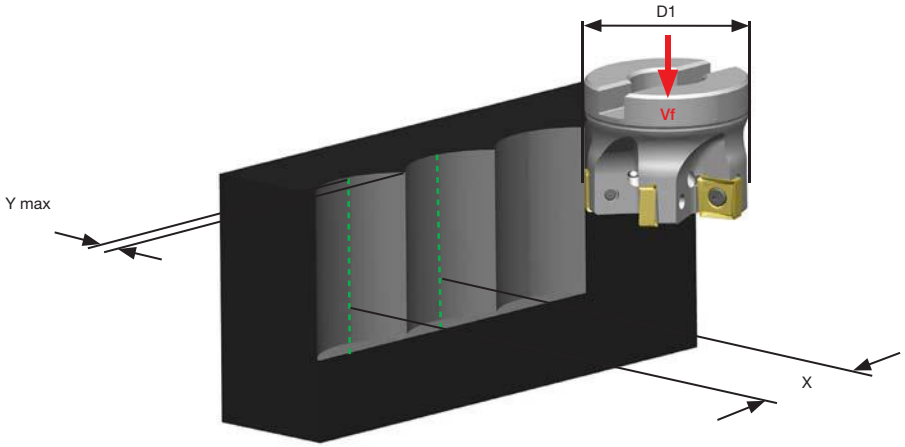
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..ALP	0,12	**0,28**	0,43	0,08	**0,20**	0,31	0,06	**0,15**	0,23	0,06	**0,13**	0,20	0,05	**0,12**	0,18	.E..ALP
.E..ML	0,17	**0,32**	0,60	0,13	**0,23**	0,44	0,09	**0,18**	0,33	0,08	**0,15**	0,28	0,08	**0,14**	0,26	.E..ML
.S..MM	0,23	**0,36**	0,82	0,17	**0,26**	0,59	0,13	**0,20**	0,44	0,11	**0,17**	0,38	0,10	**0,16**	0,35	.S..MM

NOTE: Use "Light Machining" value as starting feed rate.

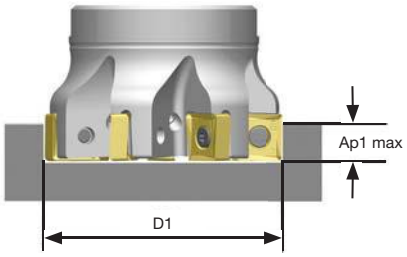
VSM890-12 Z-Axis Plunge Milling

cutting diameter (D1)	Y max	X
32	8,9	28,68
40	8,9	33,27
50	8,9	38,25
63	8,9	43,89
80	8,9	50,31
100	8,9	56,95
125	8,9	64,29
160	8,9	73,34
200	8,9	82,48
250	8,9	92,65



VSM890-12 Ap1 max at Full Slotting, 100% Radial Cutter Engagement

	Recommended Cutter Density	Ap1 max		
D1 diameter	Z	Gray Cast Iron EN-GJL-250 EN-JL1040 GG25	Steel AISI 4140 1.7225 42CrMo4	Stainless Steel AISI 316L, 1.4404, X2CrNiMo1810
40	4	8,0	6,5	5,0
50	4	8,0	6,5	5,0
63	5	8,0	6,5	5,0
80	5	8,0	6,5	5,0
100	6	8,0	6,5	5,0



M680 Series

M680-09, M680-16, M680+ Shoulder Mills

M680-09

The M680-09 shoulder mill provides the length needed to machine deep cavities or wall machines. The axially positive geometry makes this tool suitable for unstable conditions.

M680-16

The M680-16 is a versatile 90° shoulder mill with optimized strong tool design for challenging milling operations. A wide selection of inserts are available to machine all material types.

M680+

The M680+ is a general purpose shoulder mill that features strong inserts for high reliability in roughing applications and interrupted cuts.

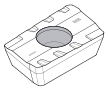
M680 TO M680-16

AL

Additional choice for aluminum and non-ferrous alloy machining.

XP..16..

First choice for general machining operations in steel and cast iron.



MR

First choice for heavy machining and unstable conditions (e.g., long reach).

M680-09

-XDHT

Versatile choice for general machining operations in steel, stainless steel, cast iron, non-ferrous, high-temp alloys, and hardened materials.

-MM

First choice for general machining in steel and cast iron.

WIDE RANGE OF INSERTS FOR OPTIMAL PERFORMANCE

PRODUCT		INSERTS		
SERIES	DIAMETER RANGE	INSERT TYPES	GRADE	MATERIALS
M680-09	16–32mm	XDHT, MM	WK15PM, WU20PM	P M K N S H
M680-16	16–160mm	ALP, AL, GE, XP..16, MR	THR, THM-U, TN6501, TN6502, TN6510, TN6520, TN6525, TN6540, TTM08, WK15PM, WP35CM, WU20PM, TTI25, THM, WK15CM, WP40PM, WS30PM	P M K N S H
M680+	25–40mm	ML, MM, MH	THM, TN6510, TN6520, TN6540, WK15CM, WP35CM	P M K N S

APPLICATIONS

- SIDE MILLING/ SHOULDER MILLING: SQUARE END
- SLOTTING: SQUARE END
- FACE MILLING
- THROUGH COOLANT: RADIAL: INDEXABLE MILLING
- SLOTTING: SIDE MILLING
- PLUNGE MILLING
- POCKETING
- RAMPING: BLANK

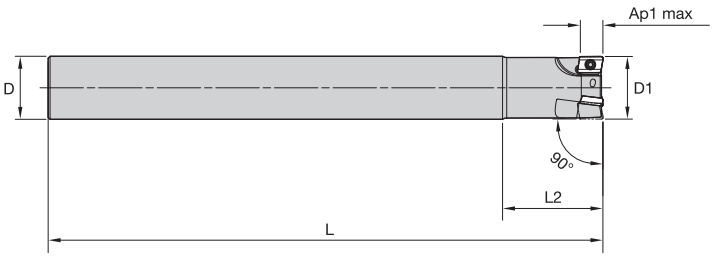
INDUSTRY

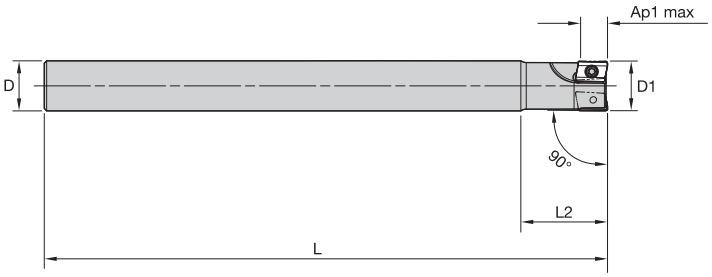
TRANSPORTATION

AEROSPACE

GENERAL ENGINEERING

M680-09 • Cylindrical End Mills • XD09 • Metric





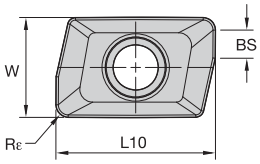
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2582447	**M680D016Z02A16XD09L180**	16	16	180	26	9,0	2	22000	No	0,27
2582446	**M680D020Z02A20XD09L200**	20	20	200	31	9,0	2	19700	No	0,47
2582445	**M680D025Z03A25XD09L220**	25	25	220	37	9,0	3	17630	No	0,80
2582441	**M680D032Z04A32XD09L250**	32	32	250	38	9,0	4	15580	No	1,51

NOTE: Please order wrench separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M680-09 • XDHT

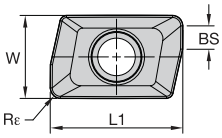


● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XDHT090304	2	6,35	9,18	3,18	0,37	0,40	0,05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2568226
XDHT090308	2	6,35	9,47	3,18	1,00	0,80	0,04	2025281	–	–	–	–	–	–	–	–	2028938	2028940	–	–	6843556	–	–	–
XDHT090308	2	6,35	9,48	3,18	1,00	0,80	0,04	–	–	–	–	–	–	–	–	–	–	–	6724746	–	–	–	–	–
XDHT090312	2	6,35	9,00	3,18	0,61	1,20	0,05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4113802
XDHT090316	2	6,35	8,96	3,18	–	1,60	0,05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3954913
XDHT090320	2	6,35	8,88	3,18	–	2,00	0,05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2634307

M680-09 • XDMT-MM

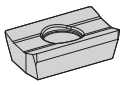


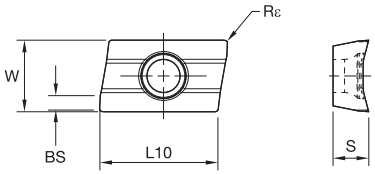
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XDMT090308PZSRMM	2	9,88	3,18	2,52	0,80	0,04	'	'	'	'	'	'	'	'	'	'	'	'	6870182	'	'	'	'
XDMT090308PZSRMM	2	9,88	3,18	2,52	0,80	0,05	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	4041195

M680-09 • XDHT-AL





● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XDHT090308AL	2	6,71	9,46	3,08	1,00	0,80	0,02	2031793	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'

M680-09 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.XDHT..	WU20PM	**.XDHT..**	**WU20PM**	..SRMM	WU20PM
P3–P4	.XDHT..	WU20PM	**.XDHT..**	**WU20PM**	..SRMM	WU20PM
P5–P6	.XDHT..	WU20PM	**..SRMM**	**WU20PM**	..SRMM	WU20PM
M1–M2	.XDHT..	WU20PM	**.XDHT..**	**WU20PM**	..SRMM	WU20PM
M3	.XDHT..	WU20PM	**..SRMM**	**WU20PM**	..SRMM	WU20PM
K1–K2	.XDHT..	WK15CM	**.XDHT..**	**WK15CM**	..SRMM	WK15PM
K3	.XDHT..	WK15CM	**..SRMM**	**WK15PM**	..SRMM	WK15PM
N1–N2	.XDHT..	WU20PM	**.XDHT..**	**WU20PM**	.XDHT..	WU20PM
N3	.XDHT..	WU20PM	**.XDHT..**	**WU20PM**	..SRMM	WU20PM
S1–S2	.XDHT..	WU20PM	**.XDHT..**	**WU20PM**	..SRMM	WU20PM
S3	.XDHT..	WU20PM	**..SRMM**	**WU20PM**	..SRMM	WU20PM
S4	..SRMM	WU20PM	**..SRMM**	**WU20PM**	..SRMM	WU20PM
H1	.XDHT..	WU20PM	**–**	**–**	–	–

M680-09 • Recommended Starting Feeds [mm]

Material Group		THR			THM-U			TN6501			TN6502			TN6510			TN6520			TN6525			TN6540		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	265	**210**	180	210	**160**	140
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	235	**180**	155	180	**140**	115
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	195	**140**	120	150	**110**	90
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	260	**195**	165	200	**150**	125
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	170	**135**	110	135	**100**	85
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**100**	65	110	**65**	50
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	**65**	40	65	**40**	35
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	105	**65**	45	70	**40**	35
K	1	150	**135**	120	190	**170**	150	–	–	–	–	–	–	400	**290**	215	375	**265**	190	230	**205**	185	185	**170**	150
	2	185	**140**	120	–	–	–	–	–	–	–	–	–	350	**235**	170	325	**210**	160	180	**160**	150	145	**130**	115
	3	105	**75**	50	–	–	–	–	–	–	–	–	–	280	**215**	165	250	**190**	135	150	**135**	120	130	**120**	105
N	1	900	**600**	500	2000	**1200**	1000	2000	**1200**	1000	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	1365	**815**	665	1365	**815**	665	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	800	**500**	400	800	**500**	400	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–
S	1	35	**25**	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**30**	25
	2	25	**20**	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	**15**	10
	3	50	**40**	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	**35**	25
	4	35	**25**	18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**25**	20
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TTM08			WK15PM			WP35CM			WU20PM			TTI25			THM			WK15CM			WP40PM			WS30PM		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	1	230	**200**	190	–	–	–	455	**395**	370	330	**290**	270	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	2	195	**170**	140	–	–	–	280	**255**	230	275	**250**	200	260	**210**	180	–	–	–	–	–	–	250	**215**	180	–	–	–
	3	180	**150**	125	–	–	–	255	**230**	205	255	**220**	175	260	**210**	180	–	–	–	–	–	–	230	**195**	160	–	–	–
	4	160	**130**	105	–	–	–	190	**175**	160	225	**190**	150	220	**180**	150	–	–	–	–	–	–	205	**170**	135	–	–	–
	5	–	–	–	–	–	–	260	**230**	210	185	**175**	150	265	**195**	165	–	–	–	–	–	–	170	**155**	135	–	–	–
	6	–	–	–	–	–	–	160	**135**	110	165	**130**	100	120	**90**	75	–	–	–	–	–	–	150	**115**	90	–	–	–
M	1	–	–	–	–	–	–	205	**185**	155	205	**180**	165	400	**260**	180	–	–	–	–	–	–	195	**170**	155	225	**200**	185
	2	–	–	–	–	–	–	185	**160**	140	185	**160**	130	270	**170**	120	–	–	–	–	–	–	175	**150**	125	205	**180**	145
	3	–	–	–	–	–	–	145	**130**	115	140	**120**	95	265	**175**	120	–	–	–	–	–	–	130	**115**	90	155	**135**	105
K	1	–	–	–	400	**290**	215	295	**265**	240	250	**220**	185	185	**155**	130	–	–	–	420	**385**	340	–	–	–	–	–	–
	2	–	–	–	350	**235**	170	235	**210**	190	200	**180**	150	150	**120**	105	–	–	–	335	**295**	275	–	–	–	–	–	–
	3	–	–	–	280	**215**	165	195	**175**	160	180	**150**	120	120	**105**	85	–	–	–	280	**250**	230	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	400	**350**	300	–	–	–	560	**485**	420	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	2	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	3	–	–	–	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**45**	30
	4	–	–	–	–	–	–	66	**50**	33	70	**50**	35	–	–	–	–	–	–	–	–	–	65	**50**	35	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	110	**80**	70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

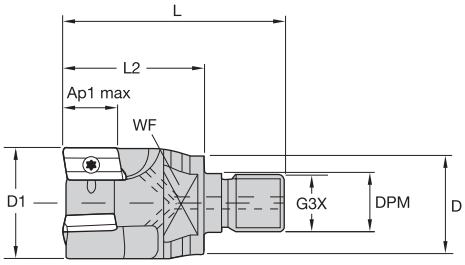
M680-09 • Recommended Starting Speeds [m/min]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.XDHT..	0,15	**0,43**	0,65	0,11	**0,30**	0,46	0,08	**0,23**	0,34	0,07	**0,20**	0,30	0,06	**0,18**	0,27	.XDHT..
..SRMM	0,16	**0,48**	0,73	0,12	**0,34**	0,51	0,09	**0,25**	0,38	0,08	**0,22**	0,33	0,07	**0,20**	0,30	..SRMM

NOTE: Use "Light Machining" value as starting feed rate.

M680-16 • Screw-On End Mills • Metric

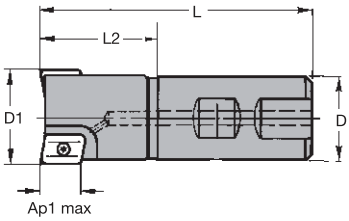


Insert Style XP.T16

order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
2003477	**12396932600**	25	24	12,5	M12	52	30	19	14,0	2	8800	Yes	0,2
2003517	**12396933000**	32	28	17,0	M16	63	40	22	14,0	3	7800	Yes	0,3
2003521	**12396933200**	35	28	17,0	M16	63	40	22	14,0	3	7200	Yes	0,3
2003540	**12396933400**	40	28	17,0	M16	63	40	22	14,0	4	7000	Yes	0,3

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.

M680-16 • Weldon® End Mills • Metric

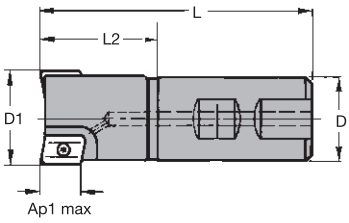


Insert Style XP.T16

order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2003475	**12396922600**	25	25	96	39	14,0	2	17600	Yes	0,3
2003515	**12396923000**	32	32	100	39	15,4	3	15600	Yes	0,5
2003539	**12396923400**	40	32	110	50	14,0	4	14000	Yes	0,8

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.

M680-16 • Weldon End Mills • Metric



Insert Style XD.T09

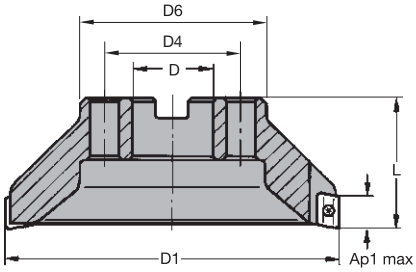
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2002366	**12396920400**	16	16	75	27	9,0	2	28000	No	0,10
2002369	**12396920600**	20	20	82	32	9,0	2	27000	Yes	0,30

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M680-16 • Shell Mills • Metric

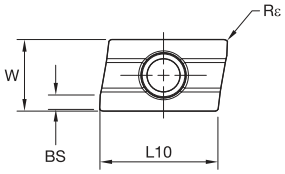
Insert Style XP.T16



order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003535	**12396903600**	40	22	—	39	45	15,3	4	14000	Yes	0,2
2003553	**12396903800**	50	22	—	42	40	14,0	4	12500	Yes	0,3
2003554	**12396904000**	50	22	—	42	40	14,0	5	12500	Yes	0,3
2003561	**12396904200**	63	22	—	50	40	14,0	5	11000	Yes	0,5
2003578	**12396904600**	80	27	—	60	50	14,0	6	9500	Yes	1,0
2003594	**12396905000**	100	32	—	78	50	14,0	8	8500	No	1,4
2003681	**12396905400**	125	40	—	89	63	14,0	9	7500	No	2,6
2003782	**12396905800**	160	40	66,7	90	63	14,0	12	7000	No	3,4

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.

M680-16 • XPHT-AL

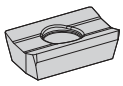


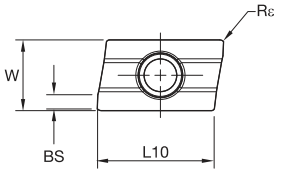
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160408AL	2	9,80	15,67	4,66	1,70	0,80	0,08	2031796	-	-	-	2963902	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160412AL	2	9,80	15,67	4,66	1,40	1,20	0,08	2031798	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160416AL	2	9,80	15,67	4,66	0,90	1,60	0,08	2031801	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160420AL	2	9,80	15,67	4,66	1,20	2,00	0,08	2031802	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160425AL	2	9,80	15,67	4,66	1,20	2,50	0,08	2029067	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160432AL	2	9,80	15,67	4,66	1,20	3,18	0,08	2031804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160440AL	2	9,80	15,67	4,66	1,20	4,00	0,08	2029073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

M680-16 • XPHT-ALP



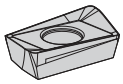


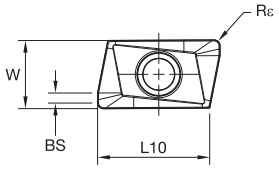
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160404ALP	2	9,80	15,67	4,66	1,70	0,40	0,08	-	2031794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160408ALP	2	9,80	15,67	4,66	1,70	0,80	0,08	-	2031797	-	2964136	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160412ALP	2	9,80	15,67	4,66	1,40	1,20	0,08	-	2031799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

M680-16 • XPHT-GE



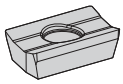


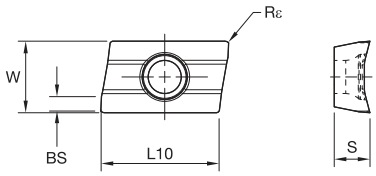
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160408ERGE	2	9,44	15,67	4,76	1,80	0,80	0,12	-	-	-	-	-	2964172	-	-	2964170	2405344	-	5427399	-	-	-	5519888	-
XPHT160408ERGE	2	9,44	15,67	4,76	1,80	0,80	0,12	-	-	-	-	-	-	-	2964176	-	-	-	-	-	-	-	-	-
XPHT160408ERGE	2	9,44	15,67	4,76	1,80	0,80	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843937	-	-	-
XPHT160412ERGE	2	9,44	15,67	4,76	1,50	1,20	0,12	-	-	-	-	-	-	2964173	2964175	2964179	-	-	5427420	-	-	-	-	-
XPHT160412ERGE	2	9,44	15,67	4,76	1,50	1,20	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843938	-	-	-

M680-16 • XPHT





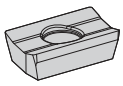
● first choice
○ alternate choice

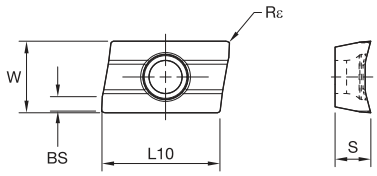
	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160404	2	9,53	15,67	4,76	2,17	0,40	0,16	-	-	-	-	-	-	-	-	-	-	-	6103458	-	-	-	-	-
XPHT160408	2	9,53	15,67	4,76	1,80	0,80	0,16	-	-	-	-	-	-	2964168	-	2964164	-	-	5427389	-	-	5645177	-	2562061
XPHT160408	2	9,53	15,67	4,76	1,80	0,80	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843991	-	-	-
XPHT160412	2	9,53	15,67	4,76	1,50	1,20	0,16	-	-	2029049	-	-	-	-	-	-	-	-	-	-	-	-	-	-

M680-16 • XPHT

(continued)



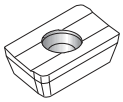


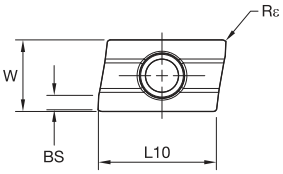
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160412	2	9,53	15,67	4,76	1,50	1,20	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843936	-	-	-
XPHT160412	2	9,53	15,67	4,76	1,50	1,20	0,16	2025362	-	-	-	-	2964169	2964167	2964180	2964165	2029048	2029050	5427396	-	-	5645178	-	2562092
XPHT160416	2	9,53	15,67	4,76	0,80	1,60	0,16	-	-	-	-	-	-	-	-	2964166	-	-	5427391	-	-	5645179	-	-
XPHT160416	2	9,53	15,67	4,76	0,80	1,60	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843997	-	-	-
XPHT160420	2	9,53	15,67	4,76	0,50	2,00	0,16	-	-	-	-	-	-	-	-	-	-	-	5427398	-	-	5645210	-	-
XPHT160420	2	9,53	15,67	4,76	0,50	2,00	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843994	-	-	-
XPHT160425	2	9,53	15,67	4,76	1,20	2,50	0,16	-	-	-	-	-	-	-	-	-	-	-	5427392	-	-	5645211	-	-
XPHT160425	2	9,53	15,67	4,76	1,20	2,50	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843995	-	-	-
XPHT160432	2	9,53	15,67	4,76	1,20	3,17	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843996	-	-	-
XPHT160432	2	9,53	15,67	4,76	1,20	3,17	0,16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5645212	-	-
XPHT160440	2	9,53	15,67	4,76	1,20	4,00	0,16	-	-	-	-	-	-	-	-	-	-	-	5427394	-	-	5645213	-	-
XPHT160440	2	9,53	15,67	4,76	1,20	4,00	–	-	-	-	-	-	-	-	-	-	-	-	-	-	6843992	-	-	-

M680-16 • XPNT



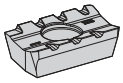


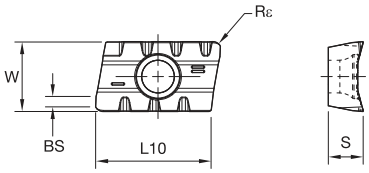
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPNT160412	2	9,53	15,88	4,79	1,20	1,20	0,16	'	'	'	'	'	'	'	2964141	2964174	'	'	5427395	'	6826406	'	'	'
XPNT160412	2	9,53	15,88	4,79	1,20	1,20	0,16	'	'	'	'	'	'	'	'	'	'	2029075	'	'	'	'	'	'

M680-16 • XPHT-MR



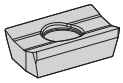


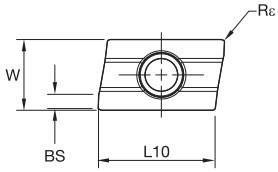
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160412MR	2	9,53	15,77	4,76	1,70	1,20	0,18	'	'	'	'	'	'	'	'	2964142	'	'	5427390	'	'	'	'	'
XPHT160412MR	2	9,53	15,77	4,76	1,70	1,20	—	'	'	'	'	'	'	'	'	'	'	'	'	'	6843939	'	'	'

M680-16 • XPHT-L





● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160412L	2	9,53	–	4,76	1,40	1,20	0,16	'	'	'	'	'	'	'	'	'	'	'	5427397	'	6843993	'	'	'

M680 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	XPHT-GE	WP40PM	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P3–P4	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P5–P6	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
M1–M2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
M3	XPHT-GE	TN7535	**XPHT..**	**WP40PM**	XPHT-MR	TN7535
K1–K2	XPHT-GE	TN6510	**XPHT..**	**TN6520**	XPHT-MR	WK15CM
K3	XPHT-GE	TN6510	**XPHT..**	**TN7535**	XPHT-MR	WK15CM
N1–N2	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
N3	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
S1–S2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S3	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S4	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
H1	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540

M680 • Recommended Starting Speeds [m/min]

Material Group		THR			THM-U			TN6501			TN6502			TN6510			TN6520			TN6525			TN6540		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	265	**210**	180	210	**160**	140
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	235	**180**	155	180	**140**	115
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	195	**140**	120	150	**110**	90
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	260	**195**	165	200	**150**	125
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	170	**135**	110	135	**100**	85
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**100**	65	110	**65**	50
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	**65**	40	65	**40**	35
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	105	**65**	45	70	**40**	35
K	1	150	**135**	120	190	**170**	150	–	–	–	–	–	–	400	**290**	215	375	**265**	190	230	**205**	185	185	**170**	150
	2	185	**140**	120	–	–	–	–	–	–	–	–	–	350	**235**	170	325	**210**	160	180	**160**	150	145	**130**	115
	3	105	**75**	50	–	–	–	–	–	–	–	–	–	280	**215**	165	250	**190**	135	150	**135**	120	130	**120**	105
N	1	900	**600**	500	2000	**1200**	1000	2000	**1200**	1000	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	1365	**815**	665	1365	**815**	665	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	800	**500**	400	800	**500**	400	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–
S	1	35	**25**	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**30**	25
	2	25	**20**	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	**15**	10
	3	50	**40**	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	**35**	25
	4	35	**25**	18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**25**	20
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TTM08			WK15PM			WP35CM			WU20PM			TTI25			THM			WK15CM			WP40PM			WS30PM		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	1	230	**200**	190	–	–	–	455	**395**	370	330	**290**	270	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	2	195	**170**	140	–	–	–	280	**255**	230	275	**250**	200	260	**210**	180	–	–	–	–	–	–	250	**215**	180	–	–	–
	3	180	**150**	125	–	–	–	255	**230**	205	255	**220**	175	260	**210**	180	–	–	–	–	–	–	230	**195**	160	–	–	–
	4	160	**130**	105	–	–	–	190	**175**	160	225	**190**	150	220	**180**	150	–	–	–	–	–	–	205	**170**	135	–	–	–
	5	–	–	–	–	–	–	260	**230**	210	185	**175**	150	265	**195**	165	–	–	–	–	–	–	170	**155**	135	–	–	–
	6	–	–	–	–	–	–	160	**135**	110	165	**130**	100	120	**90**	75	–	–	–	–	–	–	150	**115**	90	–	–	–
M	1	–	–	–	–	–	–	205	**185**	155	205	**180**	165	400	**260**	180	–	–	–	–	–	–	195	**170**	155	225	**200**	185
	2	–	–	–	–	–	–	185	**160**	140	185	**160**	130	270	**170**	120	–	–	–	–	–	–	175	**150**	125	205	**180**	145
	3	–	–	–	–	–	–	145	**130**	115	140	**120**	95	265	**175**	120	–	–	–	–	–	–	130	**115**	90	155	**135**	105
K	1	–	–	–	400	**290**	215	295	**265**	240	250	**220**	185	185	**155**	130	–	–	–	420	**385**	340	–	–	–	–	–	–
	2	–	–	–	350	**235**	170	235	**210**	190	200	**180**	150	150	**120**	105	–	–	–	335	**295**	275	–	–	–	–	–	–
	3	–	–	–	280	**215**	165	195	**175**	160	180	**150**	120	120	**105**	85	–	–	–	280	**250**	230	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	400	**350**	300	–	–	–	560	**485**	420	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	2	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	3	–	–	–	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**45**	30
	4	–	–	–	–	–	–	66	**50**	33	70	**50**	35	–	–	–	–	–	–	–	–	–	65	**50**	35	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	110	**80**	70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

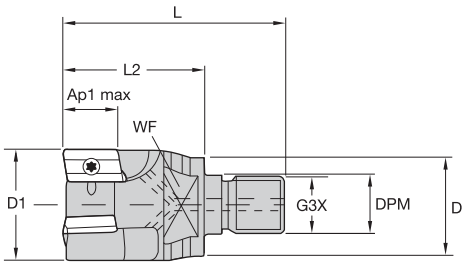
M680 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
XPHT-ALP	0,12	**0,35**	0,58	0,08	**0,25**	0,42	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	XPHT-ALP
XPHT-GE	0,19	**0,47**	0,70	0,14	**0,34**	0,50	0,11	**0,26**	0,38	0,09	**0,22**	0,33	0,08	**0,20**	0,30	XPHT-GE
XPHT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPHT..
XPNT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPNT..
XPHT-MR	0,23	**0,59**	0,92	0,17	**0,43**	0,66	0,13	**0,32**	0,50	0,11	**0,28**	0,43	0,10	**0,25**	0,40	XPHT-MR

NOTE: Use "Light Machining" value as starting feed rate.

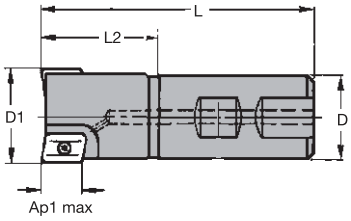
M680+ • Screw-On • Metric



order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
2223036	**12396931400**	25	25	12,5	M12	52	30	19	9,5	3	9500	Yes	0,2
2223037	**12396931600**	32	32	17,0	M16	63	40	22	9,5	5	8500	Yes	0,3

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification. For tool body modification instructions, see page A114.

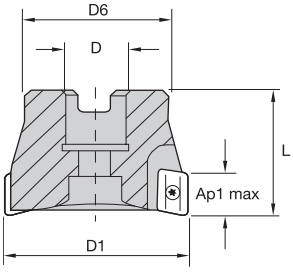
M680+ • Weldon® Shank • Metric



order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2223034	**12396925000**	32	32	100	40	9,5	5	16000	Yes	0,5

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification. For tool body modification instructions, see page A114.

M680+ • Shell Mills • Metric



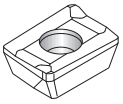
order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2223028	**12396906400**	40	22	38	40	9,5	6	14000	Yes	0,2

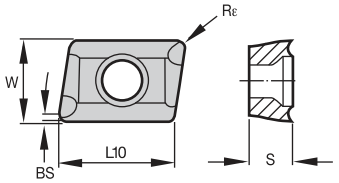
NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification. For tool body modification instructions, see page A114.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M680+ • AONT-ML



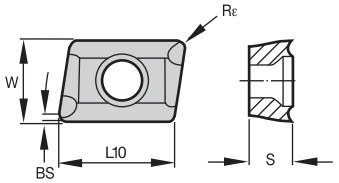


● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
AONT10T308ML	2	7,50	10,37	3,92	1,00	0,80	0,08	2031642	-	-	-	-	2957823	2957762	-	2957760	-	-	-	-	-	-	-	-

M680+ • AONT-MM

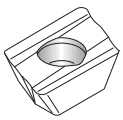


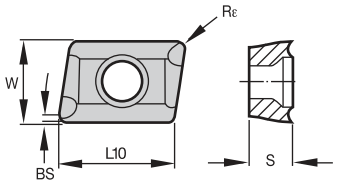
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
AONT10T308MM	2	7,54	10,44	3,97	1,00	0,80	0,10	-	-	-	-	-	-	-	-	-	-	-	6118214	-	-	-	-	-

M680+ • AONT-MH





● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●			●	●	○	●
M								○	●	○				●	●	●	●
K	○	●	○			●	●	○	○	○		●	●	○			○
N	●	○	○	●	●												○
S			○						●					○	○	●	○
H																○	○

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WK15PM	WP35CM	WP40PM	WS30PM	WU20PM
AONT10T308MH	2	7,54	10,44	3,97	1,00	0,80	0,12	-	-	-	-	-	-	-	2957827	2957824	-	-	-	-	6901183	-	-	-
AONT10T308MM	2	7,54	10,44	3,97	1,00	0,80	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	6901185	-	-	-

M680+ • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XPHT-GE	WP40PM	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P3–P4	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P5–P6	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
M1–M2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
M3	XPHT-GE	TN7535	**XPHT..**	**WP40PM**	XPHT-MR	TN7535
K1–K2	XPHT-GE	TN6510	**XPHT..**	**TN6520**	XPHT-MR	WK15CM
K3	XPHT-GE	TN6510	**XPHT..**	**TN7535**	XPHT-MR	WK15CM
N1–N2	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
N3	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
S1–S2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S3	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S4	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
H1	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540

M680+ • Recommended Starting Speeds [m/min]

Material Group		THR			THM-U			TN6501			TN6502			TN6510			TN6520			TN6525			TN6540		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	265	**210**	180	210	**160**	140
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	235	**180**	155	180	**140**	115
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	195	**140**	120	150	**110**	90
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	260	**195**	165	200	**150**	125
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	170	**135**	110	135	**100**	85
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**100**	65	110	**65**	50
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	**65**	40	65	**40**	35
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	105	**65**	45	70	**40**	35
K	1	150	**135**	120	190	**170**	150	–	–	–	–	–	–	400	**290**	215	375	**265**	190	230	**205**	185	185	**170**	150
	2	185	**140**	120	–	–	–	–	–	–	–	–	–	350	**235**	170	325	**210**	160	180	**160**	150	145	**130**	115
	3	105	**75**	50	–	–	–	–	–	–	–	–	–	280	**215**	165	250	**190**	135	150	**135**	120	130	**120**	105
N	1	900	**600**	500	2000	**1200**	1000	2000	**1200**	1000	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	1365	**815**	665	1365	**815**	665	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	800	**500**	400	800	**500**	400	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–
S	1	35	**25**	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**30**	25
	2	25	**20**	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	**15**	10
	3	50	**40**	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	**35**	25
	4	35	**25**	18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**25**	20
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

M680+ • Recommended Starting Speeds [m/min]

Material Group		TTM08			WK15PM			WP35CM			WU20PM			TTI25			THM			WK15CM			WP40PM			WS30PM		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	1	230	**200**	190	–	–	–	455	**395**	370	330	**290**	270	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	2	195	**170**	140	–	–	–	280	**255**	230	275	**250**	200	260	**210**	180	–	–	–	–	–	–	250	**215**	180	–	–	–
	3	180	**150**	125	–	–	–	255	**230**	205	255	**220**	175	260	**210**	180	–	–	–	–	–	–	230	**195**	160	–	–	–
	4	160	**130**	105	–	–	–	190	**175**	160	225	**190**	150	220	**180**	150	–	–	–	–	–	–	205	**170**	135	–	–	–
	5	–	–	–	–	–	–	260	**230**	210	185	**175**	150	265	**195**	165	–	–	–	–	–	–	170	**155**	135	–	–	–
	6	–	–	–	–	–	–	160	**135**	110	165	**130**	100	120	**90**	75	–	–	–	–	–	–	150	**115**	90	–	–	–
M	1	–	–	–	–	–	–	205	**185**	155	205	**180**	165	400	**260**	180	–	–	–	–	–	–	195	**170**	155	225	**200**	185
	2	–	–	–	–	–	–	185	**160**	140	185	**160**	130	270	**170**	120	–	–	–	–	–	–	175	**150**	125	205	**180**	145
	3	–	–	–	–	–	–	145	**130**	115	140	**120**	95	265	**175**	120	–	–	–	–	–	–	130	**115**	90	155	**135**	105
K	1	–	–	–	400	**290**	215	295	**265**	240	250	**220**	185	185	**155**	130	–	–	–	420	**385**	340	–	–	–	–	–	–
	2	–	–	–	350	**235**	170	235	**210**	190	200	**180**	150	150	**120**	105	–	–	–	335	**295**	275	–	–	–	–	–	–
	3	–	–	–	280	**215**	165	195	**175**	160	180	**150**	120	120	**105**	85	–	–	–	280	**250**	230	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	400	**350**	300	–	–	–	560	**485**	420	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	2	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	3	–	–	–	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**45**	30
	4	–	–	–	–	–	–	66	**50**	33	70	**50**	35	–	–	–	–	–	–	–	–	–	65	**50**	35	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	110	**80**	70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M680+ • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
XPHT-ALP	0,12	**0,35**	0,58	0,08	**0,25**	0,42	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	XPHT-ALP
XPHT-GE	0,19	**0,47**	0,70	0,14	**0,34**	0,50	0,11	**0,26**	0,38	0,09	**0,22**	0,33	0,08	**0,20**	0,30	XPHT-GE
XPHT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPHT..
XPNT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPNT..
XPHT-MR	0,23	**0,59**	0,92	0,17	**0,43**	0,66	0,13	**0,32**	0,50	0,11	**0,28**	0,43	0,10	**0,25**	0,40	XPHT-MR

NOTE: Use "Light Machining" value as starting feed rate.

M690 Series

M690 IC12, M690 IC15 Shoulder Mills

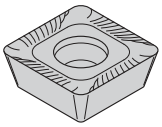
The M690 shoulder mill is an economical, four-edged tool designed to deliver optimal chip evacuation, excellent shoulder finish, and free cutting action.

iC12 AND iC15 INSERTS OFFERED IN FOUR GEOMETRIES

-ALP

N

Recommended as a first choice for machining non-ferrous and aluminum materials.



-ML

P M K

Steel, cast iron with secondary uses on stainless and titanium.

-MM

P M K

Steel, cast iron with secondary uses on stainless and titanium.

Recommended as a first choice for general machining of all materials.

-MH

P M K

This geometry is reserved for heavy or interrupted cut machining operations that require additional edge protection.

ECONOMICAL SHOULDER MILLING

PRODUCT

SERIES

M690

DIAMETER RANGE

125–315mm

SHANK TYPES

Shell Mills
Weldon® End Mills

INDUSTRY

GENERAL ENGINEERING

ENERGY

TRANSPORTATION

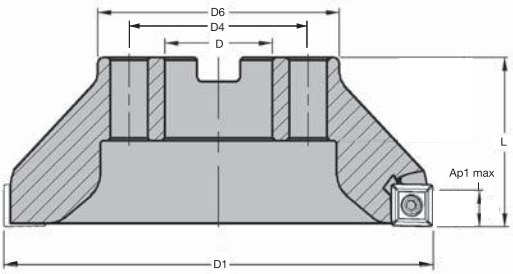
APPLICATIONS

SIDE MILLING/ SHOULDER MILLING: SQUARE END

FACE MILLING

SLOTTING: SQUARE END

M690 • Shell Mills SD1204.. • Metric



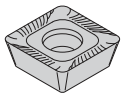
order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003556	**12396953800**	50	22	—	47	40	10,0	4	22400	Yes	0,3
2003557	**12396954000**	50	22	—	47	40	10,0	5	22400	Yes	0,3
2003573	**12396954200**	63	22	—	50	40	10,0	5	20000	Yes	0,5
2003574	**12396954400**	63	22	—	50	40	10,0	6	20000	Yes	0,5
2003580	**12396954600**	80	27	—	60	50	10,0	6	17700	Yes	1,0
2003581	**12396954800**	80	27	—	60	50	10,0	8	17700	Yes	1,1
2003596	**12396955000**	100	32	—	78	50	10,0	8	15800	No	1,5
2003597	**12396955200**	100	32	—	78	50	10,0	10	15800	No	1,6
2003693	**12396955400**	125	40	—	89	63	10,0	9	14200	No	3,0
2003694	**12396955600**	125	40	—	89	63	10,0	12	14200	No	3,0
2003793	**12396955800**	160	40	66,7	90	63	10,0	12	12500	No	3,6

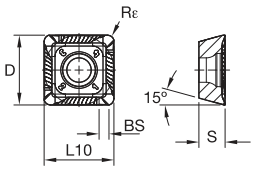
NOTE: Standard milling cutters will accept insert nose radius up to 2mm without modification.
For tool body modification instructions, see page A114.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M690 • SDMT-ML • SD1204..



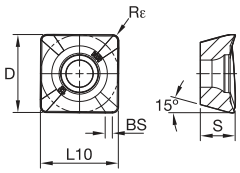


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P			●	●		●	○	●
M			○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMT1204PDRML	4	13	12,70	4,77	1,10	1,20	0,08	-	3094667	-	3020185	5427423	-	-	6180319

M690 • SDMX-MM • SD1204..

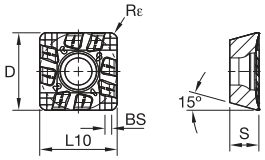


● first choice
○ alternate choice

P			●	●		●	○	●
M			○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMX120408RMM	4	13	12,70	4,76	1,93	0,80	0,10	-	-	3950588	3950589	-	6842067	5522490	6180317
SDMX120412RMM	4	13	12,70	4,76	1,50	1,20	0,10	-	-	-	3950597	-	6842095	5519572	6180318
SDMX120416RMM	4	13	12,70	4,76	1,50	1,60	0,10	-	4145063	-	4145065	-	-	-	-
SDMX120424RMM	4	13	12,70	4,76	0,60	2,40	0,10	-	-	-	4145072	-	6842091	-	-
SDMX120432RMM	4	13	12,70	4,76	—	3,20	0,10	-	-	-	4145094	-	6842092	-	-

M690 • SDMX-MH • SD1204..

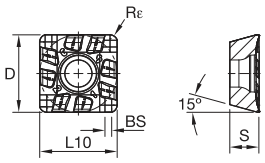


● first choice
○ alternate choice

P				●	●		●	○	●
M				○	●		●	●	●
K		●	●	○	○	●	○		
N		○							○
S					●		○	●	●
H								○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMX120408RMH	4	13	12,70	4,76	1,93	0,80	0,14	-	-	-	3950592	5427427	6842069	-	-
SDMX120412RMH	4	13	12,70	4,76	1,54	1,20	0,14	-	3950614	3950601	3950603	5427428	6842093	-	-
SDMX120416RMH	4	13	12,70	4,76	1,50	1,60	0,14	-	-	-	3950607	-	6842070	-	-

M690 • SDMT-MH • SD1204..

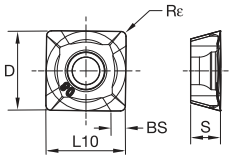


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P			●	●		●	○	●
M			○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMT1204PDRMH	4	13	12,70	4,81	1,10	1,20	0,14	'	'	3325040	3326330	5427422	'	'	'

M690 • SDEX-ALP • SD1204..



● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P			●	●		●	○	●
M			○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDEX120408FRALP	4	.500	.504	.187	.060	.031	.001	5281790	'	'	'	'	'	'	'

M690 SD1204 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P3–P4	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	WS40PM	**.S..MM**	**WS40PM**	.S..MH	WP35CM
K1–K2	.E..ML	WK15CM	**.E..ML**	**WK15CM**	.S..MH	WK15CM
K3	.E..ML	WK15CM	**.S..MM**	**TN6525**	.S..MH	TN6525
N1–N2	.ALP	THM-U	**.E..ML**	**THM-U**	.S..ML	THM-U
N3	.ALP	THM-U	**.E..ML**	**THM-U**	.S..ML	THM-U
S1–S2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540
S3	.E..ML	TN6540	**.S..MM**	**WS30PM**	.S..MM	TN6540
S4	.E..ML	TN6540	**.S..MM**	**WS30PM**	.S..MM	TN6540
H1	.S..MM	WS30PM	**.S..MM**	**WS30PM**	.S..MM	WS30PM

M690 SD1204 • Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			WP35CM		
P	0	–	–	–	340	**265**	235	300	**235**	200	–	–	–
	1	–	–	–	340	**265**	235	300	**235**	200	455	**395**	370
	2	–	–	–	265	**210**	180	210	**160**	140	280	**255**	230
	3	–	–	–	235	**180**	155	180	**140**	115	255	**230**	205
	4	–	–	–	195	**140**	120	150	**110**	90	190	**175**	160
	5	–	–	–	260	**195**	165	200	**150**	125	260	**230**	210
	6	–	–	–	170	**135**	110	135	**100**	85	160	**135**	110
M	1	–	–	–	160	**100**	65	110	**65**	50	205	**185**	155
	2	–	–	–	100	**65**	40	65	**40**	35	185	**160**	140
	3	–	–	–	105	**65**	45	70	**40**	35	145	**130**	115
K	1	375	**265**	190	230	**205**	185	185	**170**	150	295	**265**	240
	2	325	**210**	160	180	**160**	150	145	**130**	115	235	**210**	190
	3	250	**190**	135	150	**135**	120	130	**120**	105	195	**175**	160
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	40	**30**	25	–	–	–
	2	–	–	–	–	–	–	20	**15**	10	–	–	–
	3	–	–	–	–	–	–	60	**35**	25	–	–	–
	4	–	–	–	–	–	–	50	**25**	20	66	**50**	33
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WK15CM			WS30PM			WS40PM			THM-U		
P	0	–	–	–	–	–	–	–	–	–	–	–	–
	1	–	–	–	–	–	–	280	**245**	230	–	–	–
	2	–	–	–	–	–	–	235	**205**	170	–	–	–
	3	–	–	–	–	–	–	215	**185**	150	–	–	–
	4	–	–	–	–	–	–	195	**160**	130	–	–	–
	5	–	–	–	–	–	–	160	**140**	130	–	–	–
	6	–	–	–	–	–	–	140	**110**	85	–	–	–
M	1	–	–	–	225	**200**	185	260	**190**	115	–	–	–
	2	–	–	–	205	**180**	145	230	**170**	105	–	–	–
	3	–	–	–	155	**135**	105	190	**140**	80	–	–	–
K	1	420	**385**	340	–	–	–	–	–	–	190	**170**	150
	2	335	**295**	275	–	–	–	–	–	–	–	–	–
	3	280	**250**	230	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	1075	**945**	945	2000	**1200**	1000
	2	–	–	–	–	–	–	945	**875**	845	1365	**815**	665
	3	–	–	–	–	–	–	875	**760**	760	800	**500**	400
S	1	–	–	–	45	**40**	30	62	**45**	27	–	–	–
	2	–	–	–	45	**40**	30	55	**40**	26	–	–	–
	3	–	–	–	55	**45**	30	64	**46**	29	–	–	–
	4	–	–	–	85	**60**	40	90	**66**	42	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

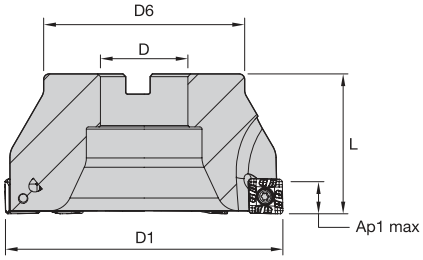
M690 SD1204 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..ALP	0,12	0,23	0,46	0,08	0,17	0,33	0,06	0,13	0,25	0,06	0,11	0,22	0,05	0,10	0,20	.F..ALP
.E..ML	0,12	0,35	0,58	0,08	0,25	0,42	0,06	0,19	0,31	0,06	0,17	0,27	0,05	0,15	0,25	.E..ML
.S..MM	0,12	0,42	0,70	0,08	0,30	0,50	0,06	0,23	0,38	0,06	0,20	0,33	0,05	0,18	0,30	.S..MM
.S..MH	0,23	0,54	0,85	0,17	0,39	0,61	0,13	0,29	0,46	0,11	0,25	0,40	0,10	0,23	0,36	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.

M690 • Shell Mills SD1506.. • Metric

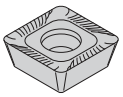


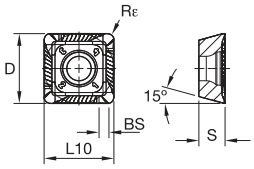
order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003555	**12396943800**	50	22	47	40	12,0	4	18500	Yes	0,3
2003562	**12396944200**	63	22	50	40	12,0	5	16100	Yes	0,4
2003579	**12396944600**	80	27	60	50	12,0	6	14000	Yes	0,9
2003595	**12396945000**	100	32	78	50	12,0	8	12300	No	1,3
2003682	**12396945400**	125	40	89	63	12,0	9	10800	No	2,7

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M690 • SDMT-ML • SD1506..



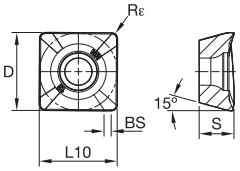


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P			●	●		●	○	●
M			○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMT1506PDRML	4	.625	.625	.249	.043	.047	.003	ı	ı	ı	3378677	5427425	ı	ı	ı

M690 • SDMX-MM • SD1506..

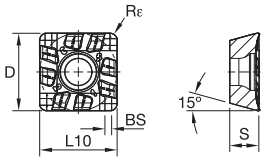


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P			●	●		●	○	●
M			○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMX150612RMM	4	.625	.625	.250	.057	.047	.006	ı	ı	ı	3949807	ı	ı	ı	ı

M690 • SDMX-MM • SD1506..

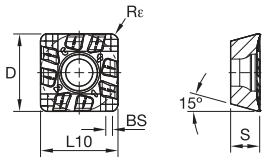


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P				●	●		●	○	●
M				○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMX150612RMH	4	.625	.625	.250	.057	.047	.008	-	-	-	3949811	5427426	6901182	-	-
SDMX150616RMH	4	.625	.625	.250	.059	.063	.008	-	-	-	-	6052028	-	-	-

M690 • SDMT-MH • SD1506..



● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
P				●	●		●	○	●
M				○	●		●	●	●
K	●	●	○	○	●	○		
N	○							○
S				●		○	●	●
H							○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMT1506PDRMH	4	.625	.625	.250	.043	.047	.003	-	-	-	3378676	5427424	6907181	-	-

M690 SD1506 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P3–P4	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	TN6540	**.S..MM**	**WP35CM**	.S..MH	WP35CM
K1–K2	.E..ML	WK15CM	**.E..ML**	**WK15CM**	.S..MH	WK15CM
K3	.E..ML	WK15CM	**.S..MM**	**WK15CM**	.S..MH	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540
S3	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540
S4	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540
H1	.S..MM	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540

M690 SD1506 • Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			WP35CM		
P	0	–	–	–	340	**265**	235	300	**235**	200	–	–	–
	1	–	–	–	340	**265**	235	300	**235**	200	455	**395**	370
	2	–	–	–	265	**210**	180	210	**160**	140	280	**255**	230
	3	–	–	–	235	**180**	155	180	**140**	115	255	**230**	205
	4	–	–	–	195	**140**	120	150	**110**	90	190	**175**	160
	5	–	–	–	260	**195**	165	200	**150**	125	260	**230**	210
	6	–	–	–	170	**135**	110	135	**100**	85	160	**135**	110
M	1	–	–	–	160	**100**	65	110	**65**	50	205	**185**	155
	2	–	–	–	100	**65**	40	65	**40**	35	185	**160**	140
	3	–	–	–	105	**65**	45	70	**40**	35	145	**130**	115
K	1	375	**265**	190	230	**205**	185	185	**170**	150	295	**265**	240
	2	325	**210**	160	180	**160**	150	145	**130**	115	235	**210**	190
	3	250	**190**	135	150	**135**	120	130	**120**	105	195	**175**	160
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	40	**30**	25	–	–	–
	2	–	–	–	–	–	–	20	**15**	10	–	–	–
	3	–	–	–	–	–	–	60	**35**	25	–	–	–
	4	–	–	–	–	–	–	50	**25**	20	66	**50**	33
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WK15CM			WS30PM			WS40PM			THM-U		
P	0	–	–	–	–	–	–	–	–	–	–	–	–
	1	–	–	–	–	–	–	280	**245**	230	–	–	–
	2	–	–	–	–	–	–	235	**205**	170	–	–	–
	3	–	–	–	–	–	–	215	**185**	150	–	–	–
	4	–	–	–	–	–	–	195	**160**	130	–	–	–
	5	–	–	–	–	–	–	160	**140**	130	–	–	–
	6	–	–	–	–	–	–	140	**110**	85	–	–	–
M	1	–	–	–	225	**200**	185	260	**190**	115	–	–	–
	2	–	–	–	205	**180**	145	230	**170**	105	–	–	–
	3	–	–	–	155	**135**	105	190	**140**	80	–	–	–
K	1	420	**385**	340	–	–	–	–	–	–	190	**170**	150
	2	335	**295**	275	–	–	–	–	–	–	–	–	–
	3	280	**250**	230	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	1075	**945**	945	2000	**1200**	1000
	2	–	–	–	–	–	–	945	**875**	845	1365	**815**	665
	3	–	–	–	–	–	–	875	**760**	760	800	**500**	400
S	1	–	–	–	45	**40**	30	62	**45**	27	–	–	–
	2	–	–	–	45	**40**	30	55	**40**	26	–	–	–
	3	–	–	–	55	**45**	30	64	**46**	29	–	–	–
	4	–	–	–	85	**60**	40	90	**66**	42	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

NOTE: FIRST choice starting speeds are in bold type.
As the average chip thickness increases, the speed should be decreased.

M690 SD1506 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..ALP	0,12	**0,23**	0,46	0,08	**0,17**	0,33	0,06	**0,13**	0,25	0,06	**0,11**	0,22	0,05	**0,10**	0,20	.F..ALP
.E..ML	0,12	**0,35**	0,58	0,08	**0,25**	0,42	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	.E..ML
.S..MM	0,12	**0,42**	0,70	0,08	**0,30**	0,50	0,06	**0,23**	0,38	0,06	**0,20**	0,33	0,05	**0,18**	0,30	.S..MM
.S..MH	0,23	**0,54**	0,85	0,17	**0,39**	0,61	0,13	**0,29**	0,46	0,11	**0,25**	0,40	0,10	**0,23**	0,36	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.

VHSC

VHSC Shoulder Mill

The VHSC Victory™ high-speed cutter is designed to perform true high-speed profiling and pocket milling operations on thin-walled aluminum alloy components using heavy feeds and high ramping angles.

Flute engineered for maximum chip evacuation.

Cylindrical shank designed and balanced to G6.3 at 30,000RPM.

Internal coolant to enable chip evacuation.

Inserts with different radii are held without losing gauge height of the cutter length.

The VHSC high-speed cutter's proprietary pocket design allows multiple insert radii (R0.4–R6.0) for one body definition while also maintaining axial positioning regardless of the size of the insert corner nose radius. This feature saves time for CNC programmers and operators by removing the step to re-balance and modify the body during the insert change process.

Seven different corner nose radii are available, each with 16mm axial cutting depth.

HIGH-SPEED CUTTING INSERTS XDET-ALP FOR NON-FERROUS MATERIALS

FR-ALP

N

Sharp cutting edge "F" preparation for roughing and finishing jobs.

ER-ALP

N

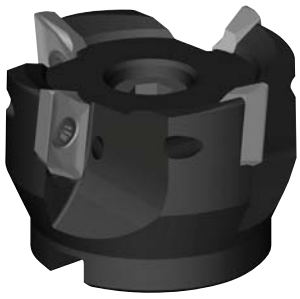
Honed cutting edge "E" preparation for heavy roughing jobs and demanding castings.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

TRUE HSC

Developed to achieve true HSC cutting of aluminum components up to 9843 SFM or 3,000m/min.



THIN-WALLED ALUMINUM HIGH-SPEED CUTTING

PRODUCT

SERIES

VHSC

DIAMETER RANGE

Cylindrical End Mills: 25–32mm
Monoblocks: 25–50mm
Shell Mills: 40–80mm

SHANK TYPES

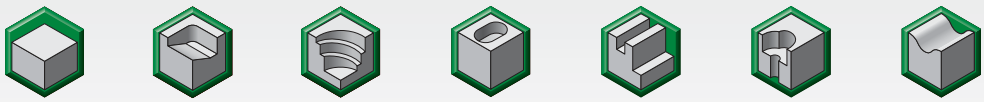
Cylindrical End Mills
Monoblocks
Shell Mills

INDUSTRY

AEROSPACE

GENERAL ENGINEERING

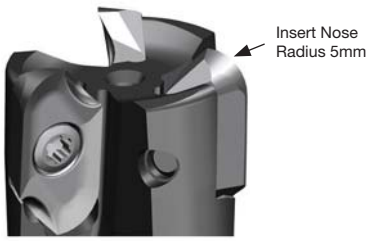
APPLICATIONS



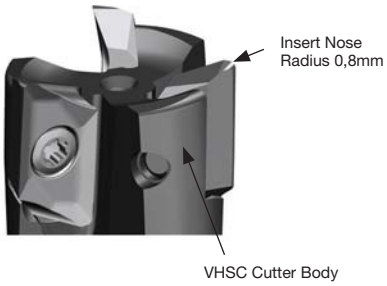
FACE MILLING | RAMPING BLANK | HELICAL MILLING | POCKETING | SIDE/ SHOULDER MILLING: SLOTTING: SHOULDER | SPIRAL/ CIRCULAR | 3D PROFILING

USER-FRIENDLY SETUP MAKES A BIG DIFFERENCE

LARGE CORNER RADIUS

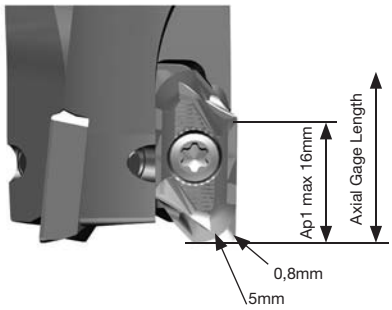


SMALL CORNER RADIUS



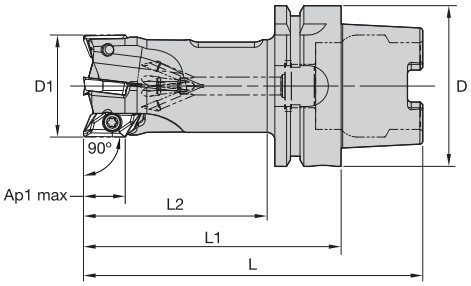
- Unique feature has a great impact on significant cost savings.
- Only one cutter body needed to load inserts with corner nose radii from R0,4mm to R6mm max.
- All other suppliers require modification and rebalance of the cutter body.

INSERT OVERLAY



- Axial gage length on the cutter body will always be the same, no matter which insert nose radius is applied.
- Preferred by CNC programmers and operators.
- Ap1 max will always remain 16mm, no matter which insert nose radius is applied.

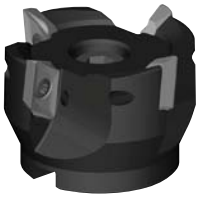
VHSC • Monoblocks • Metric

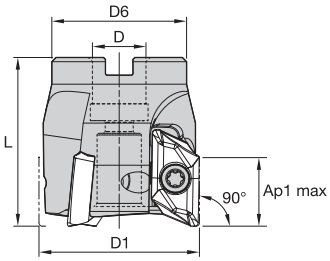


order number	catalogue number	D1	D	L	L1	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425447	VHSC025Z02HSK63XD16	25	63	133	101	75	16	2	14.5°	51000	Yes	0,81
6425449	VHSC032Z03HSK63XD16	32	63	133	101	75	16	3	11.4°	41500	Yes	0,91
6425451	VHSC040Z04HSK63XD16	40	63	133	101	75	16	4	7.8°	35000	Yes	1,09
6425453	VHSC050Z04HSK63XD16	50	63	133	101	75	15	4	7.9°	30000	Yes	1,41

NOTE: Pre-Balanced G6.3/30000 RPM.
NOTE: It is important to change the screw each time the insert is changed to ensure the highest security. A dynamometric key and the correct insert screw torque value are key for HSC applications. Adjustable torque wrench (order number 6197561) and Torx Plus 20 bit (order number 6205891) may be purchased seperately.

VHSC • Shell Mills • Metric

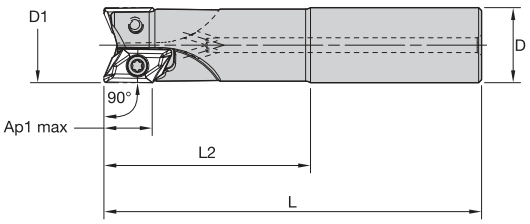




order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425291	VHSC040Z03S16XD16	40	16	32	45	16	3	7.6°	35000	Yes	0,20
6425292	VHSC050Z04S22XD16	50	22	45	45	16	4	7.8°	30000	Yes	0,31
6425293	VHSC063Z04S22XD16	63	22	50	45	16	4	5.9°	26000	Yes	0,55
6425294	VHSC080Z05S27XD16	80	27	55	50	16	5	4.4°	22500	Yes	0,89

NOTE: It is important to change the screw each time the insert is changed to ensure the highest security. A dynamometric key and the correct insert screw torque value are key for HSC applications. Adjustable torque wrench (order number 6197561) and Torx Plus 20 bit (order number 6205891) may be purchased seperately.

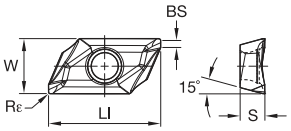
VHSC • Cylindrical End Mills • Metric

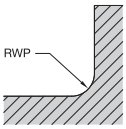


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425258	VHSC025Z02A25XD16	25	25	131	75	16	2	14.7°	50000	Yes	0,39
6425259	VHSC032Z02A32XD16	32	32	135	75	16	2	11.4°	41500	Yes	0,65
6425260	VHSC032Z03A32XD16	32	32	135	75	16	3	11.4°	41500	Yes	0,65

NOTE: Pre-balanced to G6.3/30000 RPM.
NOTE: It is important to change the screw each time the insert is changed to ensure the highest security. A dynamometric key and the correct insert screw torque value are key for HSC applications. Adjustable torque wrench (order number 6197561) and Torx Plus 20 bit (order number 6205891) may be purchased seperately.

VHSC • XDET-ALP





● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	RWP*	hm	WN10HM
XDET16M5PDFRALP	2	22,92	5,00	11,25	1,42	0,30	0,30	0,02	6425772
XDET16M504FRALP	2	23,02	5,00	11,25	1,27	0,40	0,40	0,02	6425773
XDET16M508FRALP	2	23,02	5,00	11,25	0,87	0,80	0,80	0,02	6425774
XDET16M512FRALP	2	23,02	5,00	11,25	0,87	1,24	1,20	–	6797599
XDET16M516FRALP	2	23,02	5,00	11,25	0,87	1,68	1,60	–	6797600
XDET16M520FRALP	2	23,02	5,00	11,25	0,58	2,10	2,00	0,02	6425775
XDET16M530ERALP	2	23,02	5,00	11,25	0,48	3,10	3,00	0,03	6425776
XDET16M530FRALP	2	23,02	5,00	11,25	0,48	3,10	3,00	0,02	6425777
XDET16M540ERALP	2	23,02	5,00	11,25	0,60	4,10	4,00	0,03	6425778
XDET16M540FRALP	2	23,02	5,00	11,25	0,60	4,10	4,00	0,02	6425779
XDET16M550FRALP	2	23,02	5,00	11,25	0,24	5,20	5,00	0,02	6425780

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VHSC • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
N1–N2	.F..ALP	WN10HM	**.F..ALP**	**WN10HM**	.E..ALP	WN10HM
N3	.F..ALP	WN10HM	**.F..ALP**	**WN10HM**	.E..ALP	WN10HM

VHSC • Recommended Starting Speeds [m/min]

Material Group		WN10HM		
N	1	2950	**1800**	875
	2	2950	**1800**	875
	3	1600	**850**	480

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

VHSC • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..ALP	0,12	**0,45**	0,81	0,08	**0,33**	0,58	0,06	**0,25**	0,43	0,06	**0,21**	0,38	0,05	**0,20**	0,35	.F..ALP
.E..ALP	0,15	**0,50**	0,92	0,11	**0,36**	0,66	0,08	**0,27**	0,50	0,07	**0,24**	0,43	0,07	**0,22**	0,40	.E..ALP

NOTE: Use "Light Machining" values as starting feed rate.

Recommendations for High Speed Machining at 8000 RPM or above

- Check spindle condition:
  - Runout
  - Clamping of the attachment in traction
  - Marking and cleanliness
- Check that the tool is suitable for the required use.
- Inserts must be locked positively in the pocket and secured using the torx screw provided. The screw must be torqued to the correct value as indicated in the charts on the product pages.
- Because of heavy force to the screw, it is important to change the screw when changing the insert.
- Check the balancing of the assembled tool: cutter body, inserts, and attachment.
- Before start up, note the maximum RPM engraved on the tool. The maximum RPM is linked to a precise balancing value.
- Ensure that the field of application of the tool shown in our technical documents and technological parameters is observed:

Ae (mm)	Width of cut, lateral engagement (radial)
ap (mm)	Axial depth of cut
fz (mm/tooth)	mm per tooth
n (RPM)	Revolutions per minute

WIDIA™ cannot accept responsibility for misuse of this product due to:

- Non-observance of the above instructions
- Machine without casing
- Incorrect clamping of workpieces
- No safety device on the machine
- Any misuse or incorrect clamping

The optimum rotation must be determined by condition of the spindle. The spindle must be rigid to run at these higher RPMs.

Under no circumstances must any attempt be made to repair this tool. The only permitted maintenance is the indexing or replacement of the inserts.

When assembling the cutter to a Shrink Fit holder, the maximum protrusion cannot exceed 10% of the reach of tool.

Balancing:

- Cylindrical shank and HSK63A integral shanks are designed and balanced to G6.3 at 30000 RPM for diameters up to 50mm.
- Cylindrical shank tools mounted in a Shrink Fit holder or any other chuck mill holder + inserts + screws must be re-inspected for balance as an assembly by the end-user when at or exceeding 8000 RPM. End-user must balance the assembly at a G6.3 at 30000 RPM maximum.
- Shell mills are not balanced. These tools must be re-inspected for balance as an assembly, cutter + inserts + screws by the end-user for high speed machining at 8000 RPM or above. End-user must balance the assembly at a G6.3 value minimum.
- Balancing requires removing some material by drilling or milling operations.
- For each new shell mill installed on the same toolholder, re-balance the assembly.

Tighten the bolt between the shell mill and toolholder; with lubricant, apply the torque value of:

Thread sizes (mm)	Cutter Bore Size (mm)	Torque Values Nm
M6	13	10
M8	16	30
M10	22	50
M12	27	80
M16	32	110
M20	40	120

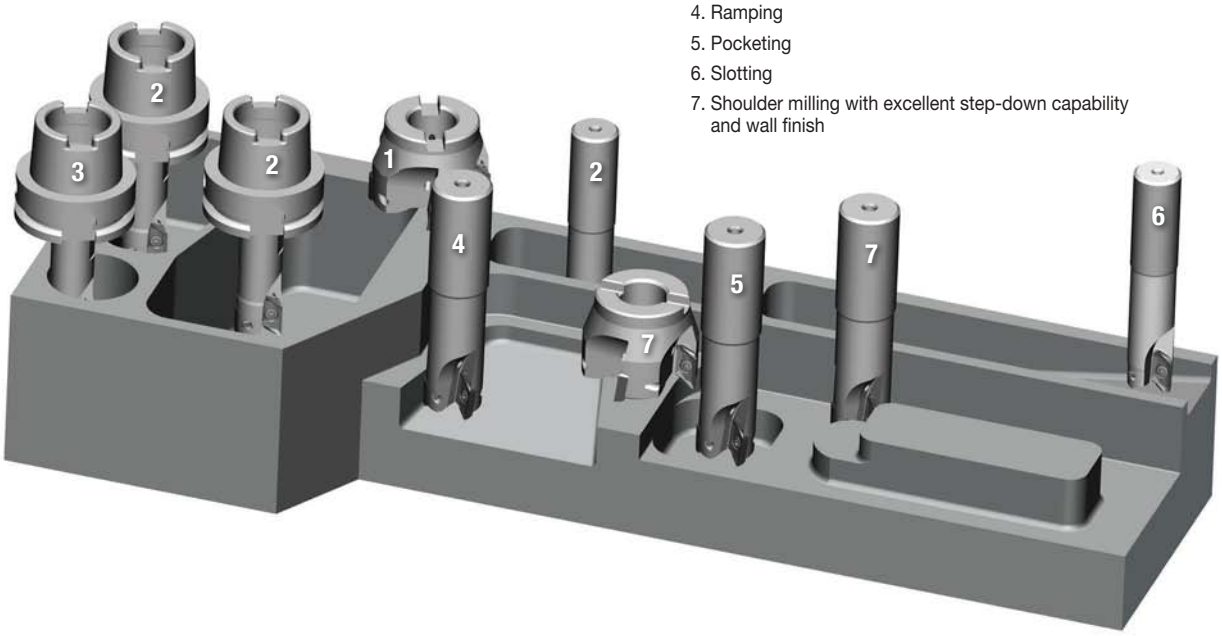
Technical Information

▼ Machinability by Materials • Aluminum

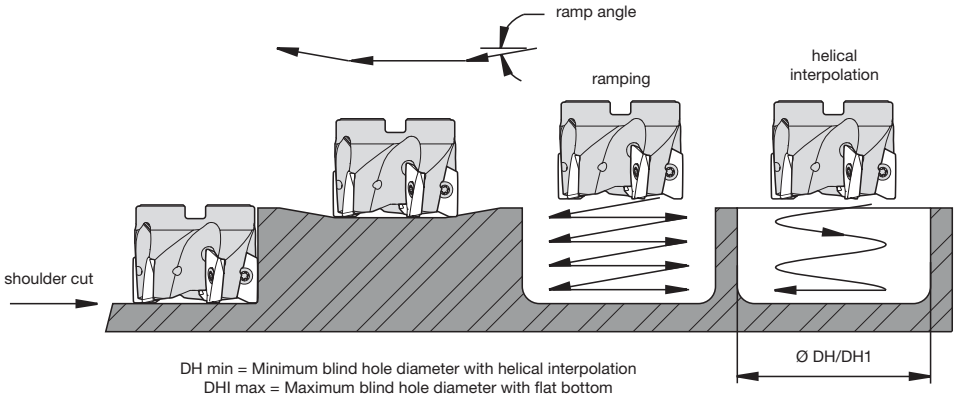
Alloy Group	Alloy Designation	Chemical Composition Limits (WT%)												Typical Temper	Rm (Mpa)	Machinability Chip Formation	Machinability
		Cu	Si	Fe	Mn	Mg	Zn	Cr	Ti	Pb	Bi	Al	Others				
Al	1050	0.05	0.25	0.40	0.50	0.05	0.05	–	–	–	–	99.50min	–	H14	105	D	A
	1100	0.05–0.20	Si+Fe 1.00 max	–	0.05	–	0.10	–	–	–	–	99.00min	–	H14	90	D	A
AlCu	2011	5.00–6.00	0.40	0.70	–	–	0.30	–	–	0.20	0.60	remaining	–	T3	310	A	A
	2014	3.90–5.00	0.50–1.20	0.70	0.40–1.20	0.20–0.80	0.25	0.10	0.15	–	–	remaining	–	T6	430	B	A
	2017	3.50–4.50	0.20–0.80	0.70	0.40–1.00	0.40–0.80	0.25	0.10	0.15	–	–	remaining	–	T4	390	B	A
	2024	3.80–4.90	0.50	0.50	0.30–0.90	1.20–1.80	0.25	0.10	0.15	–	–	remaining	–	T4	465	B	A
	2218	3.50–4.50	0.90	1	0.20	1.20–1.80	0.25	0.10	–	–	–	remaining	Ni1.7–2.3	T72	331	B	B
	2224	3.80–4.40	0.12	0.15	0.30–0.90	1.20–1.80	0.25	0.10	0.15	–	–	remaining	–	–	–	A	A
AlMn	3003	0.05–0.20	0.60	0.70	1.00–1.50	–	0.10	–	–	–	–	remaining	–	H14	140	D	B
AlSi	4032	0.50–1.30	11.00–13.50	1	–	0.80–1.30	0.25	0.10	–	–	–	remaining	Ni0.5–1.3	T6	379	B	D
AlMg	5083	0.10	0.40	0.40	0.40–1.00	4.00–4.90	0.25	0.05–0.25	0.15	–	–	remaining	–	H112	335	C	A
AlMgSi	6061	0.15–0.40	0.40–0.80	0.70	0.15	0.80–1.20	0.25	0.04–0.35	0.15	–	–	remaining	–	T6	300	C	B
	6063	0.10	0.20–0.60	0.35	0.10	0.45–0.90	0.10	0.10	0.10	–	–	remaining	–	T5	200	C	B
	6070	0.15–0.40	1.00–1.70	0.50	0.40–1.00	0.50–1.20	0.25	0.10	0.15	–	–	remaining	–	T6	379	C	C
	6151	0.35	0.60–1.20	1	0.20	0.45–0.80	0.25	0.15–0.35	0.15	–	–	remaining	–	T6	–	C	C
	6262	0.15–0.40	0.40–0.80	0.70	0.15	0.80–1.20	0.25	0.04–0.14	0.15	0.40	0.70	remaining	–	T9	400	B	B
	6351	0.10	0.70–1.30	0.50	0.40–0.80	0.40–0.80	0.20	–	0.20	–	–	remaining	–	T6	310	D	C
	6463	0.20	0.20–0.60	0.15	0.05	0.45–0.90	0.05	–	–	–	–	remaining	–	T6	241	C	B
AlZn	7001	1.60–2.60	0.35	0.40	0.20	2.60–3.40	6.80–8.00	0.18–0.35	0.20	–	–	remaining	–	O	–	B	A
	7003	0.20	0.30	0.35	0.30	0.50–1.00	5.00–6.50	0.20	0.20	–	–	remaining	Zr0.05–0.25	T5	400	B	A
	7050	2.00–2.60	0.12	0.15	0.10	1.90–2.60	5.70–6.70	0.04	0.06	–	–	remaining	Zr0.08–0.15	T73	530	B	A
	7075	1.20–2.00	0.40	0.50	0.30	2.10–2.90	5.10–6.10	0.18–0.28	0.20	–	–	remaining	–	T6	570	B	A
	7178	1.60–2.40	0.40	0.50	0.30	2.40–3.10	6.30–7.30	0.18–0.35	0.20	–	–	remaining	–	T6	600	B	A
	7475	1.20–1.90	0.10	0.12	0.06	1.90–2.60	5.20–6.20	0.18–0.25	0.06	–	–	remaining	–	T61	565	B	A

Machinability: A (Excellent), B (Good to Excellent), C (Good), D (Not Good)

1. Face milling
2. First choice for deep pocketing and thin wall machining
3. Boring by circular interpolation into full material
4. Ramping
5. Pocketing
6. Slotting
7. Shoulder milling with excellent step-down capability and wall finish



Best Practices



▼ Ramp Angle

cutter diameter	Max. Ramping Angle Related to Insert Corner Nose Radius and Cutter D1						
	Facet	R0.4	R0.8	R2.0	R3.0	R4.0	R5.0
25	14,8°	14,8°	14,8°	9,4°	18,8°	9,0°	11,2°
32	11,4°	11,4°	11,4°	11,9°	12,4°	13,1°	13,8°
40	7,6°	7,6°	7,6°	7,8°	8,1°	8,5°	8,8°
50	7,8°	7,5°	7,8°	7,7°	7,9°	8,4°	8,8°
63	5,8°	5,6°	5,9°	5,7°	5,8°	6,1°	6,3°
80	4,4°	4,2°	4,4°	4,2°	4,3°	4,5°	4,7°

▼ Helical Min. Hole and Helical Max. Hole

cutter diameter	DH min	DH1 max
25	30,3	48,8
32	43,5	62,0
40	59,5	78,0
50	79,5	98,0
63	105,5	124,0
80	139,5	158,0

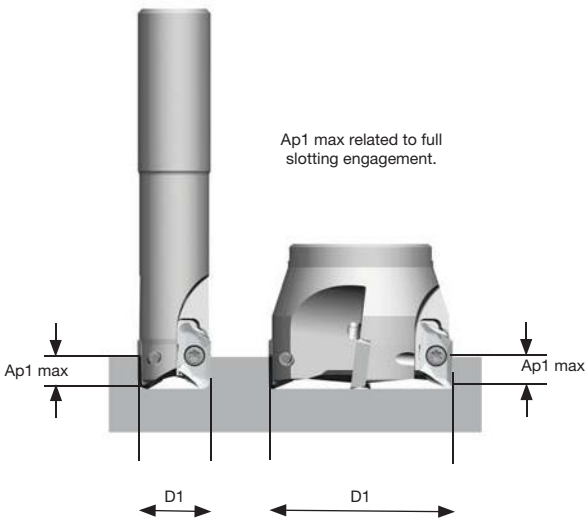
▼ Ap1 max at Helical Interpolation for 360° Tool Path

cutter diameter	Helical Interpolation depth Ap1 max for 360° tool path
25	4,06
32	4,06
40	4,06
50	4,06
63	4,06
80	4,06

NOTE: Ap max depending on cutter diameter, rigidity of the cutter, rigidity of the machine, and size of the flute.

▼ Ap1 max at Full Slotting

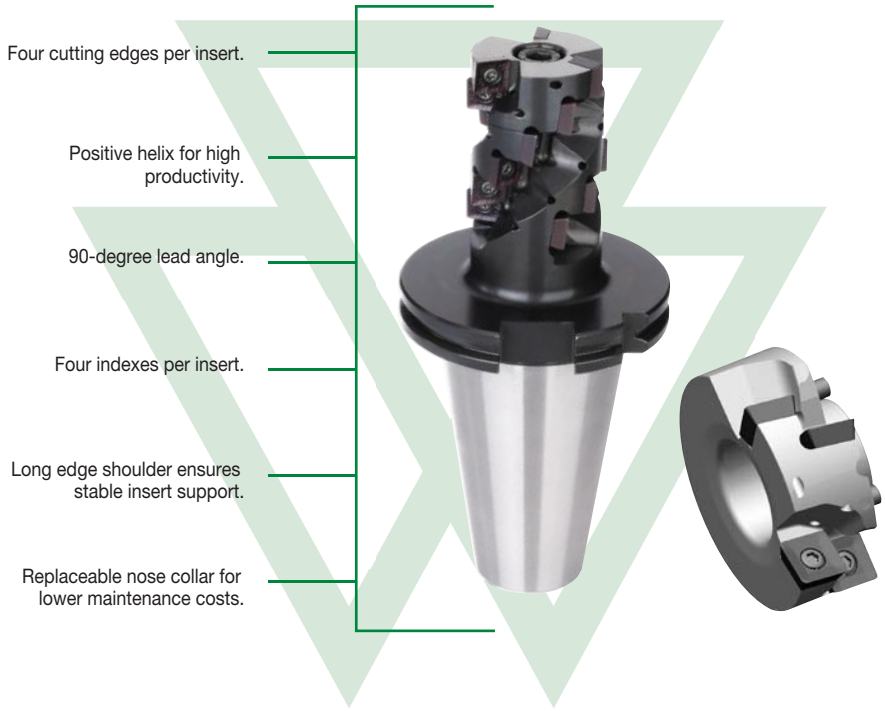
cutting diameter (D1)	Number of inserts Z	Ap1 max
25	2	7,5
32	2	11,0
32	3	6,0
40	3	9,0
50	4	9,0
63	4	11,0
80	5	11,0



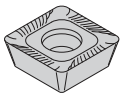
M390

M390 Helical Mill

The M390 helical mill uses a replaceable nose collar and positive helix to provide optimal chip evacuation and performance while maintaining lower maintenance costs.



INSERTS



-ML
Positive geometry for light machining or shouldering with small engagements.

-MM
First choice for general machining in all materials.

-MH
First choice for heavy machining in steel and cast iron.

FIRST CHOICE FOR HIGH-PRODUCTIVITY HELICAL MILLING

PRODUCT

SERIES

M390

DIAMETER RANGE

50–80mm

SHANK TYPES

Helical End Mills

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

SIDE MILLING/ SHOULDER MILLING: SQUARE END

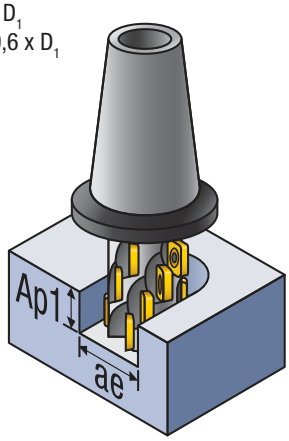
FACE MILLING

SLOTTING: SQUARE END

MAXIMUM CUTTING DEPTH (AP1) AND CONTACT WIDTH (AE) RATIOS BASED ON APPLICATION TYPE

SLOT MILLING

ae = 1 x D_1
Ap1 max = 0,6 x D_1

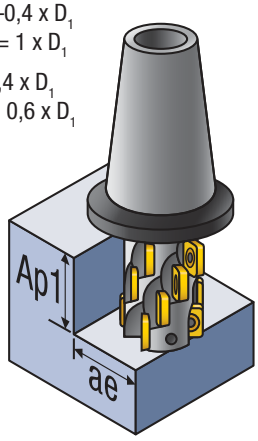


**Not recommended in ISO "H" materials.*

CONTOURING

ae = 0,25–0,4 x D_1
Ap1 max = 1 x D_1

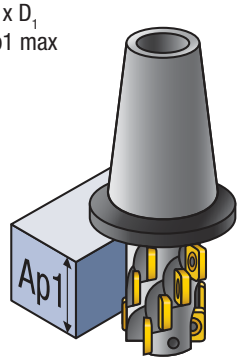
ae = >0,4 x D_1
Ap1 max = 0,6 x D_1



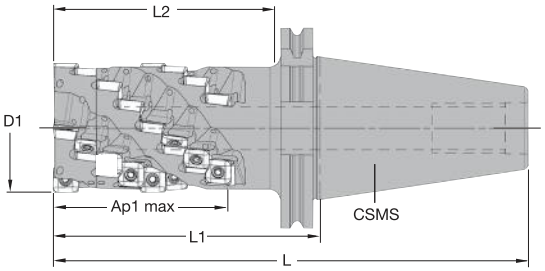
**Not recommended in ISO "H" materials.*

PROFILING

ae = <0,25 x D_1
Ap1 max = Ap1 max



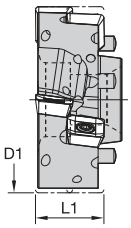
M390 • Integral SD1204.. • Metric



order number	catalogue number	D1	L	L1	L2	Ap1 max	Z	Z U	CSMS system size	max RPM	coolant supply	kg
2021422	**12393041200**	50	207	105	82	64,0	12	3	DV50	14000	Yes	3,4
2021423	**12393041400**	63	232	130	107	85,0	24	4	DV50	12000	Yes	4,3
2021424	**12393041800**	80	262	160	137	117,0	45	5	DV50	10500	Yes	6,3

NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

M390 • End Cap • Metric



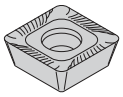
order number	catalogue number	D1	L1	Z U	Z	kg
2021428	**12393051200**	50	21	3	6	0,2
2021429	**12393051400**	63	21	4	8	0,3
2021430	**12393051800**	80	21	5	10	0,5

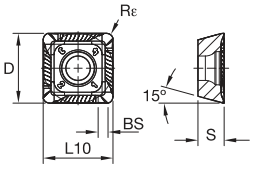
NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M390 • SDMT-ML • SD1204..



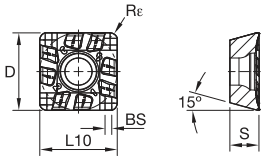


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	TTM08	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P			●	●	●		●	●	●	○	●
M			○	●			●	●	●	●	●
K	●	●	○	○		●		○			
N	○						○				○
S				●			●	○	○	●	●
H							○			○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	TTM08	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
SDMT1204PDRML	4	12,70	12,70	4,77	1,10	1,20	0,08	-	3094667	-	3020185	-	5427423	-	-	-	-	6180319
SDMT1204PDRML	4	12,70	12,70	4,77	1,10	1,20	–	-	-	-	-	-	-	-	6842094	-	-	-

M390 • SDMX-MM • SD1204..

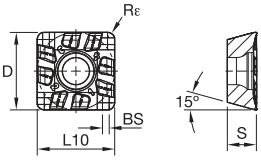


● first choice
○ alternate choice

	THM-U	TN6520	TN6525	TN6540	TTM08	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
P			●	●	●		●	●	●	○	●
M			○	●			●	●	●	●	●
K	●	●	○	○		●		○			
N	○						○				○
S				●			●	○	○	●	●
H							○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	TTM08	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
SDMX120408RMM	4	13	12,70	4,76	1,93	0,80	0,10	-	-	3950588	3950589	-	-	-	-	-	5522490	-
SDMX120412RMM	4	13	12,70	4,76	1,50	1,20	0,10	-	-	-	3950597	-	-	-	-	-	5519572	-
SDMX120416RMM	4	13	12,70	4,76	1,50	1,60	0,10	-	4145063	-	4145065	-	-	-	-	-	-	-
SDMX120424RMM	4	13	12,70	4,76	0,60	2,40	0,10	-	-	-	4145072	-	-	-	-	-	-	-
SDMX120432RMM	4	13	12,70	4,76	–	3,20	0,10	-	-	-	4145094	-	-	-	-	-	-	-

M390 • SDMX-MH • SD1204..

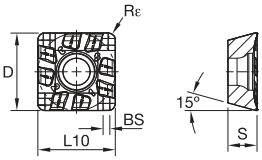


● first choice
○ alternate choice

P				●	●	●		●	●	●	○	●
M				○	●			●	●	●	●	●
K	●	●	○	○		●		○				
N	○							○				○
S				●				●	○	○	●	●
H								○			○	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	TTM08	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
SDMX120408RMH	4	13	12,70	4,76	1,93	0,80	0,14	-	-	-	3950592	-	5427427	-	-	-	-	-
SDMX120412RMH	4	13	12,70	4,76	1,54	1,20	0,14	-	3950614	3950601	3950603	-	5427428	-	-	-	-	-
SDMX120416RMH	4	13	12,70	4,76	1,50	1,60	0,14	-	-	-	3950607	-	-	-	-	-	-	-

M390 • SDMT-MH • SD1204..



● first choice
○ alternate choice

P				●	●	●		●	●	●	○	●
M				○	●			●	●	●	●	●
K	●	●	○	○		●		○				
N	○							○				○
S				●				●	○	○	●	●
H								○			○	

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U	TN6520	TN6525	TN6540	TTM08	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
SDMT1204PDRMH	4	12,70	12,70	4,81	1,10	1,20	0,14	-	-	3325040	3326330	-	5427422	-	-	-	-	-
SDMT1204PDRMH	4	12,70	12,70	4,81	1,10	1,20	–	-	-	-	-	-	-	-	6842068	-	-	-

M390 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P3–P4	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	WP35CM	**.S..MM**	**WS30PM**	.S..MH	WP35CM
K1–K2	.E..ML	WK15CM	**.E..ML**	**WK15CM**	.S..MH	WK15CM
K3	.E..ML	WK15CM	**.S..MM**	**TN6525**	.S..MH	TN6525
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540
S3	.E..ML	TN6540	**.S..MM**	**WS30PM**	.S..MM	TN6540
S4	.E..ML	TN6540	**.S..MM**	**WS30PM**	.S..MM	TN6540
H1	.S..MM	WS30PM	**.S..MM**	**WS30PM**	.S..MM	WS30PM

M390 • Recommended Starting Speeds [m/min]

Material Group		THM-U			TN6520			TN6525			TN6540			TTM08		
P	0	–	–	–	–	–	–	340	**265**	235	300	**235**	200	–	–	–
	1	–	–	–	–	–	–	340	**265**	235	300	**235**	200	230	**200**	190
	2	–	–	–	–	–	–	265	**210**	180	210	**160**	140	195	**170**	140
	3	–	–	–	–	–	–	235	**180**	155	180	**140**	115	180	**150**	125
	4	–	–	–	–	–	–	195	**140**	120	150	**110**	90	160	**130**	105
	5	–	–	–	–	–	–	260	**195**	165	200	**150**	125	–	–	–
	6	–	–	–	–	–	–	170	**135**	110	135	**100**	85	–	–	–
M	1	–	–	–	–	–	–	160	**100**	65	110	**65**	50	–	–	–
	2	–	–	–	–	–	–	100	**65**	40	65	**40**	35	–	–	–
	3	–	–	–	–	–	–	105	**65**	45	70	**40**	35	–	–	–
K	1	190	**170**	150	375	**265**	190	230	**205**	185	185	**170**	150	–	–	–
	2	–	–	–	325	**210**	160	180	**160**	150	145	**130**	115	–	–	–
	3	–	–	–	250	**190**	135	150	**135**	120	130	**120**	105	–	–	–
N	1	2000	**1200**	1000	–	–	–	–	–	–	–	–	–	–	–	–
	2	1365	**815**	665	–	–	–	–	–	–	–	–	–	–	–	–
	3	800	**500**	400	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**30**	25	–	–	–
	2	–	–	–	–	–	–	–	–	–	20	**15**	10	–	–	–
	3	–	–	–	–	–	–	–	–	–	60	**35**	25	–	–	–
	4	–	–	–	–	–	–	–	–	–	50	**25**	20	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WK15CM			WP25PM			WP35CM			WP40PM			WS30PM			WS40PM		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1	–	–	–	330	**285**	270	455	**395**	370	295	**260**	245	–	–	–	280	**245**	230
	2	–	–	–	275	**240**	200	280	**255**	230	250	**215**	180	–	–	–	235	**205**	170
	3	–	–	–	255	**215**	175	255	**230**	205	230	**195**	160	–	–	–	215	**185**	150
	4	–	–	–	225	**185**	150	190	**175**	160	205	**170**	135	–	–	–	195	**160**	130
	5	–	–	–	185	**170**	150	260	**230**	210	170	**155**	135	–	–	–	160	**140**	130
	6	–	–	–	165	**125**	100	160	**135**	110	150	**115**	90	–	–	–	140	**110**	85
M	1	–	–	–	205	**180**	165	205	**185**	155	195	**170**	155	225	**200**	185	260	**190**	115
	2	–	–	–	185	**160**	130	185	**160**	140	175	**150**	125	205	**180**	145	230	**170**	105
	3	–	–	–	140	**120**	95	145	**130**	115	130	**115**	90	155	**135**	105	190	**140**	80
K	1	420	**385**	340	230	**205**	185	295	**265**	240	–	–	–	–	–	–	–	–	–
	2	335	**295**	275	180	**160**	150	235	**210**	190	–	–	–	–	–	–	–	–	–
	3	280	**250**	230	150	**135**	120	195	**175**	160	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1075	**945**	945
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	945	**875**	845
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	875	**760**	760
S	1	–	–	–	40	**35**	25	–	–	–	40	**35**	30	45	**40**	30	62	**45**	27
	2	–	–	–	40	**35**	25	–	–	–	40	**35**	30	45	**40**	30	55	**40**	26
	3	–	–	–	50	**40**	25	–	–	–	50	**40**	30	55	**45**	30	64	**46**	29
	4	–	–	–	70	**50**	35	66	**50**	33	65	**50**	35	85	**60**	40	90	**66**	42
H	1	–	–	–	120	**90**	70	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M390 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..ALP	0,12	0,23	0,46	0,08	0,17	0,33	0,06	0,13	0,25	0,06	0,11	0,22	0,05	0,10	0,20	.F..ALP
.E..ML	0,12	0,35	0,58	0,08	0,25	0,42	0,06	0,19	0,31	0,06	0,17	0,27	0,05	0,15	0,25	.E..ML
.S..MM	0,12	0,42	0,70	0,08	0,30	0,50	0,06	0,23	0,38	0,06	0,20	0,33	0,05	0,18	0,30	.S..MM
.S..MH	0,23	0,54	0,85	0,17	0,39	0,61	0,13	0,29	0,46	0,11	0,25	0,40	0,10	0,23	0,36	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.

widia.com

WIDIA™

M300 Series

M300, M300+ Helical Mills

The M300 Series helical mill is a dependable, general-purpose series designed to provide high metal removal rates and consistent performance.

Wide selection of inserts to machine all material types.

Positive spiral design for smooth cutting.

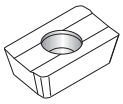
Full effective teeth design provides high performance.

Through tool coolant.

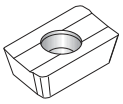
Replaceable nose collar and possible spacer ring offers flexibility.

INSERTS

M300+

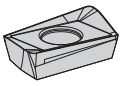


-ALP
First choice for aluminum and non-ferrous alloy machining.

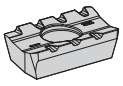


-AL
First choice for aluminum and non-ferrous alloy machining.

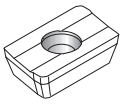
M300



-GE
First choice for light machining in steel, stainless steel, and cast iron.



-MR
First choice for heavy machining and unstable conditions.



-XP..16
First choice for general machining operations in steel and cast iron.

RELIABLE OPTION FOR GENERAL-PURPOSE HELICAL MILLING

PRODUCT

SERIES

M300

DIAMETER RANGE

50–80mm

SHANK TYPES

Helical End Mills

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

SIDE MILLING/ SHOULDER MILLING: SQUARE END

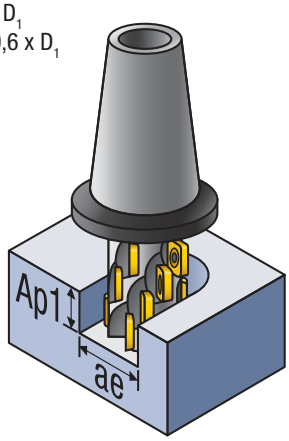
FACE MILLING

SLOTTING: SQUARE END

MAXIMUM CUTTING DEPTH (AP1) AND CONTACT WIDTH (AE) RATIOS BASED ON APPLICATION TYPE

SLOT MILLING

ae = 1 x D_1
Ap1 max = 0,6 x D_1

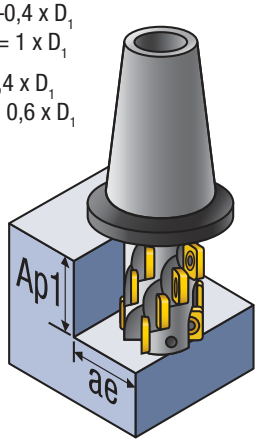


*Not recommended in ISO "H" materials.

CONTOURING

ae = 0,25–0,4 x D_1
Ap1 max = 1 x D_1

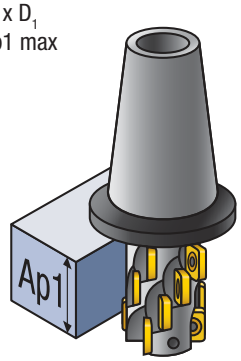
ae = >0,4 x D_1
Ap1 max = 0,6 x D_1



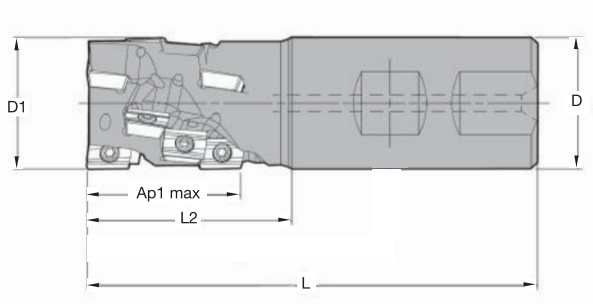
*Not recommended in ISO "H" materials.

PROFILING

ae = <0,25 x D_1
Ap1 max = Ap1 max



M300+ • Weldon® Shank • Metric



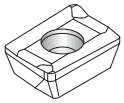
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	Z U	max RPM	coolant supply	kg
2021407	**12393001200**	25	25	96	40	28,0	6	2	26100	Yes	0,3
2021408	**12393001400**	32	32	110	50	37,0	12	3	23000	Yes	0,6
2021409	**12393001600**	40	32	120	60	46,0	15	3	20600	Yes	0,7

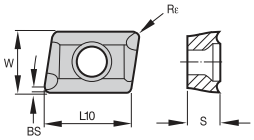
NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification. For tool body modification instructions, see page A114.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M300+ • AONT-ML



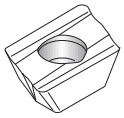


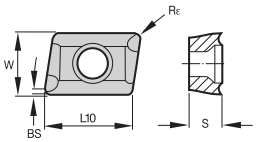
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
AONT10T308ML	2	7,50	10,37	3,92	1,00	0,80	0,08	2031642	ı	ı	ı	ı	2957823	2957762	ı	2957760	ı	ı	ı	ı	ı	ı	ı

M300+ • AONT-MH





● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
AONT10T308MH	2	7,54	10,44	3,97	1,00	0,80	0,12	ı	ı	ı	ı	ı	ı	ı	2957827	2957824	ı	ı	ı	ı	ı	ı	ı

M300+ • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	XPHT-GE	WP40PM	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P3–P4	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P5–P6	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
M1–M2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
M3	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT-MR	TN6540
K1–K2	XPHT-GE	TN6510	**XPHT..**	**TN6520**	XPHT-MR	WK15CM
K3	XPHT-GE	TN6510	**XPHT..**	**TN6540**	XPHT-MR	WK15CM
N1–N2	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
N3	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
S1–S2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S3	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S4	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
H1	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540

M300+ • Recommended Starting Speeds [m/min]

Material Group		THR			THM-U			TN6501			TN6502			TN6510			TN6520			TN6525			TN6540		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	265	**210**	180	210	**160**	140
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	235	**180**	155	180	**140**	115
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	195	**140**	120	150	**110**	90
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	260	**195**	165	200	**150**	125
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	170	**135**	110	135	**100**	85
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**100**	65	110	**65**	50
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	**65**	40	65	**40**	35
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	105	**65**	45	70	**40**	35
K	1	150	**135**	120	190	**170**	150	–	–	–	–	–	–	400	**290**	215	375	**265**	190	230	**205**	185	185	**170**	150
	2	185	**140**	120	–	–	–	–	–	–	–	–	–	350	**235**	170	325	**210**	160	180	**160**	150	145	**130**	115
	3	105	**75**	50	–	–	–	–	–	–	–	–	–	280	**215**	165	250	**190**	135	150	**135**	120	130	**120**	105
N	1	900	**600**	500	2000	**1200**	1000	2000	**1200**	1000	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	1365	**815**	665	1365	**815**	665	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	800	**500**	400	800	**500**	400	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–
S	1	35	**25**	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**30**	25
	2	25	**20**	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	**15**	10
	3	50	**40**	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	**35**	25
	4	35	**25**	18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**25**	20
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TTM08			WK15PM			WP35CM			WU20PM			TTI25			THM			WK15CM			WP40PM			WS30PM		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	1	230	**200**	190	–	–	–	455	**395**	370	330	**290**	270	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	2	195	**170**	140	–	–	–	280	**255**	230	275	**250**	200	260	**210**	180	–	–	–	–	–	–	250	**215**	180	–	–	–
	3	180	**150**	125	–	–	–	255	**230**	205	255	**220**	175	260	**210**	180	–	–	–	–	–	–	230	**195**	160	–	–	–
	4	160	**130**	105	–	–	–	190	**175**	160	225	**190**	150	220	**180**	150	–	–	–	–	–	–	205	**170**	135	–	–	–
	5	–	–	–	–	–	–	260	**230**	210	185	**175**	150	265	**195**	165	–	–	–	–	–	–	170	**155**	135	–	–	–
	6	–	–	–	–	–	–	160	**135**	110	165	**130**	100	120	**90**	75	–	–	–	–	–	–	150	**115**	90	–	–	–
M	1	–	–	–	–	–	–	205	**185**	155	205	**180**	165	400	**260**	180	–	–	–	–	–	–	195	**170**	155	225	**200**	185
	2	–	–	–	–	–	–	185	**160**	140	185	**160**	130	270	**170**	120	–	–	–	–	–	–	175	**150**	125	205	**180**	145
	3	–	–	–	–	–	–	145	**130**	115	140	**120**	95	265	**175**	120	–	–	–	–	–	–	130	**115**	90	155	**135**	105
K	1	–	–	–	400	**290**	215	295	**265**	240	250	**220**	185	185	**155**	130	–	–	–	420	**385**	340	–	–	–	–	–	–
	2	–	–	–	350	**235**	170	235	**210**	190	200	**180**	150	150	**120**	105	–	–	–	335	**295**	275	–	–	–	–	–	–
	3	–	–	–	280	**215**	165	195	**175**	160	180	**150**	120	120	**105**	85	–	–	–	280	**250**	230	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	400	**350**	300	–	–	–	560	**485**	420	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	2	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	3	–	–	–	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**45**	30
	4	–	–	–	–	–	–	66	**50**	33	70	**50**	35	–	–	–	–	–	–	–	–	–	65	**50**	35	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	110	**80**	70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

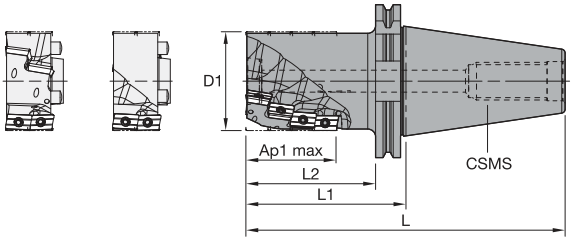
M300+ • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
XPHT-ALP	0,12	**0,35**	0,58	0,08	**0,25**	0,42	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	XPHT-ALP
XPHT-GE	0,19	**0,47**	0,70	0,14	**0,34**	0,50	0,11	**0,26**	0,38	0,09	**0,22**	0,33	0,08	**0,20**	0,30	XPHT-GE
XPHT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPHT..
XPNT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPNT..
XPHT-MR	0,23	**0,59**	0,92	0,17	**0,43**	0,66	0,13	**0,32**	0,50	0,11	**0,28**	0,43	0,10	**0,25**	0,40	XPHT-MR

NOTE: Use "Light Machining" value as starting feed rate.

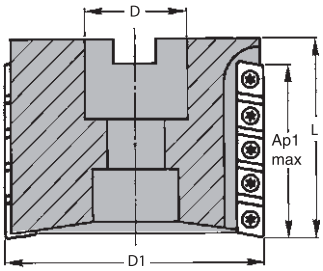
M300 • Integral • Metric



order number	catalogue number	D1	L	L1	L2	Ap1 max	Z	Z U	CSMS system size	max RPM	coolant supply	kg
2021419	**12393040200**	50	217	115	96	70,0	9	3	DV50	13090	Yes	3,7
2021420	**12393040400**	63	232	130	111	84,0	12	3	DV50	11690	Yes	4,3
2021421	**12393040800**	80	257	155	136	112,0	24	4	DV50	10360	Yes	6,0

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.
For tool body modification instructions, see page A114.
Z = number of pocket seats.
ZU = number of effective teeth.

M300 • Shell Mills • Metric



order number	catalogue number	D1	D	L	Ap1 max	Z	Z U	max RPM	coolant supply	kg
2021434	**12393080200**	50	22	50	28,0	6	3	13090	No	0,4
2021437	**12393083200**	50	22	65	42,0	12	4	13090	No	0,5
2021435	**12393080400**	63	27	61	42,0	9	3	11690	No	0,8
2021438	**12393083400**	63	27	75	56,0	20	5	11690	No	1,0
2021436	**12393080600**	80	32	70	56,0	16	4	10360	No	1,5
2021439	**12393083600**	80	32	85	70,0	30	6	10360	No	2,0

NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.
For tool body modification instructions, see page A114.
Z = number of pocket seats.
ZU = number of effective teeth.

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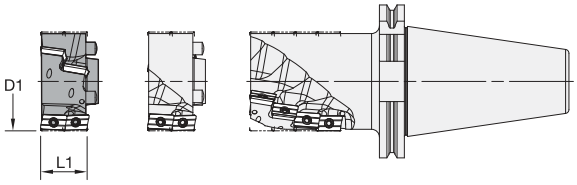
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

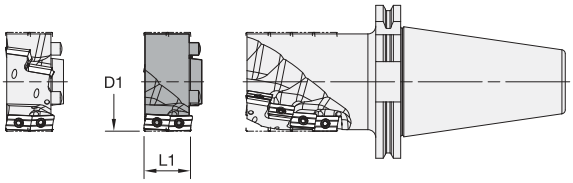
M300 • End Cap • Metric



order number	catalogue number	D1	L1	Z U	Z	kg
2021431	**12393060200**	50	29	3	6	0,3
2021432	**12393060400**	63	29	3	6	0,4
2021433	**12393060800**	80	29	4	8	0,7

NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

M300 • Extension Unit • Metric



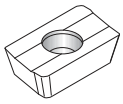
order number	catalogue number	D1	L1	Z U	Z	kg
2021425	**12393050200**	50	28	3	6	0,3
2021426	**12393050400**	63	28	3	6	0,3

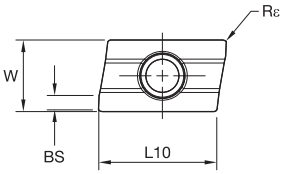
NOTE: One spacer ring can be added to any M300 integral tool body assembly with matching D1.
Standard assembly cap screw must be replaced with the following part for correct mounting bolt length:
50mm — use longer socket head cap screw #12146030700 (M12 x 70).
63mm and 80mm — use longer socket head cap screw #12146030800 (M16 x 70).
Z = number of pocket seats.
ZU = number of effective teeth.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M300 • XPHT-ALP



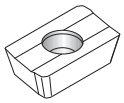


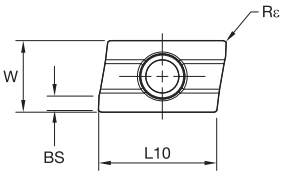
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160404ALP	2	9,80	15,67	4,66	1,70	0,40	0,08	-	2031794	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160408ALP	2	9,80	15,67	4,66	1,70	0,80	0,08	-	2031797	-	2964136	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160412ALP	2	9,80	15,67	4,66	1,40	1,20	0,08	-	2031799	-	-	-	-	-	-	-	-	-	-	-	-	-	-

M300 • XPHT-AL



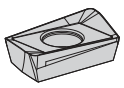


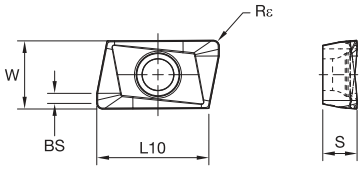
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160408AL	2	9,80	15,67	4,66	1,70	0,80	0,08	2031796	-	-	-	2963902	-	-	-	-	-	-	-	-	-	-	-
XPHT160412AL	2	9,80	15,67	4,66	1,40	1,20	0,08	2031798	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160416AL	2	9,80	15,67	4,66	0,90	1,60	0,08	2031801	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160420AL	2	9,80	15,67	4,66	1,20	2,00	0,08	2031802	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160425AL	2	9,80	15,67	4,66	1,20	2,50	0,08	2029067	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160432AL	2	9,80	15,67	4,66	1,20	3,18	0,08	2031804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XPHT160440AL	2	9,80	15,67	4,66	1,20	4,00	0,08	2029073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

M300 • XPHT-GE



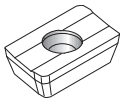


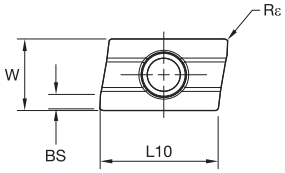
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160408ERGE	2	9,44	15,67	4,76	1,80	0,80	0,12	-	-	-	-	-	2964172	-	2964176	2964170	2405344	-	5427399	-	-	5519888	-
XPHT160412ERGE	2	9,44	15,67	4,76	1,50	1,20	0,12	-	-	-	-	-	-	2964173	2964175	2964179	-	-	5427420	-	-	-	-

M300 • XPHT



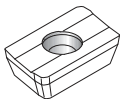


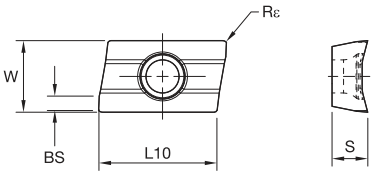
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160408	2	9,53	15,67	4,76	1,80	0,80	0,16	-	-	-	-	-	-	2964168	-	2964164	-	-	5427389	-	5645177	-	-
XPHT160412	2	9,53	15,67	4,76	1,50	1,20	0,16	2025362	-	2029049	-	-	2964169	2964167	2964180	2964165	2029048	2029050	5427396	-	5645178	-	-
XPHT160416	2	9,53	15,67	4,76	0,80	1,60	0,16	-	-	-	-	-	-	-	-	2964166	-	-	5427391	-	5645179	-	-
XPHT160420	2	9,53	15,67	4,76	0,50	2,00	0,16	-	-	-	-	-	-	-	-	-	-	-	5427398	-	5645210	-	-
XPHT160425	2	9,53	15,67	4,76	1,20	2,50	0,16	-	-	-	-	-	-	-	-	-	-	-	5427392	-	5645211	-	-
XPHT160432	2	9,53	15,67	4,76	1,20	3,17	0,16	-	-	-	-	-	-	-	-	-	-	-	-	-	5645212	-	-
XPHT160440	2	9,53	15,67	4,76	1,20	4,00	0,16	-	-	-	-	-	-	-	-	-	-	-	5427394	-	5645213	-	-

M300 • XPNT



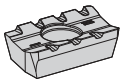


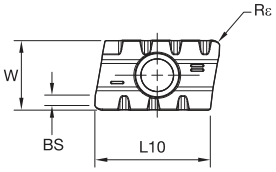
● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
XPNT160412	2	9,53	15,88	4,79	1,20	1,20	0,16	-	-	-	-	-	-	-	2964141	2964174	-	2029075	5427395	-	-	-	-

M300 • XPHT-MR





● first choice
○ alternate choice

	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
P								●	●	●	●		●	●	○	●
M								○	●	○			●	●	●	●
K	○	●	○			●	●	○	○	○		●	○			○
N	●	○	○	●	●											○
S			○						●				○	○	●	○
H															○	○

catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM	THM-U	THR	TN6501	TN6502	TN6510	TN6520	TN6525	TN6540	TTI25	TTM08	WK15CM	WP35CM	WP40PM	WS30PM	WU20PM
XPHT160412MR	2	9,53	15,77	4,76	1,70	1,20	0,18	'	'	'	'	'	'	'	'	2964142	'	'	5427390	'	'	'	'

M300 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XPHT-GE	WP40PM	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P3–P4	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
P5–P6	XPHT-GE	TN6540	**XPHT..**	**WP40PM**	XPHT..	WP40PM
M1–M2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
M3	XPHT-GE	TN7535	**XPHT..**	**WP40PM**	XPHT-MR	TN7535
K1–K2	XPHT-GE	TN6510	**XPHT..**	**TN6520**	XPHT-MR	WK15CM
K3	XPHT-GE	TN6510	**XPHT..**	**TN7535**	XPHT-MR	WK15CM
N1–N2	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
N3	XPHT-ALP	TN6501	**XPHT-ALP**	**TN6501**	XPHT-ALP	TN6501
S1–S2	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S3	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540
S4	XPHT-GE	TN6540	**XPHT..**	**TN6540**	XPHT-MR	TN6540
H1	XPHT-GE	WS30PM	**XPHT..**	**TN6540**	XPHT-MR	TN6540

M300 • Recommended Starting Speeds [m/min]

Material Group		THR			THM-U			TN6501			TN6502			TN6510			TN6520			TN6525			TN6540		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	265	**210**	180	210	**160**	140
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	235	**180**	155	180	**140**	115
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	195	**140**	120	150	**110**	90
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	260	**195**	165	200	**150**	125
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	170	**135**	110	135	**100**	85
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**100**	65	110	**65**	50
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	**65**	40	65	**40**	35
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	105	**65**	45	70	**40**	35
K	1	150	**135**	120	190	**170**	150	–	–	–	–	–	–	400	**290**	215	375	**265**	190	230	**205**	185	185	**170**	150
	2	185	**140**	120	–	–	–	–	–	–	–	–	–	350	**235**	170	325	**210**	160	180	**160**	150	145	**130**	115
	3	105	**75**	50	–	–	–	–	–	–	–	–	–	280	**215**	165	250	**190**	135	150	**135**	120	130	**120**	105
N	1	900	**600**	500	2000	**1200**	1000	2000	**1200**	1000	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	1365	**815**	665	1365	**815**	665	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	800	**500**	400	800	**500**	400	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–
S	1	35	**25**	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**30**	25
	2	25	**20**	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	**15**	10
	3	50	**40**	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	**35**	25
	4	35	**25**	18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**25**	20
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TTM08			WK15PM			WP35CM			WU20PM			TTI25			THM			WK15CM			WP40PM			WS30PM		
P	0	–	–	–	–	–	–	–	–	–	–	–	–	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	1	230	**200**	190	–	–	–	455	**395**	370	330	**290**	270	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	2	195	**170**	140	–	–	–	280	**255**	230	275	**250**	200	260	**210**	180	–	–	–	–	–	–	250	**215**	180	–	–	–
	3	180	**150**	125	–	–	–	255	**230**	205	255	**220**	175	260	**210**	180	–	–	–	–	–	–	230	**195**	160	–	–	–
	4	160	**130**	105	–	–	–	190	**175**	160	225	**190**	150	220	**180**	150	–	–	–	–	–	–	205	**170**	135	–	–	–
	5	–	–	–	–	–	–	260	**230**	210	185	**175**	150	265	**195**	165	–	–	–	–	–	–	170	**155**	135	–	–	–
	6	–	–	–	–	–	–	160	**135**	110	165	**130**	100	120	**90**	75	–	–	–	–	–	–	150	**115**	90	–	–	–
M	1	–	–	–	–	–	–	205	**185**	155	205	**180**	165	400	**260**	180	–	–	–	–	–	–	195	**170**	155	225	**200**	185
	2	–	–	–	–	–	–	185	**160**	140	185	**160**	130	270	**170**	120	–	–	–	–	–	–	175	**150**	125	205	**180**	145
	3	–	–	–	–	–	–	145	**130**	115	140	**120**	95	265	**175**	120	–	–	–	–	–	–	130	**115**	90	155	**135**	105
K	1	–	–	–	400	**290**	215	295	**265**	240	250	**220**	185	185	**155**	130	–	–	–	420	**385**	340	–	–	–	–	–	–
	2	–	–	–	350	**235**	170	235	**210**	190	200	**180**	150	150	**120**	105	–	–	–	335	**295**	275	–	–	–	–	–	–
	3	–	–	–	280	**215**	165	195	**175**	160	180	**150**	120	120	**105**	85	–	–	–	280	**250**	230	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	550	**470**	400	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	400	**350**	300	–	–	–	560	**485**	420	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	2	–	–	–	–	–	–	–	–	–	40	**35**	25	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	3	–	–	–	–	–	–	–	–	–	50	**40**	25	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**45**	30
	4	–	–	–	–	–	–	66	**50**	33	70	**50**	35	–	–	–	–	–	–	–	–	–	65	**50**	35	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	110	**80**	70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M300 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
XPHT-ALP	0,12	**0,35**	0,58	0,08	**0,25**	0,42	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	XPHT-ALP
XPHT-GE	0,19	**0,47**	0,70	0,14	**0,34**	0,50	0,11	**0,26**	0,38	0,09	**0,22**	0,33	0,08	**0,20**	0,30	XPHT-GE
XPHT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPHT..
XPNT..	0,22	**0,56**	0,82	0,16	**0,40**	0,59	0,12	**0,30**	0,44	0,10	**0,26**	0,38	0,10	**0,24**	0,35	XPNT..
XPHT-MR	0,23	**0,59**	0,92	0,17	**0,43**	0,66	0,13	**0,32**	0,50	0,11	**0,28**	0,43	0,10	**0,25**	0,40	XPHT-MR

NOTE: Use "Light Machining" value as starting feed rate.

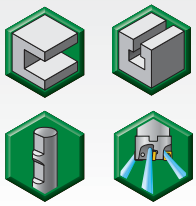
Slotting Mills

Find the offering of slotting mills at ***widia.com***

M16 T-SLOTTING

Designed for maximum chip evacuation and optimum security, the M16 slot mill series is an excellent choice for T-slot milling of steel and cast iron materials.

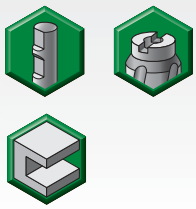
APPLICATIONS



M94 PRECISE SLOTTING AND GROOVING

Designed for the most demanding small width slotting and grooving operations, the M94 slot mill series is an excellent choice for thin slotting and grooving of steel, stainless steel, and cast iron materials.

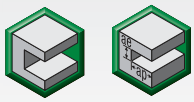
APPLICATIONS



M95 SQUARE STYLE INSERT SLOTTING

The M95 slotting cutter is designed for deeper applications that require the cutting load to be shared from one insert to the other. Use in steel, stainless steel, and cast iron materials.

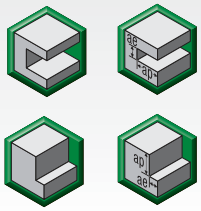
APPLICATIONS



M900 ADJUSTABLE SLOTTING

The M900 slotting cutter is a multipurpose slotting cutter with high-precision capabilities in numerous operations. Use on steel, stainless steel, cast iron, and superalloys.

APPLICATIONS



M16

M16 T-Slotting Mill

Use the M16 T-slot mill to create slots in steel and cast iron materials.

Strong and sturdy tool design for secure machining in steel and cast iron.

Chip gash designed for streamlined chip evacuation.

CPNT inserts with a positive chip breaker provide low cutting forces.

The tough tool body is designed to machine steel and cast iron while still allowing smooth chip evacuation for a uniform surface finish.

CPNT

P M K

Inserts with positive chipbreaker providing low cutting forces.

SMOOTH

The optimized chip gash design provides smooth chip evacuation.

SECURE

The strong and rigid tool body is reliable when machining steel and cast iron.

SMOOTH AND SECURE WITH M16

PRODUCT

SERIES

M16

DIAMETER RANGE

25–50mm

Slot Width Range:
11–21,9mm

SHANK TYPES

Weldon® End Mills

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

SLOTTING: SIDE

SLOTTING: T

WELDON SHANK: WELDON 2 FLAT

THROUGH COOLANT: MILLING

T-SLOTTING

STEEL

- If machining a vertical slot, minimize depth; reference Figure 1. If the depth is greater than Figure 1, chip evacuation problems could occur.
- Vibrations could occur when the T-slot cutter diameter increases; use Figure 1 as the starting point. If vibrations are a concern, adopt the Figure 2 solution.

CAST IRON

- Fewer problems with chip evacuation and reduced cutting forces enable deeper vertical slots as shown in Figures 2 and 3.

FIGURE 1

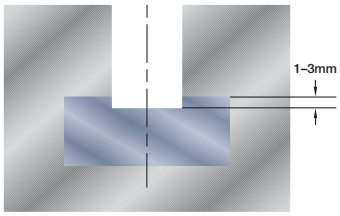


FIGURE 2

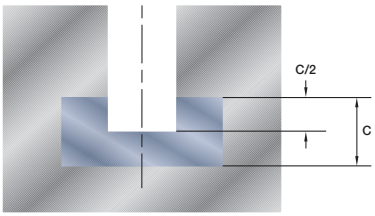
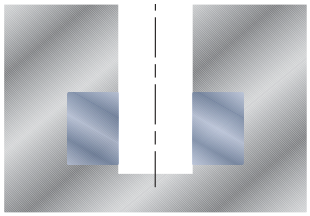
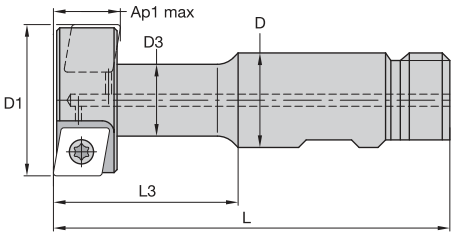


FIGURE 3



NOTE: Air blast is recommended to disperse the chips.

M16 • Weldon® Shank • Metric



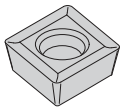
order number	catalogue number	D1	D	D3	L	L3	Ap1 max	Z	Z U	insert 1	coolant supply	kg
2021380	**12391602600M**	25	16	13	80	32	11,0	4	2	CPNT060204T	Yes	0,1
2021381	**12391603000**	32	16	15	90	42	13,9	4	2	CPNT080308T	Yes	0,2
2021382	**12391603400**	40	25	19	105	49	17,9	4	2	CPNT09T308T	Yes	0,4
2021383	**12391603800**	50	32	25	120	60	21,9	4	2	CPNT120408T	Yes	0,7

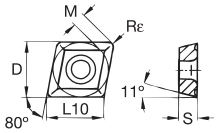
NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M16 • CPNT • CP0602..



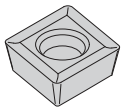


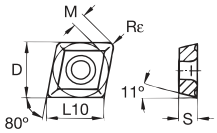
● first choice
○ alternate choice

P			●		●	●
M					●	●
K		○		●	○	
N		●				
S					○	○
H						

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT060204T	2	6,35	6,45	1,54	2,38	0,40	0,09	2022086	-	-	-	-
CPNT060204T	2	6,35	6,45	1,54	2,38	0,40	0,03	-	-	5903680	5903676	5578222

M16 • CPNT • CP0803..



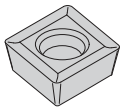


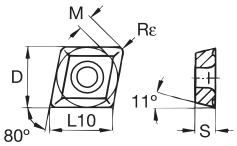
● first choice
○ alternate choice

P			●		●	●
M					●	●
K		○		●	○	
N		●				
S					○	○
H						

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT080308T	2	7,94	8,06	1,76	3,18	0,80	0,09	2022089	-	5903701	5903677	-
CPNT080308T	2	7,94	8,06	1,76	3,18	0,80	0,04	-	2022090	-	-	-

M16 • CPNT • CP09T3..



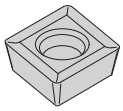


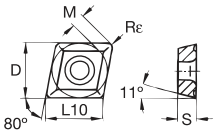
● first choice
○ alternate choice

	THM	TTM08	WK15CM	WP35CM	WP40PM
P		●		●	●
M				●	●
K	○		●	○	
N	●				
S				○	○
H					

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT09T308T	2	9,52	9,67	2,20	3,97	0,80	0,04	-	2022092	5903702	5903678	-

M16 • CPNT • CP1204..





● first choice
○ alternate choice

	THM	TTM08	WK15CM	WP35CM	WP40PM
P		●		●	●
M				●	●
K	○		●	○	
N	●				
S				○	○
H					

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT120408T	2	12,70	12,90	3,08	4,76	0,80	0,03	-	2022095	5903703	5903679	-

M16 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	CPNT	WP40PM	**CPNT**	**WP40PM**	CPNT	WP40PM
P3–P4	CPNT	WP35CM	**CPNT**	**WP35CM**	CPNT	WP35CM
P5–P6	CPNT	WP35CM	**CPNT**	**WP40PM**	CPNT	WP40PM
M1–M2	CPNT	WP40PM	**CPNT**	**WP40PM**	CPNT	WP40PM
M3	CPNT	TN7535	**CPNT**	**WP35CM**	CPNT	WP35CM
K1–K2	CPNT	WK15CM	**CPNT**	**WK15CM**	CPNT	WK15CM
K3	CPNT	WK15CM	**CPNT**	**WP35CM**	CPNT	WP35CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	–	–	**–**	**–**	–	–
H1	–	–	**–**	**–**	–	–

M16 • Recommended Starting Speeds [m/min]

Material Group		THM			TTM08			WK15CM			WP35CM			WP40PM		
P	0	–	**–**	–	–	**–**	–	–	**–**	–	455	**395**	370	295	**260**	245
	1	–	**–**	–	230	**200**	190	–	**–**	–	455	**395**	370	295	**260**	245
	2	–	**–**	–	195	**170**	140	–	**–**	–	280	**255**	230	250	**215**	180
	3	–	**–**	–	180	**150**	125	–	**–**	–	255	**230**	205	230	**195**	160
	4	–	**–**	–	160	**130**	105	–	**–**	–	190	**175**	160	205	**170**	135
	5	–	**–**	–	–	**–**	–	–	**–**	–	260	**230**	210	170	**155**	135
	6	–	**–**	–	–	**–**	–	–	**–**	–	160	**135**	110	150	**115**	90
M	1	–	**–**	–	–	**–**	–	–	**–**	–	205	**185**	155	195	**170**	155
	2	–	**–**	–	–	**–**	–	–	**–**	–	185	**160**	140	175	**150**	125
	3	–	**–**	–	–	**–**	–	–	**–**	–	145	**130**	115	130	**115**	90
K	1	120	**90**	75	–	**–**	–	420	**385**	340	295	**265**	240	–	**–**	–
	2	125	**100**	70	–	**–**	–	335	**295**	275	235	**210**	190	–	**–**	–
	3	130	**95**	60	–	**–**	–	280	**250**	230	195	**175**	160	–	**–**	–
N	1	900	**600**	500	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	685	**465**	385	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	450	**280**	200	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	40	**35**	30
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	40	**35**	30
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	50	**40**	30
	4	–	**–**	–	–	**–**	–	–	**–**	–	66	**50**	33	65	**50**	35
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
CPNT06	0,12	0,29	0,46	0,09	0,21	0,33	0,07	0,16	0,25	0,06	0,14	0,22	0,05	0,13	0,20	CPNT06
CPNT08	0,12	0,29	0,46	0,09	0,21	0,33	0,07	0,16	0,25	0,06	0,14	0,22	0,05	0,13	0,20	CPNT08
CPNT09	0,12	0,29	0,46	0,08	0,21	0,33	0,06	0,16	0,25	0,06	0,14	0,22	0,05	0,13	0,20	CPNT09
CPNT12	0,12	0,35	0,58	0,08	0,25	0,42	0,06	0,19	0,32	0,06	0,16	0,28	0,05	0,15	0,25	CPNT12

NOTE: Use "Light Machining" value as starting feed rate.

VXF™ Series

VXF-07, VXF-09, VXF-12, VXF-16 High-Feed Mills

The VXF Series high-feed mills have a nickel-plated body and four durable cutting edges to run at high feeds in deep cavities on primarily steel, stainless steel, titanium, and high-temp alloys.

VXF-07
Ap1 Max: 0,9mm
Fz Max: 1,2mm/z

VXF-12
Ap1 Max: 2,5mm
Fz Max: 3,0mm/z

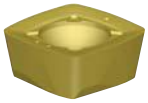
VXF-09
Ap1 Max: 1,5mm
Fz Max: 2,0mm/z

VXF-16
Ap1 Max: 3,5mm
Fz Max: 2,0mm/z

ALL-IN-ONE INSERT STYLE COMBINED FROM SQUARE AND ROUND DESIGNS TO ACHIEVE POWERFUL HIGH FEEDS

VXF-07

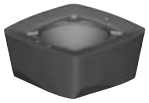
-MM



P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

-MH



P K H

First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs and hardened steel up to 48 HRC.

VXF-09

-MM

P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

-MH

P K H

First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs.

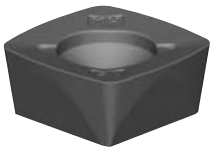
VXF-12

-MM

P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

-MH

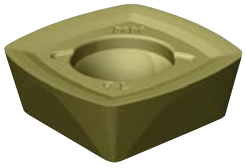


P K H

First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs.

VXF-16

-MM



P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

HIGH FEEDS, DEEP CAVITIES

PRODUCT		INSERTS		
SERIES	DIAMETER RANGE	INSERT TYPE	GRADE	MATERIALS
VXF-07	16–50mm	MM, MH	WP40PM, WS40PM, WP25PM, WU10PM	P M K S H
VXF-09	25–63mm	MM, MH	WS40PM, WP25PM, WP40PM	P M S
VXF-12	32–100mm	MM, MH	WS40PM, WP25PM, WP40PM	P M K S H
VXF-16	50–125mm	MM	WS40PM, WP25PM	P M S

APPLICATIONS

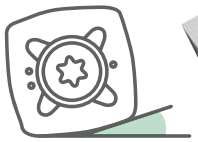
FACE MILLING | 3D PROFILING | POCKETING | HELICAL MILLING | RAMPING BLANK | SLOTTING: TROCHOIDAL MILLING | PLUNGE MILLING

INDUSTRY

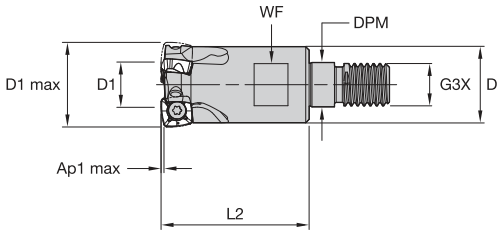
16,5º

LEAD ANGLE

redistributes cutting forces in the spindle z-axis direction.

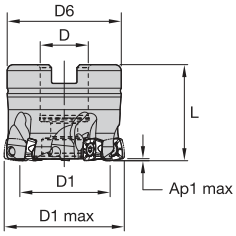


VXF-07 • Screw-On End Mills • Metric



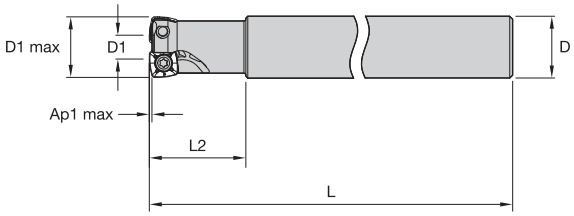
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597130	VXF016Z02M08XP07	16	7	13	8,5	M8	25	10	0,9	2	5.9°	65000	Yes	0,02
6597151	VXF020Z03M10XP07	20	11	18	10,5	M10	35	15	0,9	3	3.4°	57000	Yes	0,07
6597152	VXF025Z04M12XP07	25	16	21	12,5	M12	35	17	0,9	4	2.2°	49000	Yes	0,09
6597153	VXF032Z05M16XP07	32	23	29	17,0	M16	43	24	0,9	5	1.4°	41500	Yes	0,22

VXF-07 • Shell Mills • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597158	VXF040Z05S16XP07	40	31	16	37	32	0,9	5	1.0°	35000	Yes	0,19
6597159	VXF050Z07S22XP07	50	41	22	42	40	0,9	7	.7°	31300	Yes	0,32

VXF-07 • Cylindrical End Mills • Metric

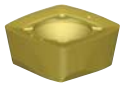


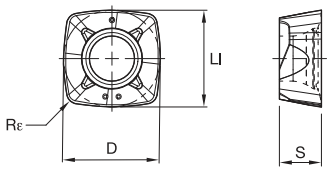
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597154	VXF016Z02A16XP07L180	16	7	16	180	25	0,9	2	5.9°	65000	Yes	0,24
6597155	VXF018Z02A18XP07L180	18	9	18	180	25	0,9	2	5.4°	61000	Yes	0,31
6597156	VXF020Z03A20XP07L190	20	11	20	190	32	0,9	3	3.4°	57000	Yes	0,41
6597157	VXF025Z04A25XP07L200	25	16	25	200	40	0,9	4	2.2°	49000	Yes	0,69

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-07 • XPPT-MM



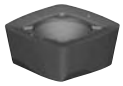


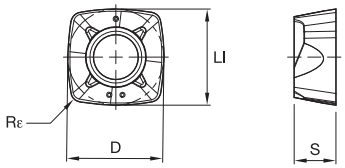
● first choice
○ alternate choice

P	●	●	●	
M	●	●	●	
K	○			●
N			○	
S	●	○	●	
H	○			●

ISO catalogue number	cutting edges	Ll	S	D	Rε	WP25PM	WP40PM	WS40PM	WU10PM
XPPT070308ERMM	4	7,30	3,17	7,30	0,80	6595819	–	6595820	–

VXF-07 • XPPW-MH





● first choice
○ alternate choice

P	●	●	●	
M	●	●	●	
K	○			●
N			○	
S	●	○	●	
H	○			●

ISO catalogue number	cutting edges	Ll	S	D	Rε	WP25PM	WP40PM	WS40PM	WU10PM
XPPW070310SRMH	4	7,30	3,17	7,30	1,00	–	6595770	–	6595769

VXF-07 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XPPT-MM	WP25PM	**XPPT-MM**	**WS40PM**	XPPW-MH	WP40PM
P3–P4	XPPT-MM	WP25PM	**XPPT-MM**	**WS40PM**	XPPW-MH	WP40PM
P5–P6	XPPT-MM	WP25PM	**XPPT-MM**	**WS40PM**	XPPW-MH	WP40PM
M1–M2	XPPT-MM	WS40PM	**XPPT-MM**	**WS40PM**	XPPW-MH	WP40PM
M3	XPPT-MM	WS40PM	**XPPT-MM**	**WS40PM**	XPPW-MH	WP40PM
K1–K2	XPPW-MH	WU10PM	**XPPW-MH**	**WU10PM**	XPPW-MH	WU10PM
K3	XPPW-MH	WU10PM	**XPPW-MH**	**WU10PM**	XPPW-MH	WU10PM
S1–S2	XPPT-MM	WP25PM	**XPPT-MM**	**WS40PM**	–	–
S3	XPPT-MM	WS40PM	**XPPT-MM**	**WS40PM**	–	–
S4	XPPT-MM	WS40PM	**XPPT-MM**	**WS40PM**	–	–
H1	XPPW-MH	WU10PM	**XPPW-MH**	**WU10PM**	–	–

VXF-07 • Recommended Starting Speeds [m/min]

Material Group		WP25PM			WP40PM			WS40PM			WU10PM		
P	1	395	**340**	325	355	**310**	295	–	**–**	–	–	**–**	–
	2	330	**290**	240	300	**260**	215	–	**–**	–	–	**–**	–
	3	305	**260**	210	275	**235**	190	–	**–**	–	–	**–**	–
	4	270	**220**	180	245	**205**	160	–	**–**	–	–	**–**	–
	5	220	**205**	180	205	**185**	160	205	**175**	145	–	**–**	–
	6	200	**150**	120	180	**140**	110	180	**130**	95	–	**–**	–
M	1	245	**215**	200	235	**205**	185	250	**205**	170	–	**–**	–
	2	220	**190**	155	210	**180**	150	215	**175**	145	–	**–**	–
	3	170	**145**	115	155	**140**	110	175	**130**	100	–	**–**	–
K	1	275	**245**	220	–	**–**	–	–	**–**	–	355	**320**	290
	2	215	**190**	180	–	**–**	–	–	**–**	–	275	**245**	230
	3	180	**160**	145	–	**–**	–	–	**–**	–	235	**210**	190
S	1	50	**40**	30	50	**40**	35	50	**40**	30	–	**–**	–
	2	50	**40**	30	50	**40**	35	50	**40**	30	–	**–**	–
	3	60	**50**	30	60	**50**	35	60	**50**	30	–	**–**	–
	4	85	**60**	40	80	**60**	40	70	**60**	35	–	**–**	–
H	1	145	**110**	85	–	**–**	–	–	**–**	–	190	**155**	110

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VXF-07 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 0,60 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,46	**1,32**	2,43	0,32	**0,89**	1,53	0,24	**0,65**	1,09	0,21	**0,56**	0,94	0,19	**0,52**	0,85	.E..MM
.S..MH	0,84	**1,84**	3,12	0,59	**1,21**	1,85	0,43	**0,87**	1,30	0,38	**0,75**	1,12	0,34	**0,69**	1,02	.S..MH

At 0,70 Axial Depth of Cut (Ap1)

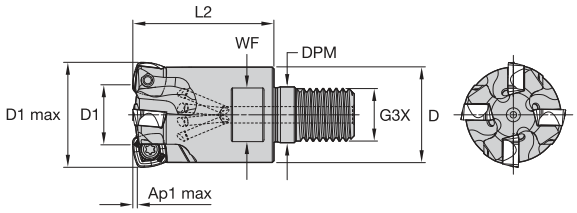
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,42	**1,21**	2,20	0,30	**0,83**	1,41	0,22	**0,60**	1,01	0,19	**0,52**	0,87	0,18	**0,48**	0,79	.E..MM
.S..MH	0,78	**1,68**	2,79	0,55	**1,12**	1,71	0,40	**0,81**	1,21	0,35	**0,70**	1,04	0,32	**0,64**	0,94	.S..MH

At 0,90 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,37	**1,06**	1,89	0,27	**0,73**	1,24	0,20	**0,53**	0,89	0,17	**0,46**	0,77	0,16	**0,42**	0,70	.E..MM
.S..MH	0,68	**1,46**	2,35	0,48	**0,98**	1,49	0,36	**0,71**	1,07	0,31	**0,62**	0,92	0,28	**0,56**	0,84	.S..MH

NOTE: Use "Light Machining" values as starting feed rate.

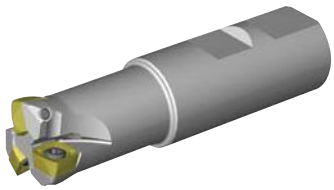
VXF-09 • Screw-On End Mills • Metric

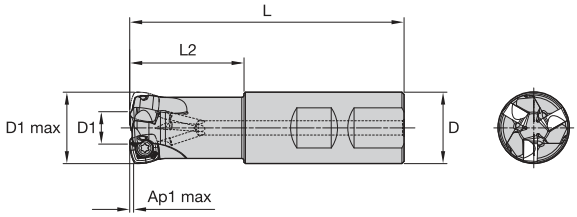


order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597731	VXF025Z03M12XD09	25	11	21	12,5	M12	35	9	1,5	3	2.8°	48500	Yes	0,09
6597732	VXF032Z03M16XD09	32	18	29	17,0	M16	43	10	1,5	3	1.5°	40500	Yes	0,20
6597733	VXF032Z04M16XD09	32	18	29	17,0	M16	43	10	1,5	4	1.5°	40500	Yes	0,20
6597734	VXF035Z04M16XD09	35	21	29	17,0	M16	43	10	1,5	4	1.3°	37500	Yes	0,21
6597735	VXF042Z05M16XD09	42	28	29	17,0	M16	43	10	1,5	5	1.0°	34000	Yes	0,25

NOTE: Please order wrench separately.

VXF-09 • Weldon® End Mills • Metric





order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597736	VXF025Z03B25XD09	25	11	25	96	40	1,5	3	2.8°	48500	Yes	0,28
6597737	VXF032Z04B25XD09	32	18	25	96	40	1,5	4	1.5°	40500	Yes	0,36

NOTE: Please order wrench separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

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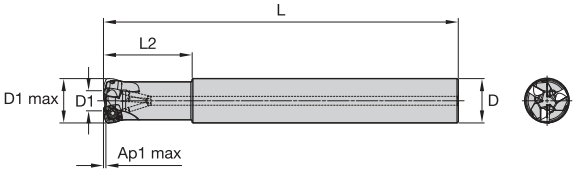
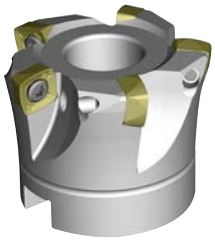
VXF-09 • Cylindrical End Mills • Metric

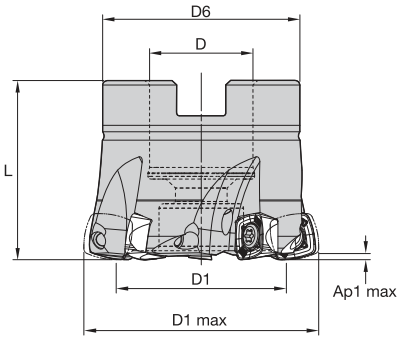


order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597740	VXF025Z02A25XD09L200	25	11	25	200	50	1,5	2	2.8°	48500	Yes	0,67
6597742	VXF025Z03A25XD09L200	25	11	25	200	50	1,5	3	2.8°	48500	Yes	0,67
6597743	VXF032Z03A25XD09L200	32	18	25	200	40	1,5	3	1.5°	40500	Yes	0,75
6597744	VXF032Z04A25XD09L200	32	18	25	200	40	1,5	4	1.5°	40500	Yes	0,75

NOTE: Please order wrench separately.

VXF-09 • Shell Mills • Metric





order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597746	VXF040Z04S16XD09	40	26	16	37	32	1,5	4	.8°	34500	Yes	0,15
6597747	VXF040Z05S16XD09	40	26	16	37	32	1,5	5	.8°	34500	Yes	0,14
6597748	VXF042Z05S16XD09	42	28	16	37	32	1,5	5	.8°	34000	Yes	0,16
6597750	VXF050Z07S22XD09	50	34	22	42	40	1,5	7	.7°	30000	Yes	0,28
6597749	VXF050Z05S22XD09	50	36	22	42	40	1,5	5	.7°	30000	Yes	0,29
6597751	VXF052Z06S22XD09	52	38	22	42	40	1,5	6	.7°	29500	Yes	0,30
6597755	VXF063Z06S22XD09	63	49	22	42	40	1,5	6	.5°	26000	Yes	0,40

NOTE: Please order wrench separately.

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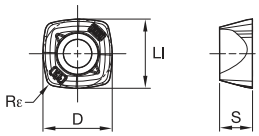
VXF-09 • XDPT-MM

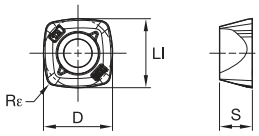


● first choice
○ alternate choice

P		●	●	●
M		●	●	●
K		○		
N				○
S		●	○	●
H		○		

ISO catalogue number	cutting edges	LI	S	D	Rε	WP25PM	WP40PM	WS40PM
XDPT090412ERMM	4	10,00	4,76	10,00	1,20	6596471	-	6596472

VXF-09 • XDPT-MH



● first choice
○ alternate choice

P		●	●	●
M		●	●	●
K		○		
N				○
S		●	○	●
H		○		

ISO catalogue number	cutting edges	LI	S	D	Rε	WP25PM	WP40PM	WS40PM
XDPT090412SRMH	4	10,00	4,76	10,00	1,20	-	6596822	-

VXF-09 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
P3–P4	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
P5–P6	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
M1–M2	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
M3	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
S1–S2	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
S3	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
S4	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM

VXF-09 • Recommended Starting Speeds [m/min]

Material Group		WP25PM			WP40PM			WS40PM		
P	1	395	**340**	325	355	**310**	295	–	–	–
	2	330	**290**	240	300	**260**	215	–	–	–
	3	305	**260**	210	275	**235**	190	–	–	–
	4	270	**220**	180	245	**205**	160	–	–	–
	5	220	**205**	180	205	**185**	160	205	**175**	145
	6	200	**150**	120	180	**140**	110	180	**130**	95
M	1	245	**215**	200	235	**205**	185	250	**205**	170
	2	220	**190**	155	210	**180**	150	215	**175**	145
	3	170	**145**	115	155	**140**	110	175	**130**	100
S	1	50	**40**	30	50	**40**	35	50	**40**	30
	2	50	**40**	30	50	**40**	35	50	**40**	30
	3	60	**50**	30	60	**50**	35	60	**50**	30
	4	85	**60**	40	80	**60**	40	70	**60**	35

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VXF-09 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 0,90 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,48	**1,42**	2,20	0,35	**1,00**	1,52	0,26	**0,74**	1,11	0,23	**0,64**	0,96	0,21	**0,59**	0,88	.E..MM
.S..MH	0,70	**1,58**	2,65	0,50	**1,11**	1,80	0,37	**0,82**	1,31	0,33	**0,71**	1,14	0,30	**0,65**	1,04	.S..MH

At 1,10 Axial Depth of Cut (Ap1)

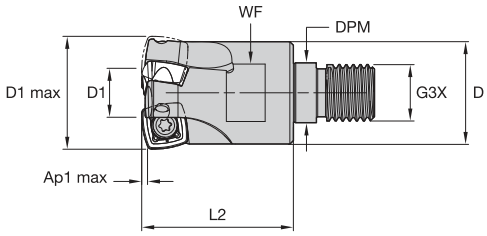
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,44	**1,28**	1,98	0,32	**0,90**	1,37	0,24	**0,67**	1,01	0,21	**0,58**	0,87	0,19	**0,53**	0,80	.E..MM
.S..MH	0,64	**1,42**	2,37	0,45	**1,00**	1,63	0,34	**0,74**	1,19	0,30	**0,64**	1,03	0,27	**0,59**	0,94	.S..MH

At 1,50 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,64	**1,42**	2,37	0,45	**1,00**	1,63	0,34	**0,74**	1,19	0,30	**0,64**	1,03	0,27	**0,59**	0,94	.E..MM
.S..MH	0,55	**1,22**	2,01	0,39	**0,86**	1,39	0,29	**0,64**	1,02	0,25	**0,55**	0,89	0,23	**0,51**	0,81	.S..MH

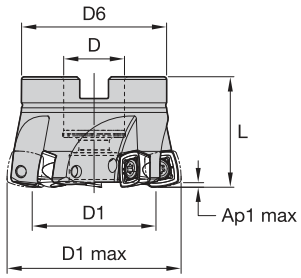
NOTE: Use "Light Machining" values as starting feed rate.

VXF-12 • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596723	VXF032Z03M16XD12	32	14	29	17,0	M16	43	24	2,5	3	1.8°	31500	Yes	0,19

VXF-12 • Shell Mills • Metric

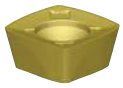


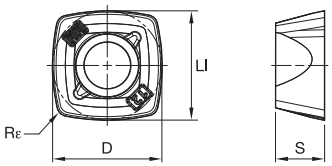
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596725	VXF040Z04S22XD12	40	22	22	38	40	2,5	4	1.4°	26500	Yes	0,19
6596727	VXF042Z04S22XD12	42	24	22	38	40	2,5	4	1.3°	25500	Yes	0,21
6596728	VXF050Z04S22XD12	50	32	22	48	40	2,5	4	.9°	22500	Yes	0,31
6596729	VXF052Z05S22XD12	52	34	22	48	40	2,5	5	.8°	22000	Yes	0,32
6596730	VXF063Z05S22XD12	63	45	22	53	40	2,5	5	.6°	19500	Yes	0,47
6596732	VXF066Z06S27XD12	66	48	27	53	45	2,5	6	.5°	19000	Yes	0,55
6596733	VXF080Z06S27XD12	80	62	27	55	50	2,5	6	.5°	17000	Yes	0,87
6596734	VXF100Z07S32XD12	100	82	32	65	50	2,5	7	.3°	15000	Yes	1,34

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-12 • XDPT-MM



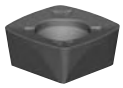


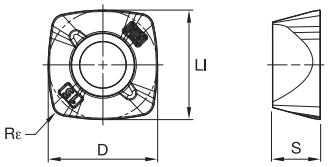
● first choice
○ alternate choice

P		●	●	●
M		●	●	●
K		○		
N				○
S		●	○	●
H		○		

ISO catalogue number	cutting edges	LI	S	D	Rε	WP25PM	WP40PM	WS40PM
XDPT120512ERMM	4	12,70	5,56	12,70	1,20	6596438	-	6596439

VXF-12 • XDPT-MH





● first choice
○ alternate choice

P		●	●	●
M		●	●	●
K		○		
N				○
S		●	○	●
H		○		

ISO catalogue number	cutting edges	LI	S	D	Rε	WP25PM	WP40PM	WS40PM
XDPT120515SRMH	4	12,70	5,56	12,70	1,50	-	6596440	-

VXF-12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
P3–P4	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
P5–P6	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
M1–M2	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
M3	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
S1–S2	XDPT-MM	WP25PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
S3	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM
S4	XDPT-MM	WS40PM	**XDPT-MM**	**WS40PM**	XDPT-MH	WP40PM

VXF-12 • Recommended Starting Speeds [m/min]

Material Group		WP25PM			WP40PM			WS40PM		
P	1	395	**340**	325	355	**310**	295	–	–	–
	2	330	**290**	240	300	**260**	215	–	–	–
	3	305	**260**	210	275	**235**	190	–	–	–
	4	270	**220**	180	245	**205**	160	–	–	–
	5	220	**205**	180	205	**185**	160	205	**175**	145
	6	200	**150**	120	180	**140**	110	180	**130**	95
M	1	245	**215**	200	235	**205**	185	250	**205**	170
	2	220	**190**	155	210	**180**	150	215	**175**	145
	3	170	**145**	115	155	**140**	110	175	**130**	100
S	1	50	**40**	30	50	**40**	35	50	**40**	30
	2	50	**40**	30	50	**40**	35	50	**40**	30
	3	60	**50**	30	60	**50**	35	60	**50**	30
	4	85	**60**	40	80	**60**	40	70	**60**	35

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VXF-12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 1,30 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,49	**1,59**	2,52	0,35	**1,13**	1,78	0,26	**0,84**	1,31	0,23	**0,73**	1,14	0,21	**0,67**	1,04	.E..MM
.S..MH	0,70	**1,80**	2,76	0,51	**1,28**	1,94	0,38	**0,95**	1,44	0,33	**0,83**	1,25	0,30	**0,76**	1,14	.S..MH

At 1,70 Axial Depth of Cut (Ap1)

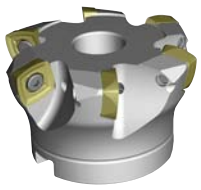
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,43	**1,39**	2,20	0,31	**0,99**	1,56	0,23	**0,74**	1,15	0,20	**0,64**	1,00	0,19	**0,59**	0,92	.E..MM
.S..MH	0,62	**1,57**	2,41	0,45	**1,12**	1,70	0,33	**0,84**	1,26	0,29	**0,73**	1,10	0,27	**0,67**	1,00	.S..MH

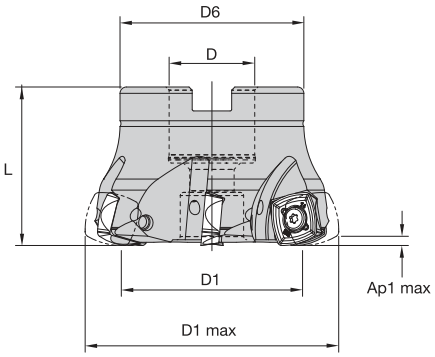
At 2,50 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,36	**1,15**	1,81	0,26	**0,83**	1,29	0,19	**0,62**	0,96	0,17	**0,54**	0,83	0,15	**0,49**	0,76	.E..MM
.S..MH	0,51	**1,30**	1,99	0,37	**0,93**	1,41	0,28	**0,70**	1,05	0,24	**0,61**	0,91	0,22	**0,55**	0,83	.S..MH

NOTE: Use "Light Machining" values as starting feed rate.

VXF-16 • Shell Mills • Metric



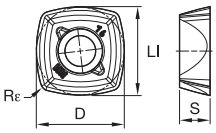


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597776	VXF050Z04S22XE16	50	27	22	45	45	3,5	4	1.4°	25100	Yes	0,29
6597777	VXF063Z05S22XE16	63	40	22	47	40	3,5	5	.9°	21400	Yes	0,36
6597778	VXF080Z06S27XE16	80	57	27	58	50	3,5	6	.6°	18300	Yes	0,85
6597779	VXF100Z08S32XE16	100	77	32	68	50	3,5	8	.4°	16000	Yes	1,29
6597780	VXF125Z10S40XE16	125	102	40	84	63	3,5	10	.3°	14000	Yes	2,73

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-16 • XEPT-MM



● first choice
○ alternate choice

P	●	●
M	●	●
K	○	
N		○
S	●	●
H	○	

ISO catalogue number	cutting edges	LI	S	D	Rε	WP25PM	WS40PM
XEPT160516ERMM	4	16,00	5,56	16,00	1,60	6596823	6596824

VXF-16 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	XEPT-MM	WP25PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
P3–P4	XEPT-MM	WP25PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
P5–P6	XEPT-MM	WP25PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
M1–M2	XEPT-MM	WS40PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
M3	XEPT-MM	WS40PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
S1–S2	XEPT-MM	WP25PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
S3	XEPT-MM	WS40PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM
S4	XEPT-MM	WS40PM	**XEPT-MM**	**WS40PM**	XEPT-MM	WS40PM

VXF-16 • Recommended Starting Speeds [m/min]

Material Group		WP25PM			WS40PM		
P	1	395	**340**	325	–	**–**	–
	2	330	**290**	240	–	**–**	–
	3	305	**260**	210	–	**–**	–
	4	270	**220**	180	–	**–**	–
	5	220	**205**	180	205	**175**	145
	6	200	**150**	120	180	**130**	95
M	1	245	**215**	200	250	**205**	170
	2	220	**190**	155	215	**175**	145
	3	170	**145**	115	175	**130**	100
S	1	50	**40**	30	50	**40**	30
	2	50	**40**	30	50	**40**	30
	3	60	**50**	30	60	**50**	30
	4	85	**60**	40	70	**60**	35

*NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.*
**Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.*
**Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.*

VXF-16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 2,00 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,40	**1,28**	2,18	0,29	**0,92**	1,54	0,21	**0,68**	1,14	0,19	**0,60**	0,99	0,17	**0,55**	0,91	.E..MM

At 2,50 Axial Depth of Cut (Ap1)

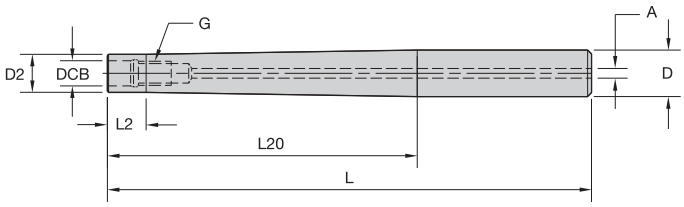
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,36	**1,15**	1,95	0,26	**0,83**	1,38	0,19	**0,62**	1,03	0,17	**0,54**	0,89	0,15	**0,49**	0,82	.E..MM

At 3,50 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,30	**0,98**	1,66	0,22	**0,71**	1,18	0,17	**0,53**	0,88	0,14	**0,46**	0,76	0,13	**0,42**	0,70	.E..MM

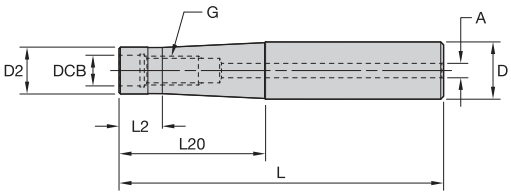
NOTE: Use "Light Machining" values as starting feed rate.

Cylindrical Shank Extensions for Modular Heads • Screw-On Adapters • Metric



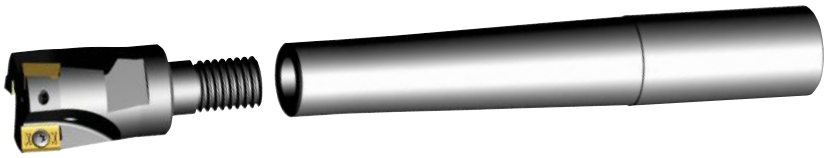
order number	catalogue number	DCB	G	D	D2	A	L	L2	L20
4160427	SS120STCHM06085M	6,5	M6	12	10	2,5	85	10	40
4160428	SS120STCHM06105M	6,5	M6	12	10	2,5	105	10	60
4160430	SS120STCHM06125M	6,5	M6	12	10	2,5	125	10	80
4160431	SS160STCHM08088M	8,5	M8	16	13	3,0	88	10	40
4160432	SS160STCHM08108M	8,5	M8	16	13	3,0	108	10	60
4160473	SS160STCHM08128M	8,5	M8	16	13	3,0	128	10	80
4160474	SS160STCHM08148M	8,5	M8	16	13	3,0	148	10	100
4160475	SS160STCHM08168M	8,5	M8	16	13	3,0	168	10	120
4160476	SS200STCHM10090M	10,5	M10	20	18	3,5	90	10	40
4160477	SS200STCHM10110M	10,5	M10	20	18	3,5	110	10	60
4160478	SS200STCHM10130M	10,5	M10	20	18	3,5	130	10	80
4160479	SS200STCHM10150M	10,5	M10	20	18	3,5	150	10	100
4160480	SS200STCHM10170M	10,5	M10	20	18	3,5	170	10	130

Cylindrical Shank Extensions for Modular Heads • Metric

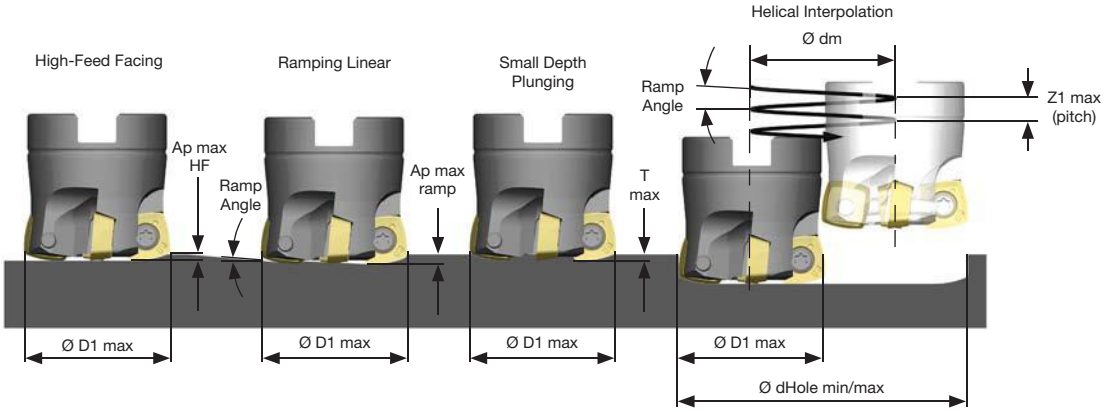


order number	catalogue number	DCB	G	D	D2	A	L	L2	L20
5672985	M-21-M12-CA25-131	12,50	M12	25	21	5	131	12	75
5672468	M-21-M12-CA25-156	12,50	M12	25	21	5	156	12	100
5672986	M-21-M12-CA25-181	12,50	M12	25	21	5	181	12	125
5672831	M-21-M12-CA25-206	12,50	M12	25	21	5	206	12	150
5672987	M-21-M12-CA25-231	12,50	M12	25	21	5	231	12	175
5672832	M-29-M16-CA32-160	17,00	M16	32	29	5	160	16	100
5672988	M-29-M16-CA32-210	17,00	M16	32	29	5	210	16	150
5673783	M-29-M16-CA32-260	17,00	M16	32	29	5	260	16	200
5672989	M-29-M16-CA32-310	17,00	M16	32	29	5	310	16	250

NOTE: Cylindrical shank extensions can be used with all modular heads found in several product family series.



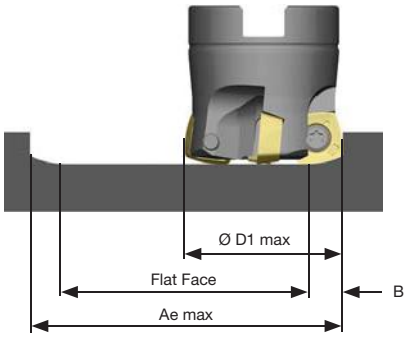
Best Practices



series	D1 max	High-feed Facing: Ap max HF	Ramping Linear: Ramp Angle max	Ramping Linear: Ap max Ramp	Helical Interpolation: Ramp Angle max	Helical Interpolation: d Hole min	Helical Interpolation: d Hole max	Helical Interpolation: Z1 max Helical	Small Depth Plunging: T max
VXF-07	16	0,60	5,9	0,60	5,9	22,0	30,0	0,60	0,45
	18	0,60	5,4	0,60	5,4	24,0	34,0	0,60	0,45
	20	0,60	3,4	0,60	3,4	30,0	38,0	0,60	0,30
	25	0,60	2,2	0,60	2,2	40,0	48,0	0,60	0,30
	32	0,60	1,4	0,60	1,4	54,0	62,0	0,60	0,30
	40	0,60	1,0	0,60	1,0	70,0	78,0	0,60	0,30
	50	0,60	0,7	0,60	0,7	90,0	98,0	0,60	0,30
VXF-09	25	0.90	2.8	1.00	2.8	34.0	48.0	1.00	0.65
	32	0.90	1.5	1.00	1.5	48.0	62.0	1.00	0.65
	35	0.90	1.3	1.00	1.3	54.0	68.0	1.00	0.65
	40	0.90	0.8	1.00	0.8	64.0	78.0	1.00	0.65
	42	0.90	0.8	1.00	0.8	68.0	82.0	1.00	0.65
	50	0.90	0.7	1.00	0.7	84.0	98.0	1.00	0.65
	52	0.90	0.7	1.00	0.7	88.0	102.0	1.00	0.65
	63	0.90	0.5	1.00	0.7	106.0	124.0	1.00	0.65
VXF-12	32	1,30	1,8	1,80	1,8	42,0	62,0	1,80	0,80
	40	1,30	1,4	1,80	1,4	58,0	78,0	1,80	0,80
	42	1,30	1,3	1,80	1,3	62,0	82,0	1,80	0,80
	50	1,30	0,9	1,80	0,9	78,0	98,0	1,80	0,80
	52	1,30	0,8	1,80	0,8	82,0	102,0	1,80	0,80
	63	1,30	0,6	1,80	0,6	104,0	124,0	1,80	0,80
	66	1,30	0,5	1,80	0,5	110,0	130,0	1,80	0,80
	80	1,30	0,5	1,80	0,5	138,0	158,0	1,80	0,80
	100	1,30	0,3	1,80	0,3	178,0	198,0	1,80	0,80
VXF-16	50	2.00	1.4	2.50	1.4	70.0	98.0	2.50	0.70
	63	2.00	0.9	2.50	0.9	96.0	124.0	2.50	0.70
	80	2.00	0.6	2.50	0.6	130.0	158.0	2.50	0.70
	100	2.00	0.4	2.50	0.4	170.0	198.0	2.50	0.70
	125	2.00	0.3	2.50	0.3	220.0	248.0	2.50	0.70

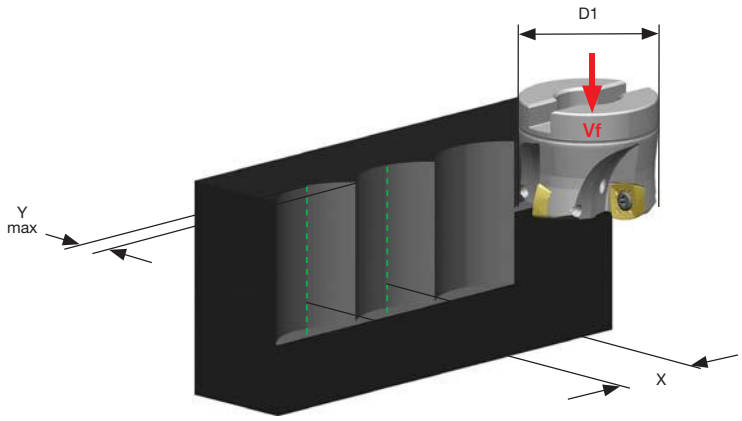
Ødm = ØHole–ØD1 max
Z1 = Ødm x 3,14 x tan ramp angle. Z1 ≤ Z1 max and ≤ ramp angle max
Ramp angle = arc tan x ((Z1)/Ødm x 3,14))

series	D1 max	X
VXF-07	16–50	4,20
VXF-09	25–63	6.80
VXF-12	32–100	9,10
VXF-16	50–125	11.40



Ae max ≤ 2 x ØD1 max–2 x B
Flat Face = Ae max–2 x B

Z-Axis Plunge Milling



VXF-07

D1 max	Y max	X
16	3	12,49
18	3	13,41
20	3	14,28
25	3	16,24
32	3	18,65
40	3	21,07
50	3	23,74

VXF-09

D1 max	Y max	X
25	6	21,35
32	6	24,98
35	6	26,38
40	6	28,56
42	6	29,39
50	6	32,49
52	6	33,22
63	6	36,98

VXF-12

D1 max	Y max	X
32	9	28,77
40	9	33,40
42	9	34,46
50	9	38,41
52	9	39,34
63	9	44,09
66	9	45,29
80	9	50,55
100	9	57,23

VXF-16

D1 max	Y max	X
50	13	43,86
63	13	50,99
80	13	59,02
100	13	67,26
125	13	76,31

Feed Rate Guide • Z-Axis Plunge Milling • fz (mm/tooth)

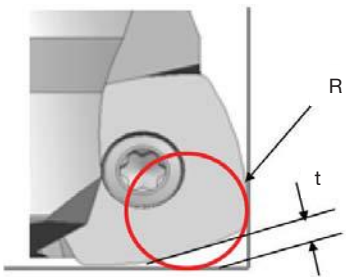
Light Machining	General Purpose	Heavy Machining

	Insert Geometry	Recommended Starting Feed per Tooth (Fz)			Insert Geometry	Y max
VXF-07	.E..MM	0,06	**0,15**	–	.E..MM	3,0
	.S..MH	0,10	**0,20**	–	.S..MH	3,0
VXF-09	.E..MM	0,07	**0,20**	0,30	.E..MM	6,0
	.S..MH	0,10	**0,22**	0.35	.S..MH	6,0
VXF-12	.E..MM	0,07	**0,20**	0,30	.E..MM	9,0
	.S..MH	0,10	**0,25**	0,35	.S..MH	9,0
VXF-16	.E..MM	0,07	**0.23**	0.38	.E..MM	13,0

CAM Programming

Programming Data

insert size	insert radius	R (to be programmed)	t
07	0,8	1,4	0,4
	1,0	1,5	0,4
09	0,8	2,0	0,72
	1,2	2,3	0,67
12	1,2	2,7	0,97
	1,5	2,8	0,95
16	1,2	4,2	1,46

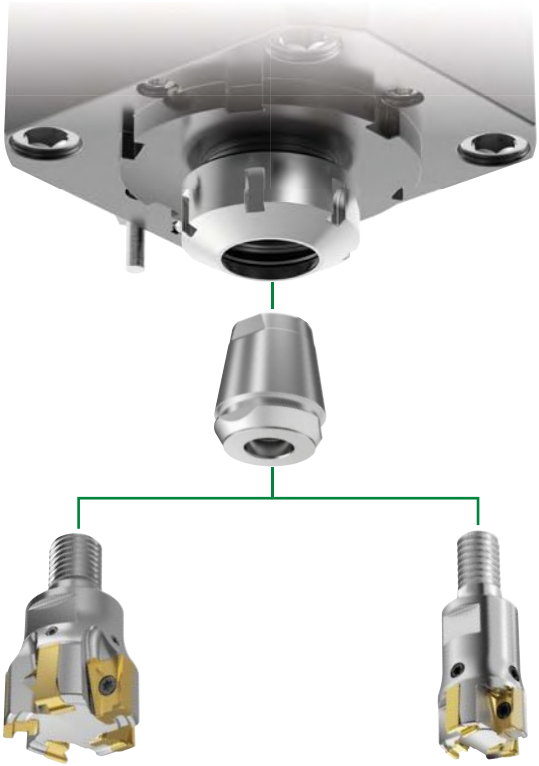


Solid ER Collets

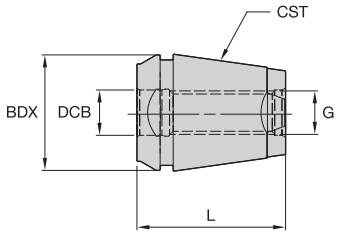
Threaded solid ER collets turn CNC lathe machines into multitasking machines by providing access of any small diameter screw-on milling cutter to ER driven units.

These new solid ER collets increase machine utilization through modular flexibility.

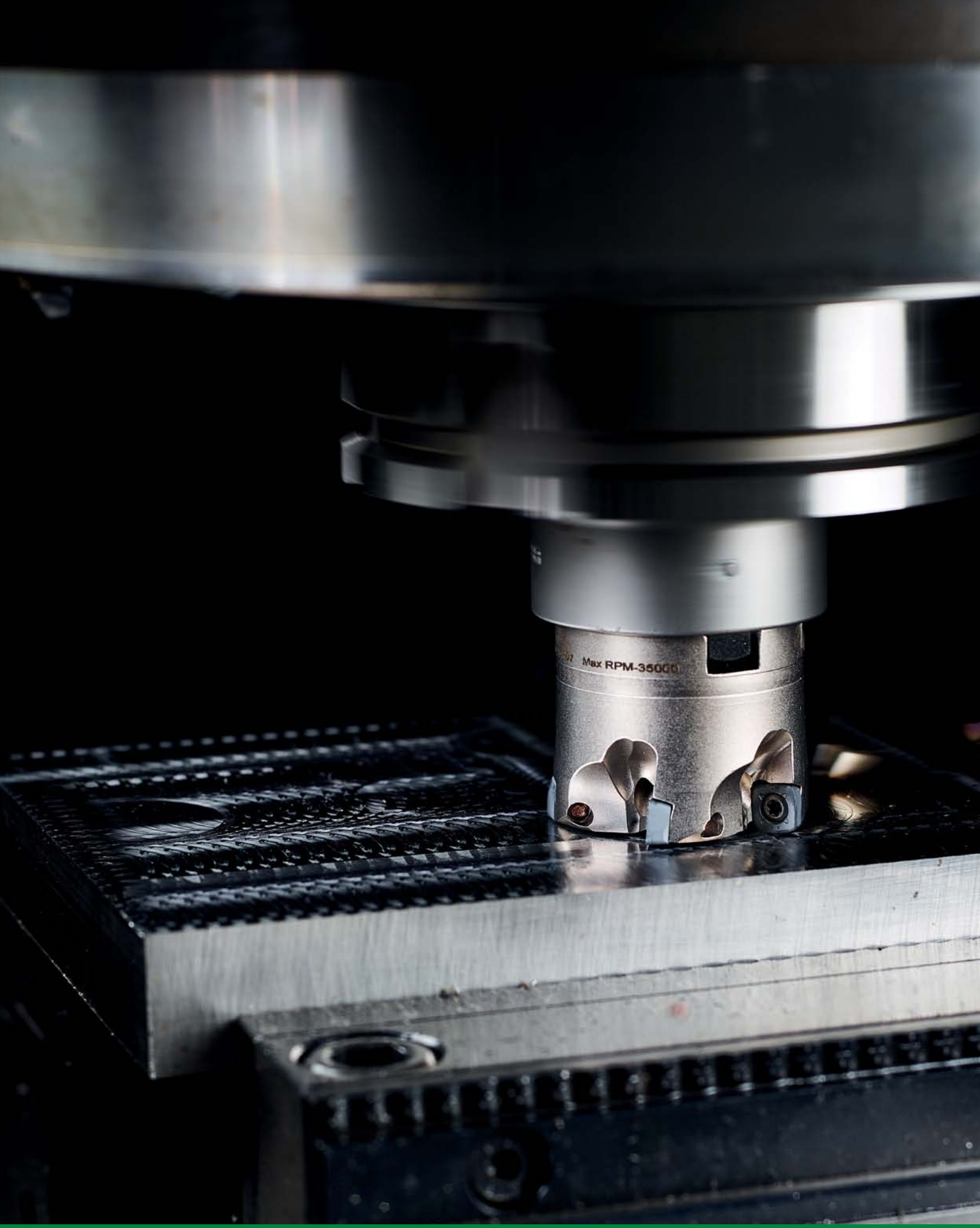
The short projection from the face of the collet nut provides rigid toolholding and a smaller required machine envelope.



ERICKSON™



order number	catalogue number	CST	collet capacity min mm	G	BDX	L
6587968	ER25STM08	ER25	9	M8	26	35
6587969	ER25STM10	ER25	11	M10	26	35
6587970	ER25STM12	ER25	13	M12	26	35
6588001	ER32STM08	ER32	9	M8	33	41
6588002	ER32STM10	ER32	11	M10	33	41
6588003	ER32STM12	ER32	13	M12	33	41
6588004	ER32STM16	ER32	17	M16	33	41
6588005	ER40STM08	ER40	9	M8	41	47
6588006	ER40STM10	ER40	11	M10	41	47
6588007	ER40STM12	ER40	13	M12	41	47
6588008	ER40STM16	ER40	17	M16	41	47



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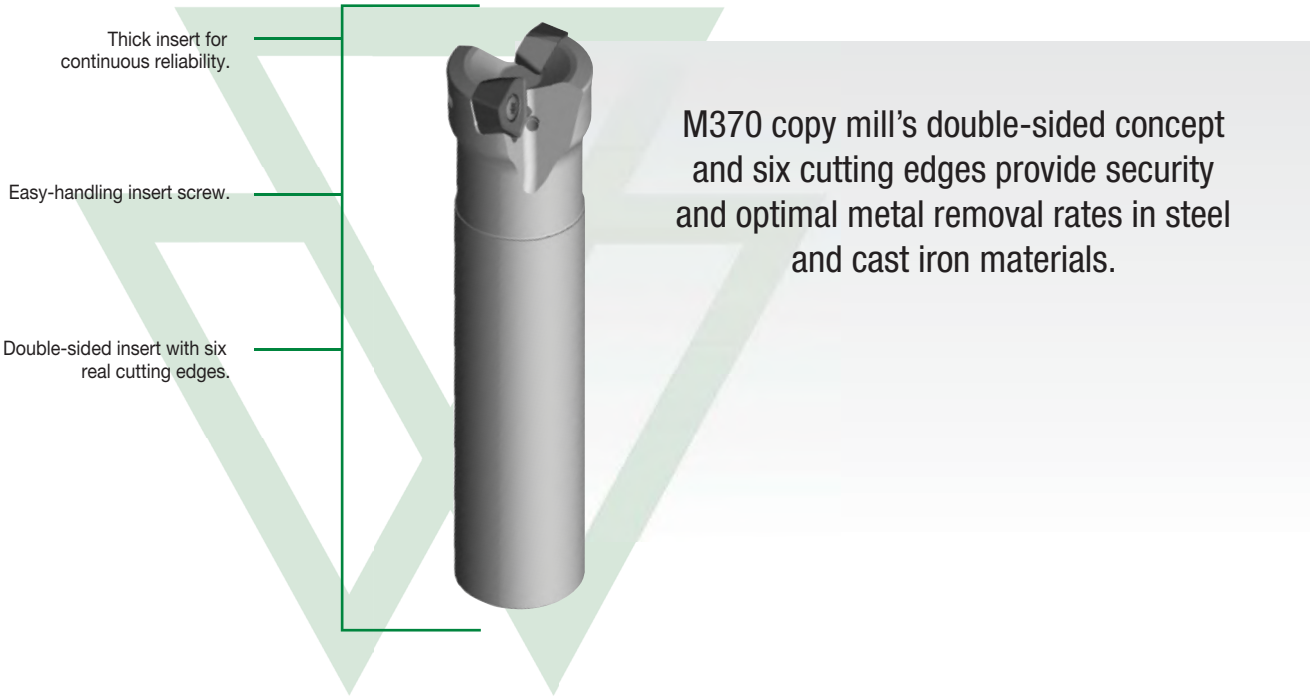
WIDIA™

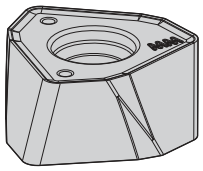
M370™ Series

M370 IC08, M370 IC12 Copy Mills

The M370 Series is a six-edged copy mill designed for high feed rate productivity in steel and cast iron materials.



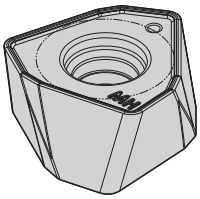
iC08 and iC12 inserts offered in THREE Geometries



-MM

P M S

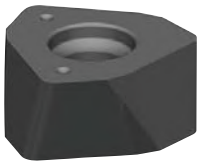
Designed for lower cutting forces. First choice for steel, stainless steel, and high-temp alloys.



-MH

P K

This insert has a strong cutting edge, making it a first choice for hard machining applications up to 48 HRC.



-MR

P K

Designed for heavy-duty steel and cast iron applications.

HIGH-FEED ROUGHING

PRODUCT

SERIES

M370™

DIAMETER RANGE

25–125mm

SHANK TYPES

Screw-On End Mills
Weldon® End Mills
Shell Mills

INDUSTRY

GENERAL ENGINEERING

APPLICATIONS

3D PROFILING

SLOTTING: SIDE MILLING

SLOTTING: SQUARE END

FACE MILLING

RAMPING BLANK

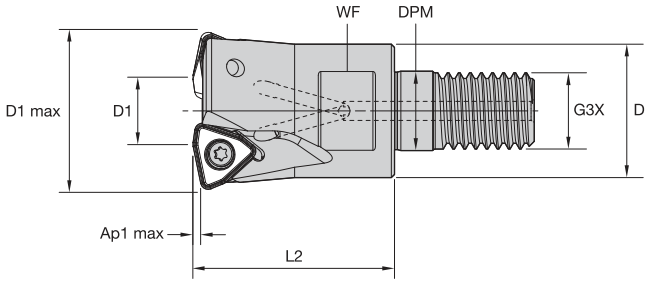
POCKETING

HELICAL MILLING

PLUNGE MILLING

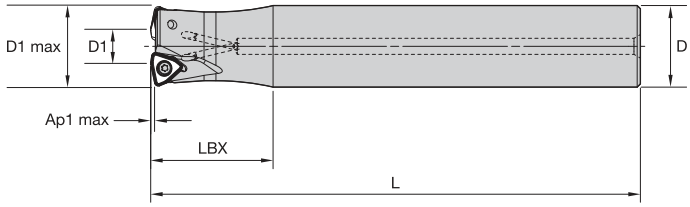
THROUGH COOLANT: RADIAL: INDEXABLE MILLING

M370 • Screw-On End Mills • W008.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4056186	M370D025Z02M12WO08	25	11	21	12,5	M12	35	17	1,3	2	2.1	46000	Yes	0,09
4170918	M370D025Z03M12WO08	25	11	21	12,5	M12	35	17	1,3	3	2.1	46000	Yes	0,09
4056187	M370D032Z04M16WO08	32	18	29	17,0	M16	43	24	1,3	4	1.4	38700	Yes	0,21
4056188	M370D042Z05M16WO08	42	28	29	17,0	M16	43	24	1,3	5	1.0	32500	Yes	0,57

M370 • Cylindrical Shank • W008.. • Metric

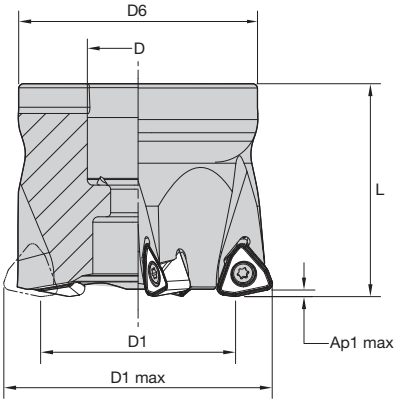


order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4056189	M370D025Z03A25WO08L150	25	11	25	150	40	1,3	3	46000	Yes	0,50
4008281	M370D025Z02A25WO08L200	25	11	25	200	50	1,3	2	46000	Yes	0,68
4170919	M370D025Z03A25WO08L200	25	11	25	200	40	1,3	3	46000	Yes	0,69
4170920	M370D025Z02A25WO08L300	25	11	25	300	40	1,3	2	46000	Yes	1,08
4056190	M370D028Z03A25WO08L200	28	14	25	200	40	1,3	3	42400	Yes	0,70
4056192	M370D032Z04A32WO08L200	32	18	32	200	50	1,3	4	38700	Yes	1,14
4056191	M370D032Z04A32WO08L150	32	18	32	150	40	1,3	4	38700	Yes	0,84
4170921	M370D032Z03A32WO08L300	32	18	32	300	40	1,3	3	38700	Yes	1,77

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

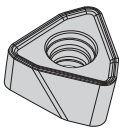
M370 • Shell Mills • WO08... • Metric

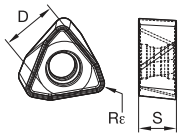


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4056193	M370D040Z04WO08	40	26	16	37	40	1,3	4	33500	Yes	0,19
4170922	M370D040Z05WO08	40	26	16	37	40	1,3	5	33500	Yes	0,19
4008276	M370D050Z05WO08	50	36	22	44	40	1,3	5	29200	Yes	0,29
4171223	M370D050Z06WO08	50	36	22	44	40	1,3	6	29200	Yes	0,29
4171224	M370D052Z06WO08	52	38	22	44	50	1,3	6	28600	Yes	0,40
4056194	M370D052Z05WO08	52	38	22	44	50	1,3	5	28600	Yes	0,41
4056195	M370D063Z06WO08	63	49	22	60	50	1,3	6	25500	Yes	0,74
4008277	M370D066Z06WO08	66	52	27	60	50	1,3	6	24900	Yes	0,77
4171225	M370D080Z07WO08	80	66	27	60	50	1,3	7	24900	Yes	2,36

NOTE: Socket-head cap screw with coolant groove must be ordered separately.

M370 • WOEJ-MH • WO0804..



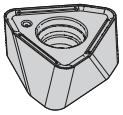


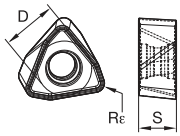
● first choice
○ alternate choice

P		●	●		●	●	●	○	●	●
M		○	●		●	●	●	●	●	●
K		○	○	●	○	○				
N									○	
S			●		●	○	○	●	●	●
H					○			○		

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ080412SRMH	6	7,79	4,75	1,22	4052411	4052410	5427443	5564596	-	5544752	-	6333664	-

M370 • WOEJ-MM • WO0804..





● first choice
○ alternate choice

P		●	●		●	●	●	○	●	●
M		○	●		●	●	●	●	●	●
K		○	○	●	○	○				
N									○	
S			●		●	○	○	●	●	●
H					○			○		

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ080412SRMM	6	7,79	4,70	1,22	4113892	4113915	-	5564597	-	5544753	5520248	6333665	-

M370 • 08 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	...MM	WP40PM	**...MM**	**WP40PM**	...MM	WP40PM
P3–P4	...MM	WP25PM	**...MM**	**WP40PM**	...MH	WP40PM
P5–P6	...MM	WP25PM	**...MH**	**WP25PM**	...MH	WP40PM
M1–M2	...MM	WP25PM	**...MM**	**WS30PM**	...MM	WP40PM
M3	...MM	WP25PM	**...MM**	**WP25PM**	...MM	WP40PM
K1–K2	...MH	WK15CM	**...MH**	**WK15CM**	...MH	WK15CM
K3	...MH	TN6520	**...MH**	**TN6520**	...MH	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	...MM	WP25PM	**...MM**	**WS30PM**	...MM	WP40PM
S3	...MM	WS30PM	**...MM**	**WS30PM**	...MM	WP40PM
S4	...MM	WS30PM	**...MM**	**WP40PM**	...MM	WP40PM
H1	...MH	WP25PM	**–**	**–**	–	–

M370 • 08 • Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			WK15CM			WP25PM			WP35CM		
P	1	410	**320**	280	360	**280**	240	–	**–**	–	395	**340**	325	455	**395**	370
	2	320	**250**	215	250	**190**	170	–	**–**	–	330	**290**	240	280	**255**	230
	3	280	**215**	185	215	**170**	140	–	**–**	–	305	**260**	210	255	**230**	205
	4	235	**170**	145	180	**130**	110	–	**–**	–	270	**220**	180	190	**175**	160
	5	310	**235**	200	240	**180**	150	–	**–**	–	220	**205**	180	260	**230**	210
	6	205	**160**	130	160	**120**	100	–	**–**	–	200	**150**	120	160	**135**	110
M	1	190	**120**	80	130	**80**	60	–	**–**	–	245	**215**	200	205	**185**	155
	2	120	**80**	50	80	**50**	40	–	**–**	–	220	**190**	155	185	**160**	140
	3	125	**80**	55	85	**50**	40	–	**–**	–	170	**145**	115	145	**130**	115
K	1	275	**245**	220	220	**205**	180	505	**460**	410	275	**245**	220	295	**265**	240
	2	215	**190**	180	175	**155**	140	400	**355**	330	215	**190**	180	235	**210**	190
	3	180	**160**	145	155	**145**	125	335	**300**	275	180	**160**	145	195	**175**	160
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	50	**35**	30	–	**–**	–	50	**40**	30	–	**–**	–
	2	–	**–**	–	25	**20**	10	–	**–**	–	50	**40**	30	–	**–**	–
	3	–	**–**	–	70	**40**	30	–	**–**	–	60	**50**	30	–	**–**	–
	4	–	**–**	–	60	**30**	25	–	**–**	–	85	**60**	40	66	**50**	33
H	1	–	**–**	–	–	**–**	–	–	**–**	–	145	**110**	85	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		WP40PM			WS30PM			WS40PM			WU35PM		
P	1	355	**310**	295	–	**–**	–	–	**–**	–	260	**230**	215
	2	300	**260**	215	–	**–**	–	–	**–**	–	220	**190**	160
	3	275	**235**	190	–	**–**	–	–	**–**	–	200	**170**	140
	4	245	**205**	160	–	**–**	–	–	**–**	–	180	**150**	120
	5	205	**185**	160	–	**–**	–	440	**325**	230	150	**135**	120
	6	180	**140**	110	–	**–**	–	375	**260**	165	130	**100**	80
M	1	235	**205**	185	270	**240**	220	850	**605**	375	170	**150**	135
	2	210	**180**	150	245	**215**	175	755	**560**	345	155	**130**	110
	3	155	**140**	110	185	**160**	125	625	**440**	280	115	**100**	80
K	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	50	**40**	35	55	**50**	35	200	**145**	90	35	**30**	25
	2	50	**40**	35	55	**50**	35	180	**130**	85	35	**30**	25
	3	60	**50**	35	65	**55**	35	210	**150**	95	45	**35**	25
	4	80	**60**	40	100	**70**	50	295	**215**	135	60	**45**	30
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

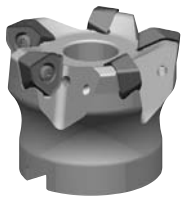
M370 • 08 • Recommended Starting Feeds [mm]

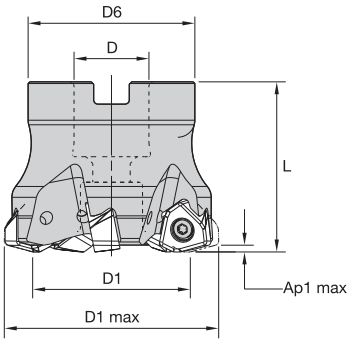
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
..MM	0,90	**1,67**	4,09	0,65	**1,19**	2,83	0,48	**0,88**	2,08	0,42	**0,77**	1,80	0,38	**0,70**	1,64	..MM
..MH	0,90	**2,34**	5,00	0,65	**1,66**	3,41	0,48	**1,23**	2,49	0,42	**1,07**	2,16	0,38	**0,98**	1,97	..MH

NOTE: Use "Light Machining" values as starting feed rate.

M370 • Shell Mills • WO12... • Metric





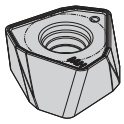
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5338913	M370D50Z04WO12	50,0	33	22	42	50	2,0	4	19530	Yes	0,38
5338914	M370D52Z04WO12	52,0	35	22	49	50	2,0	4	19160	Yes	0,47
5338915	M370D63Z04WO12	63,0	46	22	49	50	2,0	4	17400	Yes	0,57
5338916	M370D63Z05WO12	63,0	46	22	49	50	2,0	5	17400	Yes	0,57
5338917	M370D66Z05WO12	66,0	49	27	60	50	2,0	5	17000	Yes	0,79
5338918	M370D80Z05WO12	80,0	63	27	60	50	2,0	5	15440	Yes	0,94
5338919	M370D80Z06WO12	80,0	63	27	60	50	2,0	6	15440	Yes	0,94
5338920	M370D100Z06WO12	100,0	83	32	78	50	2,0	6	13810	Yes	1,56
5338921	M370D100Z07WO12	100,0	83	32	78	50	2,0	7	13810	Yes	1,57
5338922	M370D125Z07WO12	125,0	108	40	90	63	2,0	7	12350	Yes	2,92
5338923	M370D125Z09WO12	125,0	108	40	90	63	2,0	9	12350	Yes	2,94

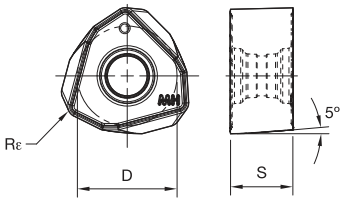
NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M370 • WOEJ-MH • W0.J1207



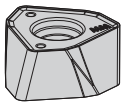


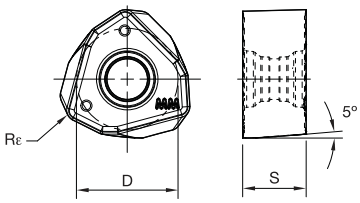
● first choice
○ alternate choice

P		●	●		●	●	●	○	●	●
M		○	●		●	●	●	●	●	●
K		○	○	●	○	○				
N									○	
S			●		●	○	○	●	●	●
H					○			○		

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ120712SRMH	6	12,00	7,30	1,27	-	-	5338860	5338818	5338862	5542347	-	6411157	5338819

M370 • WOEJ-MM • W0.J1207



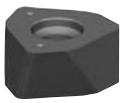


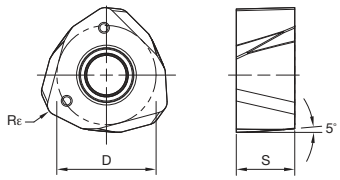
● first choice
○ alternate choice

P		●	●		●	●	●	○	●	●
M		○	●		●	●	●	●	●	●
K		○	○	●	○	○				
N									○	
S			●		●	○	○	●	●	●
H					○			○		

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ120712SRMM	6	12,00	7,30	1,27	-	-	-	5419648	5419791	5542346	5520249	6284471	5419649

M370 • WOEJ-MR • W0.J1207





● first choice
○ alternate choice

P		●	●		●	●	●	○	●	●
M		○	●		●	●	●	●	●	●
K		○	○	●	○	○				
N									○	
S			●		●	○	○	●	●	●
H					○			○		

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ120712SRMR	6	12,00	7,10	1,27	-	-	-	5698343	-	5698342	-	6335211	-

M370 • 12 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	.S..MM	WU35PM	**.S..MM**	**WP40PM**	.S..MM	WP40PM
P3–P4	.S..MM	WP25PM	**.S..MM**	**WP25PM**	.S..MH	WP40PM
P5–P6	.S..MM	WP25PM	**.S..MM**	**WP35CM**	.S..MH	WP35CM
M1–M2	.S..MM	WS30PM	**.S..MM**	**WU35PM**	.S..MM	WP40PM
M3	.S..MM	WP25PM	**.S..MM**	**WP35CM**	.S..MM	WP40PM
K1–K2	.S..MH	WK15CM	**.S..MH**	**WK15CM**	.S..MH	WP20CM
K3	.S..MH	WK15CM	**.S..MH**	**WK15CM**	.S..MH	WP20CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	.S..MM	WS30PM	**.S..MM**	**WU35PM**	.S..MM	WP40PM
S3	.S..MM	WS30PM	**.S..MM**	**WU35PM**	.S..MM	WP40PM
S4	.S..MM	WS30PM	**.S..MM**	**WU35PM**	.S..MM	WP40PM
H1	.S..MH	WP35CM	**.S..MR**	**WP25PM**	–	–

M370 • 12 • Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			WK15CM			WP25PM			WP35CM		
P	1	410	**320**	280	360	**280**	240	–	**–**	–	395	**340**	325	455	**395**	370
	2	320	**250**	215	250	**190**	170	–	**–**	–	330	**290**	240	280	**255**	230
	3	280	**215**	185	215	**170**	140	–	**–**	–	305	**260**	210	255	**230**	205
	4	235	**170**	145	180	**130**	110	–	**–**	–	270	**220**	180	190	**175**	160
	5	310	**235**	200	240	**180**	150	–	**–**	–	220	**205**	180	260	**230**	210
	6	205	**160**	130	160	**120**	100	–	**–**	–	200	**150**	120	160	**135**	110
M	1	190	**120**	80	130	**80**	60	–	**–**	–	245	**215**	200	205	**185**	155
	2	120	**80**	50	80	**50**	40	–	**–**	–	220	**190**	155	185	**160**	140
	3	125	**80**	55	85	**50**	40	–	**–**	–	170	**145**	115	145	**130**	115
K	1	275	**245**	220	220	**205**	180	505	**460**	410	275	**245**	220	295	**265**	240
	2	215	**190**	180	175	**155**	140	400	**355**	330	215	**190**	180	235	**210**	190
	3	180	**160**	145	155	**145**	125	335	**300**	275	180	**160**	145	195	**175**	160
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	50	**35**	30	–	**–**	–	50	**40**	30	–	**–**	–
	2	–	**–**	–	25	**20**	10	–	**–**	–	50	**40**	30	–	**–**	–
	3	–	**–**	–	70	**40**	30	–	**–**	–	60	**50**	30	–	**–**	–
	4	–	**–**	–	60	**30**	25	–	**–**	–	85	**60**	40	66	**50**	33
H	1	–	**–**	–	–	**–**	–	–	**–**	–	145	**110**	85	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		WP40PM			WS30PM			WS40PM			WU35PM		
P	1	355	**310**	295	–	**–**	–	–	**–**	–	260	**230**	215
	2	300	**260**	215	–	**–**	–	–	**–**	–	220	**190**	160
	3	275	**235**	190	–	**–**	–	–	**–**	–	200	**170**	140
	4	245	**205**	160	–	**–**	–	–	**–**	–	180	**150**	120
	5	205	**185**	160	–	**–**	–	440	**325**	230	150	**135**	120
	6	180	**140**	110	–	**–**	–	375	**260**	165	130	**100**	80
M	1	235	**205**	185	270	**240**	220	850	**605**	375	170	**150**	135
	2	210	**180**	150	245	**215**	175	755	**560**	345	155	**130**	110
	3	155	**140**	110	185	**160**	125	625	**440**	280	115	**100**	80
K	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	50	**40**	35	55	**50**	35	200	**145**	90	35	**30**	25
	2	50	**40**	35	55	**50**	35	180	**130**	85	35	**30**	25
	3	60	**50**	35	65	**55**	35	210	**150**	95	45	**35**	25
	4	80	**60**	40	100	**70**	50	295	**215**	135	60	**45**	30
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M370 • 12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

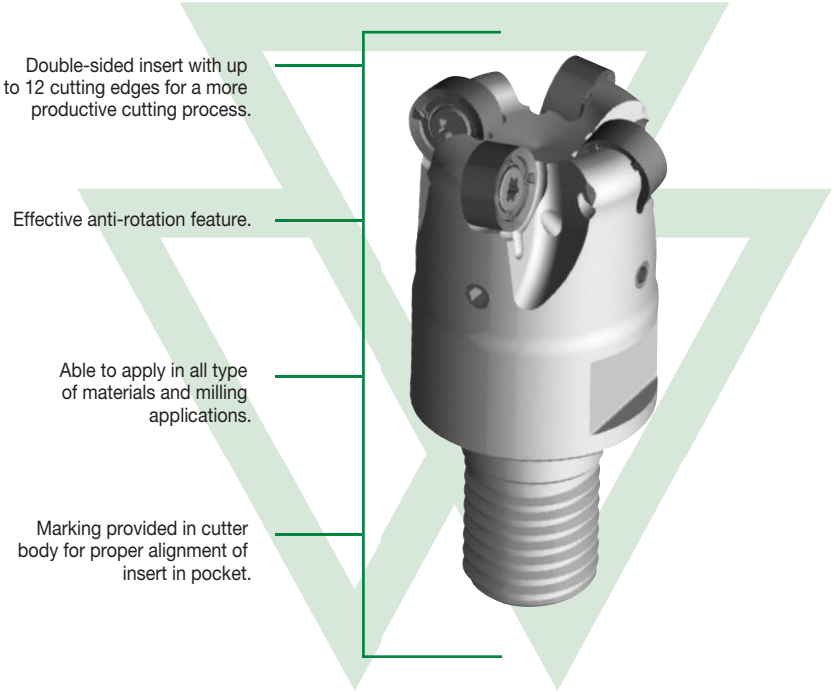
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
..MM	0,90	**1,87**	3,62	0,65	**1,33**	2,52	0,48	**0,99**	1,86	0,42	**0,86**	1,61	0,39	**0,79**	1,47	..MM
..MH	0,90	**2,35**	4,97	0,65	**1,67**	3,40	0,48	**1,23**	2,48	0,42	**1,07**	2,15	0,39	**0,98**	1,96	..MH
..MR	0,90	**2,81**	5,44	0,65	**1,97**	3,69	0,48	**1,46**	2,69	0,42	**1,27**	2,33	0,39	**1,16**	2,13	..MR

NOTE: Use "Light Machining" values as starting feed rate.

M200™ Series

M200 IC10, M200 IC12, M200 IC16 Copy Mills

The M200 copy mill is a double-sided round insert series with an effective anti-rotation feature and 12 cutting edges per insert to tackle pocketing and face milling operations in power generation and general engineering applications.



M200 iC10

10mm iC insert
8 cutting edges

-ALP

N

For non-ferrous materials.

-ML

P M S

First choice for stainless steel and high-temp alloys.

-MM

P M S

First choice for general purpose, especially for steel.

-MH

P K

First choice for heavy machining and cast iron.

M200 iC12

12mm iC insert
12 cutting edges

-ALP

N

For non-ferrous materials.

-ML

P M S

First choice for stainless steel and high-temp alloys.

-MM

P M S

First choice for general purpose, especially for steel.

-MH

P K

First choice for heavy machining and cast iron.

M200 iC16

16mm iC insert
12 cutting edges

-ALP

N

For non-ferrous materials.

-ML

P M S

First choice for stainless steel and high-temp alloys.

-MM

P M S

First choice for general purpose, especially for steel.

-MH

P K

First choice for heavy machining and cast iron.

DOUBLE-SIDED ROUND INSERT COPY MILLING SERIES

PRODUCT

SERIES

M200™

DIAMETER RANGE

50–80mm

SHANK TYPES

Screw-On End Mills
Cylindrical End Mills
Shell Mills

INDUSTRY

ENERGY

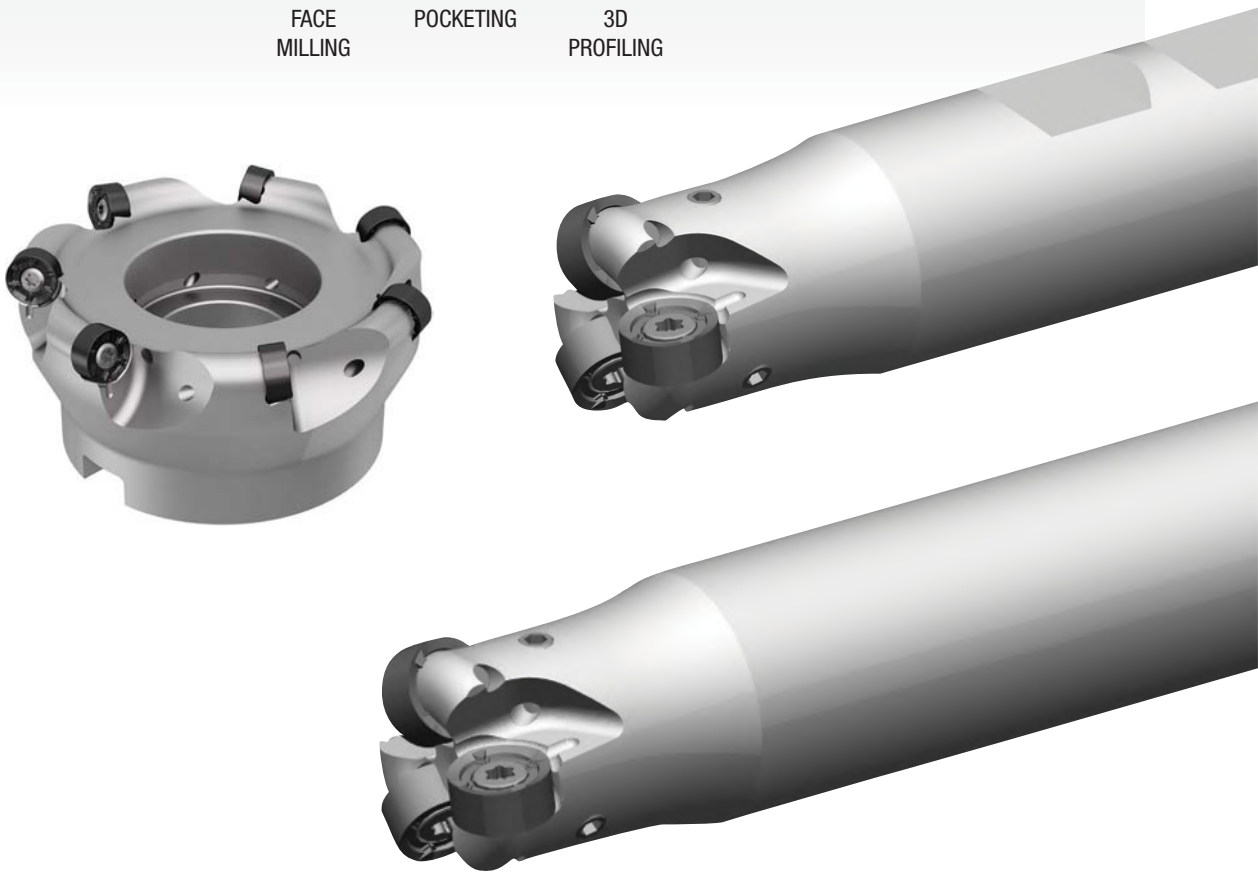
GENERAL ENGINEERING

APPLICATIONS

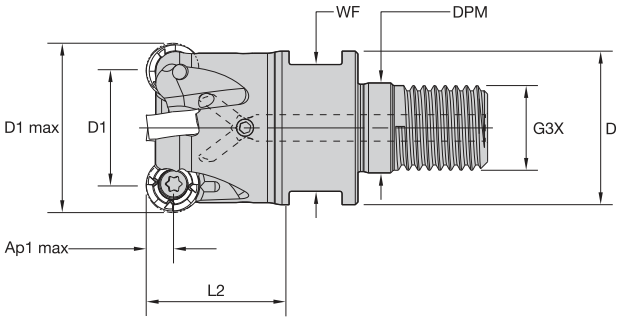
FACE MILLING

POCKETING

3D PROFILING

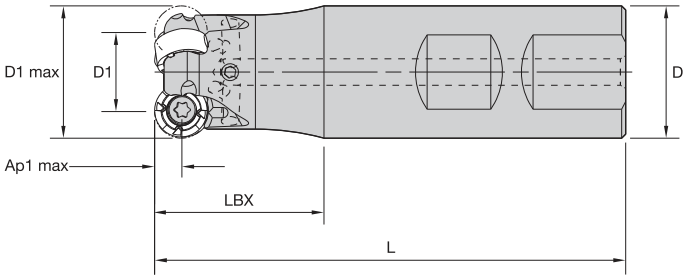


M200 • iC10 • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210273	M200D25Z03M12RN10	25	15	21	12,5	M12	32	17	5,0	3	0.6	54700	Yes	0,08
5210274	M200D32Z04M16RN10	32	22	29	17,0	M16	40	24	5,0	4	0.5	48300	Yes	0,18
5210275	M200D35Z05M16RN10	35	25	29	17,0	M16	40	24	5,0	5	0.5	46200	Yes	0,20
5210276	M200D42Z06M16RN10	42	32	29	17,0	M16	40	25	5,0	6	0.4	42200	Yes	0,24

M200 • iC10 • Weldon® End Mills • Metric

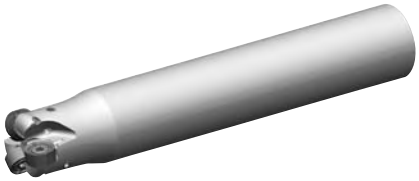


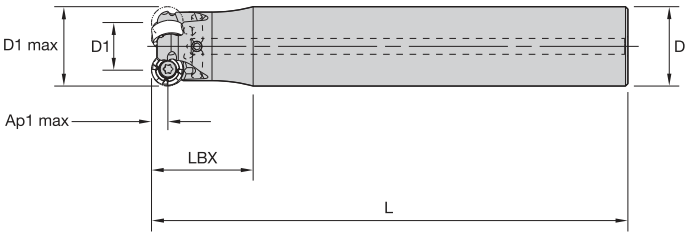
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210277	M200D25Z03B25RN10	25	15	25	89	40	5,0	3	0.6	54700	Yes	0,27
5210278	M200D32Z04B32RN10	32	22	32	101	40	5,0	4	0.5	48300	Yes	0,52

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

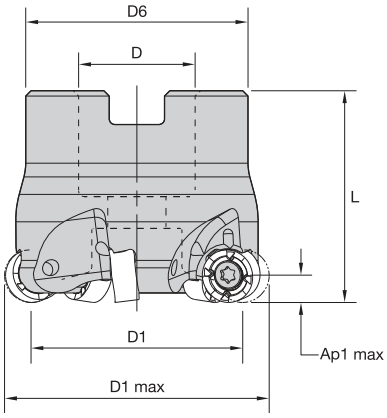
M200 • iC10 • Cylindrical End Mills • Metric





order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210279	M200D25Z03A25RN10L150	25	15	25	150	32	5,0	3	0.6	54700	Yes	0,50
5210300	M200D25Z03A25RN10L200	25	15	25	200	32	5,0	3	0.6	54700	Yes	0,69
5210301	M200D25Z03A32RN10L250	25	15	32	250	32	5,0	3	0.6	54700	Yes	1,42
5210302	M200D28Z03A25RN10L200	28	18	25	200	40	5,0	3	0.6	51600	Yes	0,70
5210304	M200D32Z03A32RN10L200	32	22	32	200	40	5,0	3	0.5	48300	Yes	1,14
5210303	M200D32Z04A32RN10L150	32	22	32	150	40	5,0	4	0.5	48300	Yes	0,83

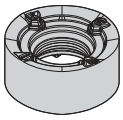
M200 • iC10 • Shell Mills • Metric

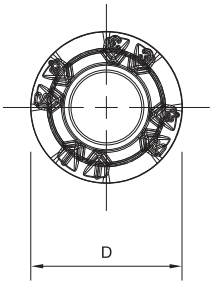


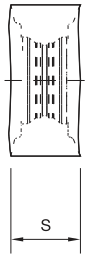
order number	catalogue number	D1 max	D1	D	D6	L	L1	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210305	M200D40Z04RN10	40	30	16	38	40	40	5,0	4	0.4	43200	Yes	0,23
5210306	M200D40Z06RN10	40	30	16	38	40	40	5,0	6	0.4	43200	Yes	0,24
5210307	M200D50Z05RN10	50	40	22	42	40	40	5,0	5	0.3	38600	Yes	0,32
5210308	M200D50Z06RN10	50	40	22	42	40	40	5,0	6	0.3	38600	Yes	0,32
5210309	M200D52Z06RN10	52	42	22	49	50	50	5,0	6	0.3	37900	Yes	0,52

NOTE: Socket-head cap screw and socket-head cap screw with coolant groove must be ordered separately.

M200 • RN.J10… • RNGJ-ML





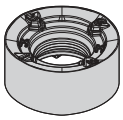


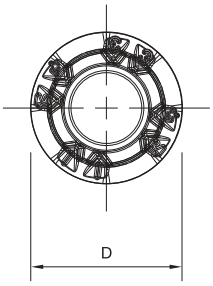
● first choice
○ alternate choice

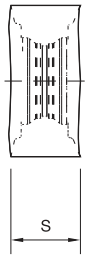
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ10T3M0EML	2	10,00	3,93	0,04	-	-	-	-	5274456	-	-	5520352	6383656	5274457

M200 • RN.J10… • RNGJ-MM





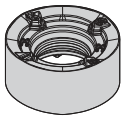


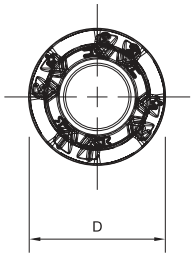
● first choice
○ alternate choice

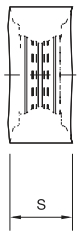
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

catalogue number	number of indexes	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ10T3M0SMM	8	10,00	3,93	0,09	-	-	-	-	5274511	-	-	5520353	6291550	5274512

M200 • RN.J10… • RNPJ-MM





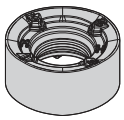


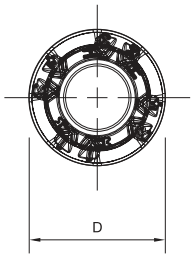
● first choice
○ alternate choice

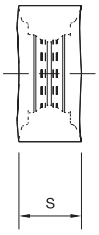
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ10T3M0SMM	2	10,00	3,93	0,09	-	-	-	-	5276197	5276196	5542327	-	6408151	-

M200 • RN.J10… • RNPJ-MH





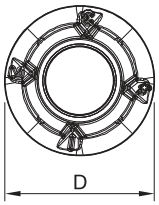


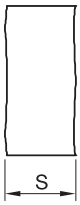
● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ10T3M0SMH	2	10,00	3,93	0,18	5276243	-	-	-	5276240	5276199	5542328	-	6408152	5476633

M200 • RN.J10… • RNGJ-ALP





● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

catalogue number	number of indexes	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ10T3M0FALP	8	10,00	3,93	0,02	-	-	6065590	-	-	-	-	-	-	-

M200 • RN.J10… • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	ML	WP25PM	**MM**	**WP40PM**	MM	WP40PM
P3–P4	ML	WP25PM	**MM**	**WP25PM**	MH	WP40PM
P5–P6	ML	WP35CM	**MM**	**WP35CM**	MH	WP35CM
M1–M2	ML	WP25PM	**ML**	**WU35PM**	MM	WU35PM
M3	ML	WP25PM	**MM**	**WU35PM**	MM	WU35PM
K1–K2	MH	WK15CM	**MH**	**WK15CM**	MH	WP20CM
K3	MH	WK15CM	**MH**	**WK15CM**	MH	WP25PM
N1–N2	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
N3	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
S1–S2	ML	WS30PM	**MM**	**WS30PM**	MM	WU35PM
S3	ML	WS30PM	**MM**	**WU35PM**	MM	WU35PM
S4	ML	WS30PM	**MM**	**WU35PM**	MM	WU35PM
H1	MH	WP25PM	**MH**	**WP20CM**	–	–

M200 • RN.J10… • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
P	1	–	–	–	–	–	–	–	–	–	660	**580**	540	395	**340**	325
	2	–	–	–	–	–	–	–	–	–	410	**370**	330	330	**290**	240
	3	–	–	–	–	–	–	–	–	–	370	**330**	305	305	**260**	210
	4	–	–	–	–	–	–	–	–	–	275	**260**	230	270	**220**	180
	5	–	–	–	–	–	–	–	–	–	330	**300**	275	220	**205**	180
	6	–	–	–	–	–	–	–	–	–	230	**205**	175	200	**150**	120
M	1	–	–	–	–	–	–	–	–	–	270	**240**	210	245	**215**	200
	2	–	–	–	–	–	–	–	–	–	245	**210**	190	220	**190**	155
	3	–	–	–	–	–	–	–	–	–	190	**175**	150	170	**145**	115
K	1	505	**460**	**410**	400	**290**	**215**	–	–	–	430	**390**	355	275	**245**	220
	2	400	**355**	**330**	350	**235**	**170**	–	–	–	340	**305**	280	215	**190**	180
	3	335	**300**	**275**	280	**245**	**165**	–	–	–	290	**260**	240	180	**160**	145
N	1	–	–	–	–	–	–	1290	**1135**	1050	–	–	–	–	–	–
	2	–	–	–	–	–	–	1135	**1050**	910	–	–	–	–	–	–
	3	–	–	–	–	–	–	1135	**1050**	910	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30
	2	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30
	3	–	–	–	–	–	–	–	–	–	–	–	–	60	**50**	30
	4	–	–	–	–	–	–	–	–	–	–	–	–	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	170	**140**	115	145	**110**	85
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU35PM		
P	1	545	**475**	445	355	**310**	295	445	**385**	360	280	**245**	230	310	**275**	260
	2	335	**305**	275	300	**260**	215	365	**325**	265	235	**205**	170	265	**230**	190
	3	305	**275**	245	275	**235**	190	340	**290**	235	215	**185**	150	240	**205**	170
	4	230	**210**	190	245	**205**	160	300	**245**	200	195	**160**	130	215	**180**	145
	5	310	**275**	250	205	**185**	160	245	**230**	200	160	**140**	130	180	**160**	145
	6	190	**160**	130	180	**140**	110	220	**170**	130	140	**110**	85	155	**120**	95
M	1	245	**220**	185	235	**205**	185	270	**240**	220	260	**190**	115	205	**180**	160
	2	220	**190**	170	210	**180**	150	245	**215**	175	230	**170**	105	185	**155**	130
	3	175	**155**	140	155	**140**	110	185	**160**	125	190	**140**	80	140	**120**	95
K	1	355	**320**	290	–	–	–	–	–	–	–	–	–	–	–	–
	2	280	**250**	230	–	–	–	–	–	–	–	–	–	–	–	–
	3	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	1075	**945**	945	–	–	–
	2	–	–	–	–	–	–	–	–	–	945	**875**	845	–	–	–
	3	–	–	–	–	–	–	–	–	–	875	**760**	760	–	–	–
S	1	–	–	–	50	**40**	35	55	**50**	35	62	**45**	27	40	**35**	30
	2	–	–	–	50	**40**	35	55	**50**	35	55	**40**	26	40	**35**	30
	3	–	–	–	60	**50**	35	65	**55**	35	64	**46**	29	55	**40**	30
	4	80	**60**	40	80	**60**	40	100	**70**	50	90	**66**	42	70	**55**	35
H	1	–	–	–	–	–	–	160	**120**	90	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M200 • RN.J10… • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 5,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,13	**0,44**	0,80	0,10	**0,32**	0,57	0,07	**0,24**	0,43	0,06	**0,21**	0,37	0,06	**0,19**	0,34	ML
MM	0,28	**0,50**	0,91	0,20	**0,36**	0,66	0,15	**0,27**	0,49	0,13	**0,24**	0,43	0,12	**0,22**	0,39	MM
MH	0,46	**0,58**	0,96	0,33	**0,42**	0,69	0,25	**0,31**	0,51	0,22	**0,27**	0,45	0,20	**0,25**	0,41	MH

At 2,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,15	**0,51**	0,92	0,11	**0,37**	0,66	0,08	**0,27**	0,49	0,07	**0,24**	0,43	0,07	**0,22**	0,39	ML
MM	0,32	**0,58**	1,06	0,23	**0,42**	0,76	0,18	**0,31**	0,57	0,15	**0,27**	0,49	0,14	**0,25**	0,45	MM
MH	0,54	**0,67**	1,11	0,39	**0,48**	0,80	0,29	**0,36**	0,59	0,25	**0,32**	0,52	0,23	**0,29**	0,47	MH

At 1,25 Axial Depth of Cut (ap)

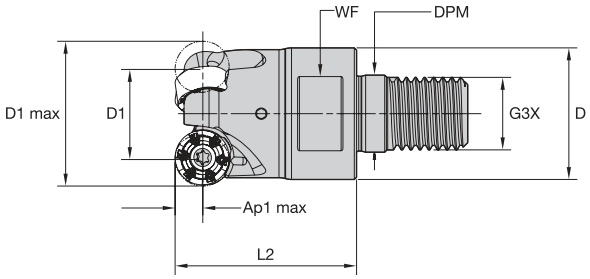
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,20	**0,67**	1,21	0,14	**0,48**	0,87	0,11	**0,36**	0,65	0,09	**0,31**	0,56	0,09	**0,29**	0,52	ML
MM	0,43	**0,77**	1,39	0,31	**0,55**	1,00	0,23	**0,41**	0,74	0,20	**0,36**	0,65	0,18	**0,33**	0,59	MM
MH	0,70	**0,88**	1,46	0,51	**0,63**	1,04	0,38	**0,47**	0,78	0,33	**0,41**	0,68	0,30	**0,38**	0,62	MH

At 0,63 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,27	**0,92**	1,67	0,20	**0,66**	1,19	0,15	**0,49**	0,89	0,13	**0,43**	0,77	0,12	**0,39**	0,71	ML
MM	0,58	**1,05**	1,92	0,42	**0,75**	1,37	0,31	**0,56**	1,02	0,27	**0,49**	0,88	0,25	**0,45**	0,81	MM
MH	0,96	**1,21**	2,02	0,69	**0,87**	1,43	0,52	**0,65**	1,06	0,45	**0,56**	0,93	0,41	**0,52**	0,85	MH

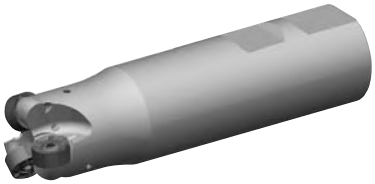
NOTE: Use "Light Machining" value as starting feed rate.

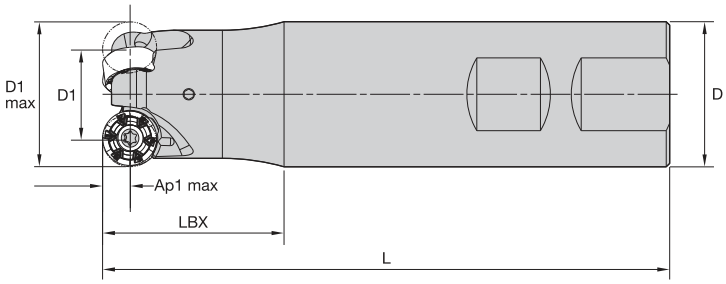
M200 • RN.J12... • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147560	M200D32Z03M16RN12	32	20	29	17,0	M16	40	24	3,0	3	0.5	39160	Yes	0,18
4147561	M200D35Z03M16RN12	35	23	29	17,0	M16	40	24	3,0	3	0.4	37440	Yes	0,19
4147562	M200D42Z04M16RN12	42	30	29	17,0	M16	40	24	3,0	4	0.4	34180	Yes	0,23

M200 • RN.J12... • Weldon® Shank • Metric



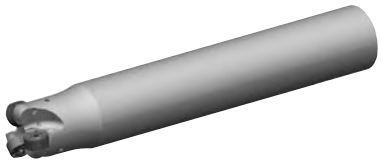


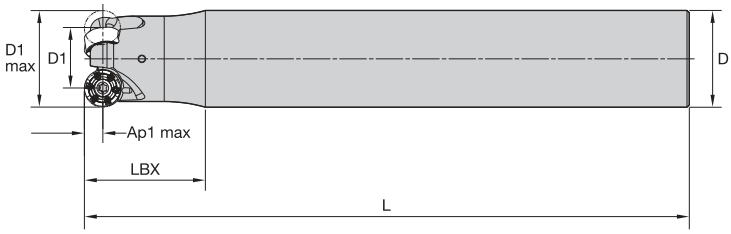
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147564	M200D32Z03B32RN12	32	20	32	125	40	3,0	3	0.5	39160	Yes	0,65

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

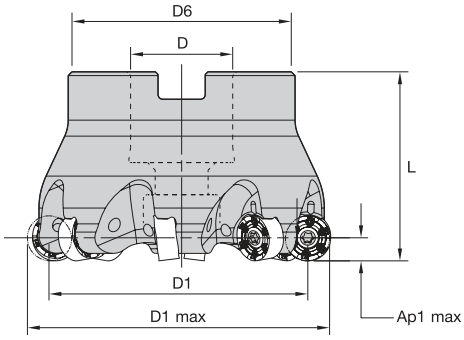
M200 • RN.J12... • Cylindrical Shank • Metric





order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147567	M200D32Z02A32RN12L250	32	20	32	250	40	3,0	2	0.4	39160	Yes	1,42
4147566	M200D32Z03A32RN12L200	32	20	32	200	40	3,0	3	0.5	39160	Yes	1,10

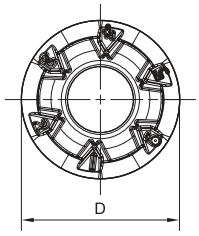
M200 • RN.J12... • Shell Mills • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147568	M200D40Z04RN12	40	28	16	38	40	3,0	4	0.4	35020	Yes	0,22
4147569	M200D50Z04RN12	50	38	22	42	40	3,0	4	0.5	31330	Yes	0,29
4147570	M200D50Z05RN12	50	38	22	42	40	3,0	5	0.3	31330	Yes	0,29
4147571	M200D52Z05RN12	52	40	22	49	50	3,0	5	0.5	30720	Yes	0,50
4147572	M200D63Z05RN12	63	51	22	49	50	3,0	5	0.5	27910	Yes	0,63
4147573	M200D63Z07RN12	63	51	22	49	50	3,0	7	0.3	27910	Yes	0,63
4147574	M200D66Z07RN12	66	54	27	60	50	3,0	7	0.3	27260	Yes	0,82
4147575	M200D80Z06RN12	80	68	27	60	50	3,0	6	0.5	24760	Yes	1,02
4147576	M200D80Z08RN12	80	68	27	60	50	3,0	8	0.2	24760	Yes	1,02
4147577	M200D100Z07RN12	100	88	32	78	50	3,0	7	0.2	22150	Yes	1,45
4147578	M200D100Z09RN12	100	88	32	78	50	3,0	9	0.2	22150	Yes	1,41

NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

M200 • RN.J1204.. • RNGJ-ML

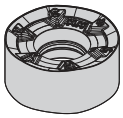


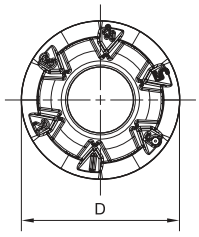
● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0EML	2	12,00	4,75	0,04	-	-	-	-	5123863	-	-	5520350	6408153	5123864

M200 • RN.J1204.. • RNGJ-MM



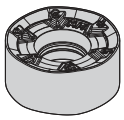


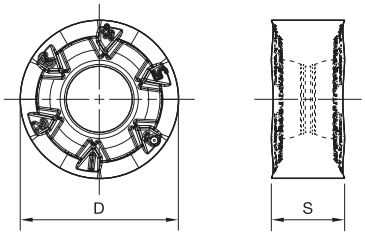
● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0SMM	2	12,00	4,75	0,09	-	-	-	-	5123867	5123869	-	5520351	6301432	5123868

M200 • RN.J1204.. • RNGJ-MH



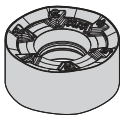


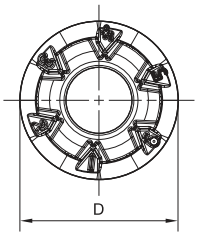
● first choice
○ alternate choice

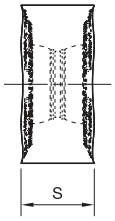
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0SMH	2	12,00	4,75	0,19	-	5123900	-	-	5123901	5123903	-	-	6408154	5123902

M200 • RN.J1204.. • RNPJ-MM





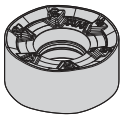


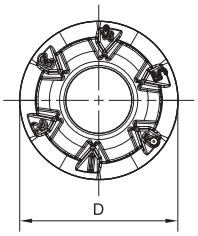
● first choice
○ alternate choice

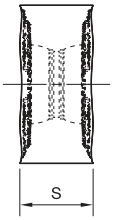
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1204M0SMM	2	12,00	4,75	0,09	-	-	-	-	5276361	5276360	5542329	-	6344113	5476634

M200 • RN.J1204.. • RNPJ-MH





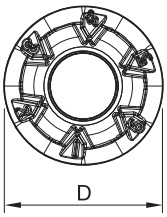


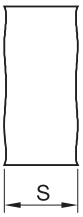
● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1204M0SMH	12	12,00	4,75	0,18	5276366	-	-	-	5276364	5276363	5542340	-	6344114	5476635

M200 • RN.J1204.. • RNGJ-ALP





● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0FALP	12	12,00	4,75	0,02	-	-	6065661	-	-	-	-	-	-	-

M200 RN.J1204.. • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	ML	WP25PM	**MM**	**WP40PM**	MM	WP40PM
P3–P4	ML	WP25PM	**MM**	**WP25PM**	MH	WP40PM
P5–P6	ML	WP35CM	**MM**	**WP35CM**	MH	WP35CM
M1–M2	ML	WP25PM	**ML**	**WU35PM**	MM	WU35PM
M3	ML	WP25PM	**MM**	**WU35PM**	MM	WU35PM
K1–K2	MH	WK15CM	**MH**	**WK15CM**	MH	WP20CM
K3	MH	WK15PM	**MH**	**WK15PM**	MH	WP25PM
N1–N2	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
N3	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
S1–S2	ML	WS30PM	**MM**	**WS30PM**	MM	WU35PM
S3	ML	WS30PM	**MM**	**WU35PM**	MM	WU35PM
S4	ML	WS30PM	**MM**	**WU35PM**	MM	WU35PM
H1	MH	WP25PM	**MH**	**WP20CM**	–	–

M200 RN.J1204.. • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
P	1	–	–	–	–	–	–	–	–	–	660	**580**	540	395	**340**	325
	2	–	–	–	–	–	–	–	–	–	410	**370**	330	330	**290**	240
	3	–	–	–	–	–	–	–	–	–	370	**330**	305	305	**260**	210
	4	–	–	–	–	–	–	–	–	–	275	**260**	230	270	**220**	180
	5	–	–	–	–	–	–	–	–	–	330	**300**	275	220	**205**	180
	6	–	–	–	–	–	–	–	–	–	230	**205**	175	200	**150**	120
M	1	–	–	–	–	–	–	–	–	–	270	**240**	210	245	**215**	200
	2	–	–	–	–	–	–	–	–	–	245	**210**	190	220	**190**	155
	3	–	–	–	–	–	–	–	–	–	190	**175**	150	170	**145**	115
K	1	505	**460**	410	400	**290**	215	–	–	–	430	**390**	355	275	**245**	220
	2	400	**355**	330	350	**235**	170	–	–	–	340	**305**	280	215	**190**	180
	3	335	**300**	275	280	**245**	165	–	–	–	290	**260**	240	180	**160**	145
N	1	–	–	–	–	–	–	1290	**1135**	1050	–	–	–	–	–	–
	2	–	–	–	–	–	–	1135	**1050**	910	–	–	–	–	–	–
	3	–	–	–	–	–	–	1135	**1050**	910	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30
	2	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30
	3	–	–	–	–	–	–	–	–	–	–	–	–	60	**50**	30
	4	–	–	–	–	–	–	–	–	–	–	–	–	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	170	**140**	115	145	**110**	85
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU35PM		
P	1	545	**475**	445	355	**310**	295	445	**385**	360	280	**245**	230	310	**275**	260
	2	335	**305**	275	300	**260**	215	365	**325**	265	235	**205**	170	265	**230**	190
	3	305	**275**	245	275	**235**	190	340	**290**	235	215	**185**	150	240	**205**	170
	4	230	**210**	190	245	**205**	160	300	**245**	200	195	**160**	130	215	**180**	145
	5	310	**275**	250	205	**185**	160	245	**230**	200	160	**140**	130	180	**160**	145
	6	190	**160**	130	180	**140**	110	220	**170**	130	140	**110**	85	155	**120**	95
M	1	245	**220**	185	235	**205**	185	270	**240**	220	260	**190**	115	205	**180**	160
	2	220	**190**	170	210	**180**	150	245	**215**	175	230	**170**	105	185	**155**	130
	3	175	**155**	140	155	**140**	110	185	**160**	125	190	**140**	80	140	**120**	95
K	1	355	**320**	290	–	–	–	–	–	–	–	–	–	–	–	–
	2	280	**250**	230	–	–	–	–	–	–	–	–	–	–	–	–
	3	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	1075	**945**	945	–	–	–
	2	–	–	–	–	–	–	–	–	–	945	**875**	845	–	–	–
	3	–	–	–	–	–	–	–	–	–	875	**760**	760	–	–	–
S	1	–	–	–	50	**40**	35	55	**50**	35	62	**45**	27	40	**35**	30
	2	–	–	–	50	**40**	35	55	**50**	35	55	**40**	26	40	**35**	30
	3	–	–	–	60	**50**	35	65	**55**	35	64	**46**	29	55	**40**	30
	4	80	**60**	40	80	**60**	40	100	**70**	50	90	**66**	42	70	**55**	35
H	1	–	–	–	–	–	–	160	**120**	90	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M200 RN.J1204.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 6,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,12	**0,18**	0,32	0,09	**0,13**	0,23	0,07	**0,10**	0,18	0,06	**0,08**	0,15	0,05	**0,08**	0,14	ML
MM	0,28	**0,51**	0,84	0,21	**0,37**	0,61	0,15	**0,28**	0,45	0,13	**0,24**	0,39	0,12	**0,22**	0,36	MM
MH	0,46	**0,70**	1,02	0,33	**0,50**	0,73	0,25	**0,38**	0,55	0,22	**0,33**	0,48	0,20	**0,30**	0,44	MH

At 3,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,14	**0,20**	0,37	0,10	**0,15**	0,27	0,08	**0,11**	0,20	0,07	**0,10**	0,18	0,06	**0,09**	0,16	ML
MM	0,33	**0,59**	0,97	0,24	**0,43**	0,70	0,18	**0,32**	0,52	0,16	**0,28**	0,45	0,14	**0,25**	0,42	MM
MH	0,54	**0,81**	1,18	0,39	**0,58**	0,85	0,29	**0,43**	0,63	0,25	**0,38**	0,55	0,23	**0,35**	0,51	MH

At 1,50 Axial Depth of Cut (ap)

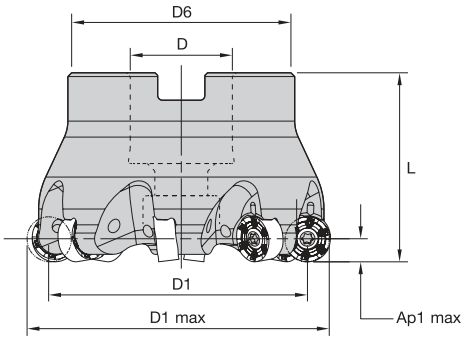
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,18	**0,27**	0,49	0,13	**0,19**	0,35	0,10	**0,15**	0,26	0,09	**0,13**	0,23	0,08	**0,12**	0,21	ML
MM	0,43	**0,77**	1,28	0,31	**0,56**	0,92	0,23	**0,42**	0,68	0,20	**0,36**	0,60	0,19	**0,33**	0,55	MM
MH	0,70	**1,06**	1,56	0,51	**0,76**	1,12	0,38	**0,57**	0,83	0,33	**0,50**	0,72	0,30	**0,45**	0,66	MH

At 0,75 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,25	**0,37**	0,67	0,18	**0,27**	0,48	0,14	**0,20**	0,36	0,12	**0,17**	0,32	0,11	**0,16**	0,29	ML
MM	0,59	**1,06**	1,77	0,43	**0,76**	1,26	0,32	**0,57**	0,94	0,28	**0,50**	0,81	0,25	**0,45**	0,75	MM
MH	0,96	**1,46**	2,16	0,69	**1,04**	1,53	0,52	**0,78**	1,14	0,45	**0,68**	0,99	0,41	**0,62**	0,90	MH

NOTE: Use "Light Machining" value as starting feed rate.

M200 • RN.J16... • Shell Mills • Metric



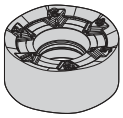
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5209989	**M200D50Z04RN16**	50	34	22	42	50	4,0	4	0.5	26700	Yes	0,36
5210210	**M200D52Z04RN16**	52	36	22	42	50	4,0	4	0.4	26000	Yes	0,39
5210211	**M200D63Z04RN16**	63	47	22	49	50	4,0	4	0.4	22700	Yes	0,58
5210212	**M200D63Z06RN16**	63	47	22	49	50	4,0	6	0.4	22700	Yes	0,56
5210213	**M200D66Z05RN16**	66	50	27	60	50	4,0	5	0.4	22000	Yes	0,69
5210214	**M200D80Z05RN16**	80	64	27	60	50	4,0	5	0.3	19500	Yes	0,88
5210215	**M200D80Z07RN16**	80	64	27	60	50	4,0	7	0.3	19500	Yes	0,89
5210216	**M200D100Z06RN16**	100	84	32	78	50	4,0	6	0.3	17000	Yes	1,36
5210217	**M200D100Z08RN16**	100	84	32	78	50	4,0	8	0.3	17000	Yes	1,37
5210218	**M200D125Z08RN16**	125	109	40	90	63	4,0	8	0.2	14900	Yes	2,50

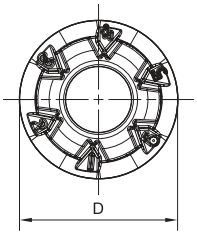
NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

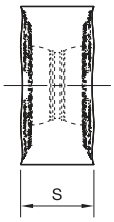
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M200 • RN.J1605.. • RNGJ-ML





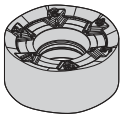


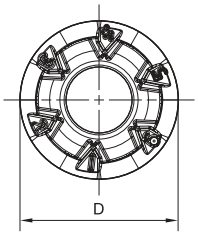
● first choice
○ alternate choice

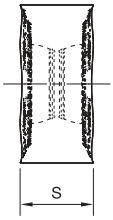
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1605M0EML	2	16,00	5,52	0,04	-	-	-	-	5274561	-	-	5520354	6408155	-

M200 • RN.J1605.. • RNPJ-MM





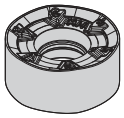


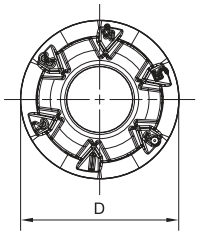
● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1605M0SMM	12	16,00	5,52	0,09	-	-	-	5276472	5276471	5276470	5542341	-	6408156	5476637

M200 • RN.J1605.. • RNPJ-MH



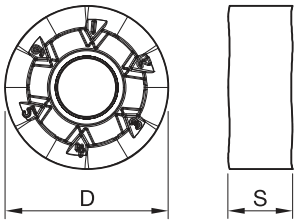


● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1605M0SMH	2	16,00	5,52	0,23	5276476	-	-	-	5276474	5276473	5542342	-	6408157	5476636

M200 • RN.J1605.. • RNGJ-ALP



● first choice
○ alternate choice

	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P				●	●	●	●	○	●	●
M				○	●	●	●	●	●	●
K	●	●		●	○	○				
N			●						○	
S					●	○	○	●	●	●
H				○	○			○		

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1605M0FALP	12	16,00	5,52	0,02	-	-	6065662	-	-	-	-	-	-	-

M200 • RN.J1605.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	ML	WP25PM	**MM**	**WP40PM**	MM	WP40PM
P3–P4	ML	WP25PM	**MM**	**WP25PM**	MH	WP40PM
P5–P6	ML	WP35CM	**MM**	**WP35CM**	MH	WP35CM
M1–M2	ML	WP25PM	**ML**	**WU35PM**	MM	WU35PM
M3	ML	WP25PM	**MM**	**WU35PM**	MM	WU35PM
K1–K2	MH	WK15CM	**MH**	**WK15CM**	MH	WP20CM
K3	MH	WK15CM	**MH**	**WP20CM**	MH	WP35CM
N1–N2	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
N3	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
S1–S2	ML	WS30PM	**ML**	**WS30PM**	ML	WU35PM
S3	ML	WS30PM	**ML**	**WU35PM**	ML	WU35PM
S4	ML	WS30PM	**ML**	**WU35PM**	ML	WU35PM
H1	MH	WP25PM	**MH**	**WP20CM**	–	–

M200 • RN.J1605.. • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
P	1	–	–	–	–	–	–	–	–	–	660	**580**	540	395	**340**	325
	2	–	–	–	–	–	–	–	–	–	410	**370**	330	330	**290**	240
	3	–	–	–	–	–	–	–	–	–	370	**330**	305	305	**260**	210
	4	–	–	–	–	–	–	–	–	–	275	**260**	230	270	**220**	180
	5	–	–	–	–	–	–	–	–	–	330	**300**	275	220	**205**	180
	6	–	–	–	–	–	–	–	–	–	230	**205**	175	200	**150**	120
M	1	–	–	–	–	–	–	–	–	–	270	**240**	210	245	**215**	200
	2	–	–	–	–	–	–	–	–	–	245	**210**	190	220	**190**	155
	3	–	–	–	–	–	–	–	–	–	190	**175**	150	170	**145**	115
K	1	505	**460**	**410**	400	**290**	**215**	–	–	–	430	**390**	355	275	**245**	220
	2	400	**355**	**330**	350	**235**	**170**	–	–	–	340	**305**	280	215	**190**	180
	3	335	**300**	**275**	280	**245**	**165**	–	–	–	290	**260**	240	180	**160**	145
N	1	–	–	–	–	–	–	1290	**1135**	1050	–	–	–	–	–	–
	2	–	–	–	–	–	–	1135	**1050**	910	–	–	–	–	–	–
	3	–	–	–	–	–	–	1135	**1050**	910	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30
	2	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30
	3	–	–	–	–	–	–	–	–	–	–	–	–	60	**50**	30
	4	–	–	–	–	–	–	–	–	–	–	–	–	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	170	**140**	115	145	**110**	85
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU35PM		
P	1	545	**475**	445	355	**310**	295	445	**385**	360	280	**245**	230	310	**275**	260
	2	335	**305**	275	300	**260**	215	365	**325**	265	235	**205**	170	265	**230**	190
	3	305	**275**	245	275	**235**	190	340	**290**	235	215	**185**	150	240	**205**	170
	4	230	**210**	190	245	**205**	160	300	**245**	200	195	**160**	130	215	**180**	145
	5	310	**275**	250	205	**185**	160	245	**230**	200	160	**140**	130	180	**160**	145
	6	190	**160**	130	180	**140**	110	220	**170**	130	140	**110**	85	155	**120**	95
M	1	245	**220**	185	235	**205**	185	270	**240**	220	260	**190**	115	205	**180**	160
	2	220	**190**	170	210	**180**	150	245	**215**	175	230	**170**	105	185	**155**	130
	3	175	**155**	140	155	**140**	110	185	**160**	125	190	**140**	80	140	**120**	95
K	1	355	**320**	290	–	–	–	–	–	–	–	–	–	–	–	–
	2	280	**250**	230	–	–	–	–	–	–	–	–	–	–	–	–
	3	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	1075	**945**	945	–	–	–
	2	–	–	–	–	–	–	–	–	–	945	**875**	845	–	–	–
	3	–	–	–	–	–	–	–	–	–	875	**760**	760	–	–	–
S	1	–	–	–	50	**40**	35	55	**50**	35	62	**45**	27	40	**35**	30
	2	–	–	–	50	**40**	35	55	**50**	35	55	**40**	26	40	**35**	30
	3	–	–	–	60	**50**	35	65	**55**	35	64	**46**	29	55	**40**	30
	4	80	**60**	40	80	**60**	40	100	**70**	50	90	**66**	42	70	**55**	35
H	1	–	–	–	–	–	–	160	**120**	90	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M200 • RN.J1605.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,12	**0,37**	0,48	0,09	**0,27**	0,35	0,07	**0,20**	0,26	0,06	**0,17**	0,23	0,05	**0,16**	0,21	ML
MM	0,28	**0,70**	0,81	0,21	**0,50**	0,58	0,15	**0,38**	0,44	0,13	**0,33**	0,38	0,12	**0,30**	0,35	MM
MH	0,53	**0,70**	1,17	0,38	**0,50**	0,84	0,29	**0,38**	0,63	0,25	**0,33**	0,55	0,23	**0,30**	0,50	MH

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,14	**0,43**	0,56	0,10	**0,31**	0,40	0,08	**0,23**	0,30	0,07	**0,20**	0,26	0,06	**0,18**	0,24	ML
MM	0,33	**0,81**	0,94	0,24	**0,58**	0,67	0,18	**0,43**	0,50	0,16	**0,38**	0,44	0,14	**0,35**	0,40	MM
MH	0,62	**0,81**	1,36	0,44	**0,58**	0,97	0,33	**0,43**	0,72	0,29	**0,38**	0,63	0,27	**0,35**	0,58	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,19	**0,56**	0,73	0,14	**0,40**	0,53	0,10	**0,30**	0,40	0,09	**0,26**	0,34	0,08	**0,24**	0,32	ML
MM	0,43	**1,06**	1,24	0,31	**0,76**	0,89	0,23	**0,57**	0,66	0,20	**0,50**	0,57	0,19	**0,45**	0,53	MM
MH	0,81	**1,06**	1,79	0,58	**0,76**	1,28	0,44	**0,57**	0,95	0,38	**0,50**	0,83	0,35	**0,45**	0,76	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,26	**0,77**	1,01	0,19	**0,55**	0,73	0,14	**0,41**	0,54	0,12	**0,36**	0,47	0,11	**0,33**	0,43	ML
MM	0,59	**1,46**	1,70	0,43	**1,04**	1,21	0,32	**0,78**	0,90	0,28	**0,68**	0,79	0,25	**0,62**	0,72	MM
MH	1,11	**1,46**	2,48	0,80	**1,04**	1,75	0,60	**0,78**	1,30	0,52	**0,68**	1,13	0,48	**0,62**	1,03	MH

NOTE: Use "Light Machining" value as starting feed rate.

M170™ Series

M170 IC07, M170 IC10, M170 IC12, M170 IC16 Copy Mills

Use the M170 for hard machining in die and mold manufacturing while maintaining long tool life and smooth chip flow.

Nickel-coated cutter bodies improve tool life and chip flow.

High tooth density for high-speed machining (HSM).

Strong PSTS inserts provide ramping and helical interpolation capabilities.

The M170 is equipped with a hard nickel-coated body and tough PSTS inserts to enhance performance in die and mold manufacturing.

INSERT OFFERING

iC07
7mm iC insert RD.X
Up to 3,5mm Ap max.
Diameter range
12–35mm.

iC10
10mm iC insert RDPX
Up to 5mm Ap max.
Diameter range
20–52mm.

iC12
12mm iC insert RDPX
Up to 6mm Ap max.
Diameter range
24–100mm.

iC16
16mm iC insert RDPX
Up to 8mm Ap max.
Diameter range
32–125mm.

MAXIMIZE PERFORMANCE WITH M170

PRODUCT

SERIES

M170™

DIAMETER RANGE

12–125mm

SHANK TYPES

Screw-On End Mills
Weldon® End Mills
Shell Mills
Cylindrical End Mills

INDUSTRY

GENERAL ENGINEERING

APPLICATIONS

3D PROFILING | FACE MILLING | HELICAL MILLING | POCKETING | RAMPING BLANK | SIDE MILLING/ SHOULDER MILLING: BALL NOSE | SLOTTING: BALL NOSE

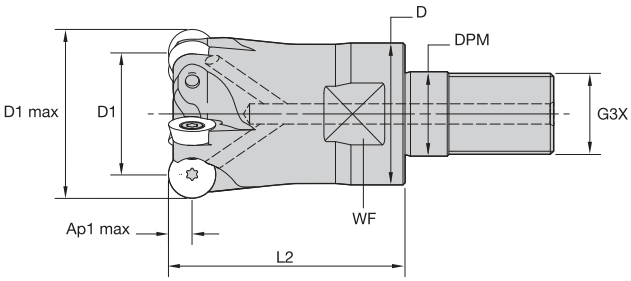
STRONG AND DURABLE

The nickel-coated tool body and sturdy PSTS inserts ensure longer tool life.

DIE AND MOLD

Designed and suited for hard machining in die and mold manufacturing.

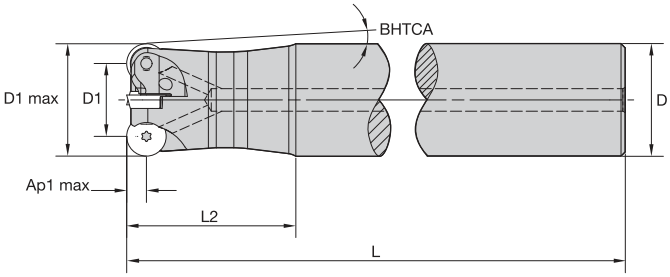
M170 • Screw-On RD07T1.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3935337	M170D012Z02M08RD07T	12	5	13	8,5	M8	23	10	3,5	2	22.0	26200	Yes	0,02

NOTE: All spare parts except the insert screws must be ordered separately.

M170 • Cylindrical Shank RD07T1.. • Metric



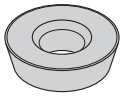
order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3935339	M170D012Z02A12RD07TL100	12	5	12	100	20	—	3,5	2	22.0	26200	Yes	0,07
3935340	M170D012Z02A16RD07TL120	12	5	16	120	60	2.0	3,5	2	22.0	26200	Yes	0,14
3935341	M170D012Z02A16RD07TL140	12	5	16	140	80	1.5	3,5	2	22.0	26200	Yes	0,16

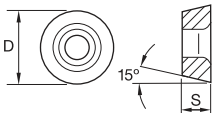
NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M170 • RDHX-MH • RD07T1..



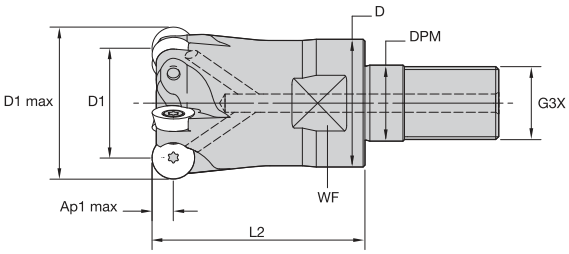


● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDHX07T1M0SNMH	7,00	1,98	0,08	3960578	3960573	-

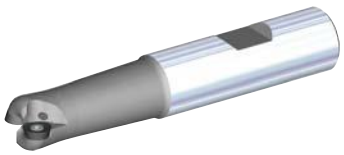
M170 • Screw-On RD0702.. • Metric

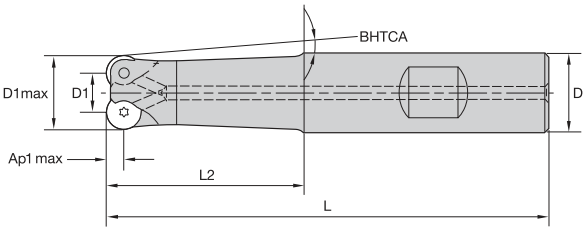


order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926607	M170D015Z02M08RD07	15	8	13	8,5	M8	23	10	3,5	2	18.0	21200	Yes	0,03
3926608	M170D016Z03M08RD07	16	9	13	8,5	M8	23	10	3,5	3	9.0	21200	Yes	0,03
3926609	M170D020Z04M10RD07	20	13	18	10,5	M10	30	14	3,5	4	12.5	19600	Yes	0,06
3926610	M170D025Z05M12RD07	25	18	21	12,5	M12	35	19	3,5	5	8.5	12700	Yes	0,10

NOTE: All spare parts except the insert screws must be ordered separately.

M170 • Weldon® Shank RD0702.. • Metric

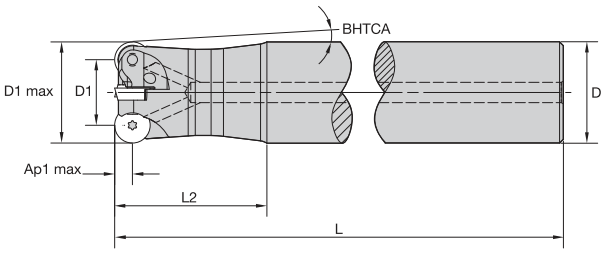




order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3929403	M170D015Z02B16RD07	15	8	16	90	40	1.0	3,5	2	18.0	21200	Yes	0,11

NOTE: All spare parts except the insert screws must be ordered separately.

M170 • Cylindrical Shank RD0702.. • Metric



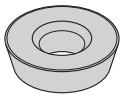
order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3929404	M170D015Z02A16RD07L110	15	8	16	110	60	0.5	3,5	2	18.0	21200	Yes	0,14
3929405	M170D015Z02A16RD07L150	15	8	16	150	60	0.5	3,5	2	18.0	21200	Yes	0,20
3929407	M170D016Z02A16RD07L150	16	9	16	150	30	—	3,5	2	9.0	21200	Yes	0,21
3929406	M170D016Z03A16RD07L110	16	9	16	110	20	—	3,5	3	9.0	21200	Yes	0,16
3929409	M170D020Z03A20RD07L140	20	13	20	140	40	—	3,5	3	12.0	10600	Yes	0,29
3929408	M170D020Z04A20RD07L115	20	13	20	115	30	—	3,5	4	12.0	10600	Yes	0,25

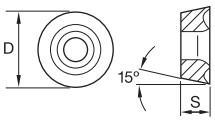
NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M170 • RDPX-MH • RD0702..





● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX0702M0SNMH	7,00	2,38	0,08	3959627	3959626	3959625

M170 • RD07.. • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	–	–	–	–	–	–
P3–P4	MH	TN2505	**MH**	**TN6525**	MH	TN6540
P5–P6	MH	TN2505	**MH**	**TN6525**	MH	TN6540
M1–M2	–	–	–	–	–	–
M3	–	–	–	–	–	–
K1–K2	MH	TN2505	**MH**	**TN2505**	MH	TN6525
K3	MH	TN2505	**MH**	**TN2505**	MH	TN6525
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	MH	TN2505	**MH**	**TN2505**	–	–

M170 • RD07.. • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540		
P	1	550	**420**	360	410	**320**	280	360	**280**	240
	2	320	**240**	205	320	**250**	215	250	**190**	170
	3	320	**240**	205	280	**215**	185	215	**170**	140
	4	–	–	–	235	**170**	145	180	**130**	110
	5	–	–	–	310	**235**	200	240	**180**	150
	6	–	–	–	205	**160**	130	160	**120**	100
M	1	–	–	–	190	**120**	80	130	**80**	60
	2	–	–	–	120	**80**	50	80	**50**	40
	3	–	–	–	125	**80**	55	85	**50**	40
K	1	400	**300**	250	275	**245**	220	220	**205**	180
	2	540	**365**	280	215	**190**	180	175	**155**	140
	3	310	**190**	155	180	**160**	145	155	**145**	125
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**35**	30
	2	–	–	–	–	–	–	25	**20**	10
	3	–	–	–	–	–	–	70	**40**	30
	4	–	–	–	–	–	–	60	**30**	25
H	1	175	**140**	95	–	–	–	–	–	–
	2	175	**140**	95	–	–	–	–	–	–
	3	140	**115**	80	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M170 • RD07.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 3,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MH	0,23	**0,46**	0,74	0,17	**0,33**	0,54	0,13	**0,25**	0,40	0,11	**0,22**	0,35	0,10	**0,20**	0,32	MH

At 1,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MH	0,28	**0,56**	0,91	0,20	**0,41**	0,65	0,15	**0,31**	0,49	0,13	**0,27**	0,43	0,12	**0,24**	0,39	MH

At 0,75mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MH	0,37	**0,75**	1,21	0,27	**0,54**	0,87	0,20	**0,40**	0,65	0,18	**0,35**	0,56	0,16	**0,32**	0,52	MH

At 0,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MH	0,45	**0,91**	1,47	0,32	**0,65**	1,05	0,24	**0,49**	0,78	0,21	**0,42**	0,68	0,19	**0,39**	0,62	MH

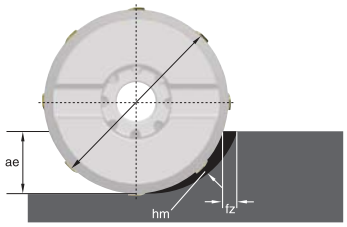
NOTE: Use "Light Machining" value as starting feed rate.

WIDIA™ Indexable Milling Additional Application Advice RD07.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

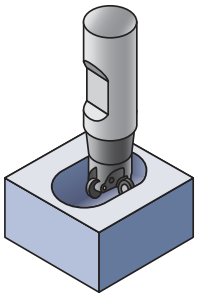
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 0,5mm	0,59mm	0,42mm	0,34mm	0,30mm	0,26mm	0,19mm
Ap1 = 0,75mm	0,50mm	0,36mm	0,29mm	0,25mm	0,22mm	0,16mm
Ap1 = 1mm	0,42mm	0,30mm	0,24mm	0,21mm	0,19mm	0,13mm
Ap1 = 1,5mm	0,34mm	0,24mm	0,20mm	0,17mm	0,15mm	0,11mm
Ap1 = 3,5mm	0,22mm	0,16mm	0,13mm	0,11mm	0,10mm	0,08mm

Example application highlighted.



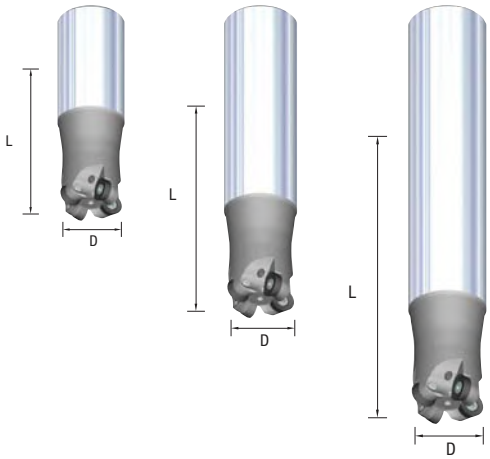
Example Cutting Conditions for RD..07... Insert in Pocketing, L/D ratio = 2 x D:

insert = RDPX0702M0SNMH		TN2505			TN6525			TN6540		
		feed per tooth fz (mm)/ae>50%								
		min	med	max	min	med	max	min	med	max
ae>50%	Recommended starting Ap1 = 0,5mm	0,19mm	0,22mm	0,30mm	0,19mm	0,30mm	0,35mm	0,19mm	0,30mm	0,40mm

2. Ap1 and vc corrections depend on L/D ratio

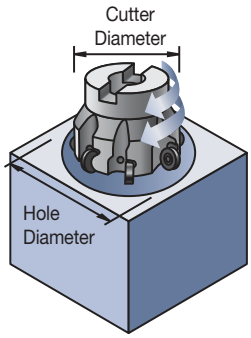
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65–75%	10–15%
>4	80–95%	20–40%

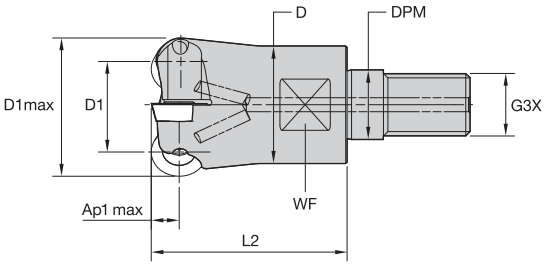


Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
12	17mm	17mm	3,5mm	22°	1mm
15	18mm	23mm	2,8mm	18°	2,2mm
16	20mm	25mm	1,9mm	9°	1,4mm
20	28mm	33mm	3,5mm	12°	1,5mm
25	36,5mm	43mm	3,5mm	8.5°	2,5mm
30	46,4mm	53mm	3,5mm	6.5°	2,5mm



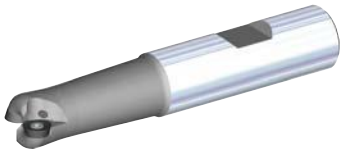
M170 • Screw-On RD1003.. • Metric

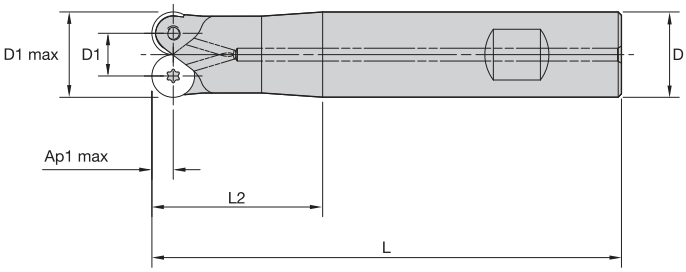


order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3934647	M170D020Z02M10RD10	20	10	18	10,5	M10	30	15	5,0	2	20.0	15900	Yes	0,06
3934649	M170D025Z03M12RD10	25	15	21	12,5	M12	35	19	5,0	3	8.0	12800	Yes	0,10
3934650	M170D030Z04M16RD10	30	20	29	17,0	M16	43	22	5,0	4	10.0	10600	Yes	0,24
3934652	M170D042Z06M16RD10	42	32	29	17,0	M16	45	22	5,0	6	6.0	7800	Yes	0,28

NOTE: All spare parts except the insert screws must be ordered separately.

M170 • Weldon® Shank RD1003.. • Metric





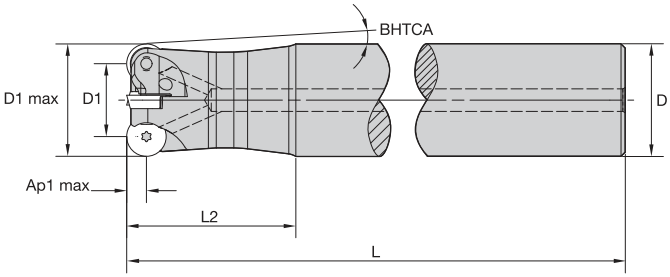
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940703	M170D020Z02B20RD10	20	10	20	110	40	5,0	2	20.0	15900	Yes	0,24
3940708	M170D025Z03B25RD10	25	15	25	110	40	5,0	3	9.0	12900	Yes	0,35

NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

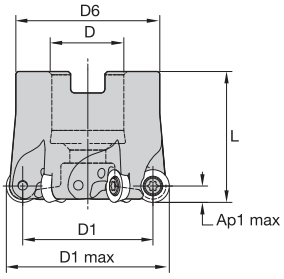
M170 • Cylindrical Shank RD1003.. • Metric



order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940704	M170D020Z02A20RD10L140	20	10	20	140	60	—	5,0	2	20.0	15900	Yes	0,30
3940705	M170D020Z02A25RD10L160	20	10	25	160	80	2.0	5,0	2	20.0	15900	Yes	0,48
3940706	M170D020Z02A25RD10L180	20	10	25	180	100	1.5	5,0	2	20.0	15900	Yes	0,53
3940707	M170D022Z02A20RD10L160	22	12	20	160	40	—	5,0	2	12.0	14400	Yes	0,35
3940709	M170D025Z02A25RD10L180	25	15	25	180	70	—	5,0	2	9.0	12800	Yes	0,61
3940710	M170D025Z02A25RD10L220	25	15	25	220	100	—	5,0	2	9.0	12800	Yes	0,74

NOTE: All spare parts except the insert screws must be ordered separately.

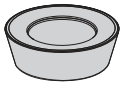
M170 • Shell Mills RD1003.. • Metric

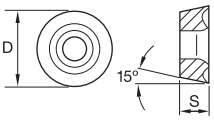


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940712	M170D040Z05RD10	40	30	16	37	40	5,0	5	7.2	9950	Yes	0,28
3940723	M170D042Z05RD10	42	32	16	37	40	5,0	5	5.8	9500	Yes	0,28
3940724	M170D050Z06RD10	50	40	22	44	40	5,0	6	5.2	7950	Yes	0,35
3940725	M170D052Z06RD10	52	42	22	44	50	5,0	6	3.0	7650	Yes	0,51

NOTE: All spare parts except the insert screws must be ordered separately.

M170 • RDPX-MM • RD1003..



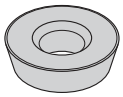


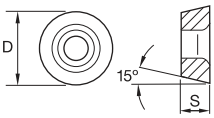
● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1003M0SNMM	10,00	3,18	0,11	–	3959633	3959582

M170 • RDPX-MH • RD1003..





● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1003M0SNMH	10,00	3,18	0,12	3959581	3959580	3959579

M170 • RD1003.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	MM	TN6525	**MM**	**TN6525**	MM	TN6540
P3–P4	MH	TN2505	**MH**	**TN6525**	MH	TN6540
P5–P6	MH	TN2505	**MH**	**TN6525**	MH	TN6540
M1–M2	–	–	**MM**	**TN6525**	MM	TN6540
M3	–	–	**MM**	**TN6525**	MM	TN6540
K1–K2	MH	TN2505	**MH**	**TN2505**	MH	TN6525
K3	MH	TN2505	**MH**	**TN2505**	MH	TN6525
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**MM**	**TN6540**	–	–
S3	–	–	**MM**	**TN6540**	–	–
S4	–	–	**MM**	**TN6540**	–	–
H1	MH	TN2505	**MH**	**TN2505**	–	–

M170 • RD1003.. • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540		
P	1	550	**420**	360	410	**320**	280	360	**280**	240
	2	320	**240**	205	320	**250**	215	250	**190**	170
	3	320	**240**	205	280	**215**	185	215	**170**	140
	4	–	**–**	–	235	**170**	145	180	**130**	110
	5	–	**–**	–	310	**235**	200	240	**180**	150
	6	–	**–**	–	205	**160**	130	160	**120**	100
M	1	–	**–**	–	190	**120**	80	130	**80**	60
	2	–	**–**	–	120	**80**	50	80	**50**	40
	3	–	**–**	–	125	**80**	55	85	**50**	40
K	1	400	**300**	250	275	**245**	220	220	**205**	180
	2	540	**365**	280	215	**190**	180	175	**155**	140
	3	310	**190**	155	180	**160**	145	155	**145**	125
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10
	3	–	**–**	–	–	**–**	–	70	**40**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25
H	1	175	**140**	95	–	**–**	–	–	**–**	–
	2	175	**140**	95	–	**–**	–	–	**–**	–
	3	140	**115**	80	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M170 • RD1003.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,28	**0,41**	0,74	0,20	**0,29**	0,53	0,15	**0,22**	0,4	0,13	**0,19**	0,35	0,12	**0,18**	0,32	MM
MH	0,33	**0,58**	0,98	0,24	**0,42**	0,71	0,18	**0,32**	0,53	0,16	**0,28**	0,46	0,14	**0,25**	0,42	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,35	**0,51**	0,93	0,25	**0,37**	0,67	0,19	**0,28**	0,50	0,17	**0,24**	0,44	0,15	**0,22**	0,40	MM
MH	0,42	**0,73**	1,23	0,30	**0,53**	0,88	0,23	**0,39**	0,66	0,20	**0,34**	0,57	0,18	**0,32**	0,53	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,47	**0,68**	1,25	0,34	**0,49**	0,89	0,25	**0,37**	0,67	0,22	**0,32**	0,58	0,20	**0,29**	0,53	MM
MH	0,56	**0,98**	1,66	0,40	**0,71**	1,18	0,30	**0,53**	0,88	0,26	**0,46**	0,76	0,24	**0,42**	0,70	MH

At 0,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,64	**0,94**	1,73	0,46	**0,68**	1,24	0,35	**0,51**	0,92	0,30	**0,44**	0,80	0,28	**0,40**	0,73	MM
MH	0,77	**1,36**	2,31	0,55	**0,97**	1,63	0,41	**0,73**	1,21	0,36	**0,63**	1,05	0,33	**0,58**	0,96	MH

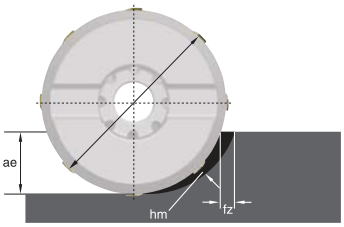
NOTE: Use "Light Machining" value as starting feed rate.

WIDIA™ Indexable Milling Additional Application Advice RD1003.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

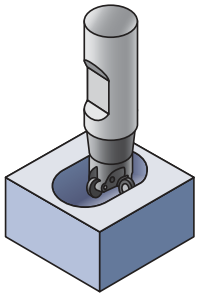
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 0,5mm	1,18mm	0,70mm	0,63mm	0,56mm	0,50mm	0,35mm
Ap1 = 0,75mm	0,95mm	0,62mm	0,56mm	0,50mm	0,45mm	0,30mm
Ap1 = 1mm	0,80mm	0,57mm	0,46mm	0,40mm	0,36mm	0,25mm
Ap1 = 2mm	0,57mm	0,40mm	0,33mm	0,28mm	0,25mm	0,18mm
Ap1 = 3mm	0,46mm	0,33mm	0,27mm	0,23mm	0,21mm	0,15mm
Ap1 = 5mm	0,36mm	0,25mm	0,21mm	0,18mm	0,16mm	0,11mm

Example application highlighted.

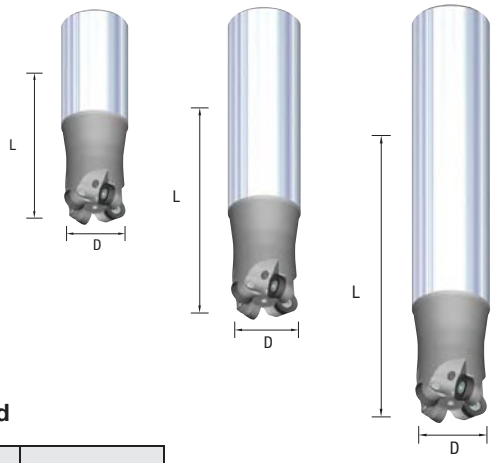


Example Cutting Conditions for RD..10... Insert in Pocketing, L/D ratio = 2 x D:

insert = RDPX1003M0SN			TN2505			TN6525			TN6540		
			feed per tooth fz (mm)/ae>50%								
			min	med	max	min	med	max	min	med	max
Edge Geometry MM	ae>50%	Recommended starting Ap1 = 1mm	–	–	–	0,25mm	0,30mm	0,40mm	0,25mm	0,32mm	0,45mm
Edge Geometry MH	ae>50%	Recommended starting Ap1 = 1mm	0,25mm	0,32mm	0,40mm	0,25mm	0,35mm	0,55mm	0,25mm	0,45mm	0,65mm

2. Ap1 and vc corrections depend on L/D ratio

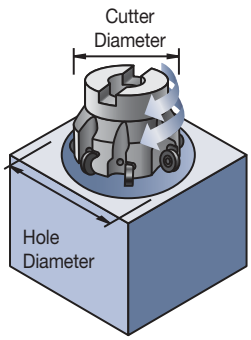
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:



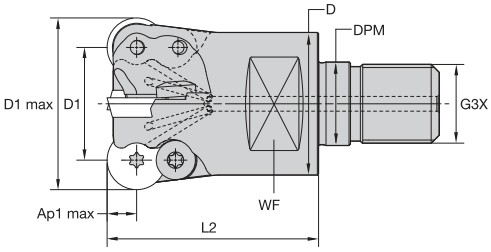
L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65–75%	10–15%
>4	80–95%	20–40%

Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
20	22mm	30mm	2,1mm	20°	4mm
22	24mm	34mm	2,1mm	20°	2,4mm
25	33mm	40mm	3,2mm	8°	1,7mm
28	36mm	46mm	5mm	15°	3,8mm
30	40,6mm	50mm	5mm	10°	3,4mm
35	50,7mm	60mm	5mm	8,5°	3,4mm
40	60,5mm	70mm	5mm	7,2°	3,6mm
42	64,5mm	74mm	5mm	5,8°	3,6mm
50	80,3mm	90mm	5mm	5,2°	4mm
52	85,8mm	94mm	5mm	3°	2,2mm



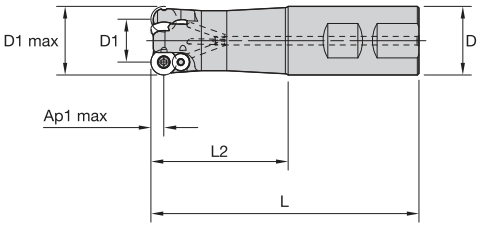
M170 • Screw-On RD12T3.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930954	M170D035Z03M16RD12	35	23	29	17,0	M16	43	22	6,0	3	11.0	9900	Yes	0,22
3930956	M170D035Z04M16RD12	35	23	29	17,0	M16	43	22	6,0	4	10.5	9900	Yes	0,21

NOTE: All spare parts except the insert screws must be ordered separately.

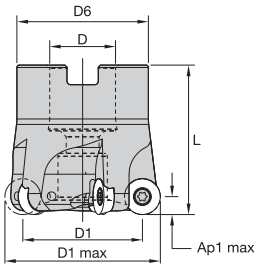
M170 • Weldon® Shank RD12T3.. • Metric



order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930960	M170D032Z03B32RD12	32	20	32	125	64	6,0	3	12.0	9500	Yes	0,63

NOTE: All spare parts except the insert screws must be ordered separately.

M170 • Shell Mills RD12T3.. • Metric



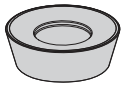
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930968	M170D040Z04RD12	40	28	16	37	40	6,0	4	9.3	7000	Yes	0,22
3930970	M170D050Z05RD12	50	38	22	44	40	6,0	5	6.1	7950	Yes	0,32
3930972	M170D052Z05RD12	52	40	22	44	50	6,0	5	4.5	7600	Yes	0,44
3930975	M170D063Z06RD12	63	51	22	44	40	6,0	6	4.5	6300	Yes	0,45
3930976	M170D066Z06RD12	66	54	27	60	50	6,0	6	4.5	6030	Yes	0,81
3930979	M170D080Z07RD12	80	68	27	60	50	6,0	7	3.5	4900	Yes	0,97
3930981	M170D100Z08RD12	100	88	32	80	55	6,0	8	2.2	3900	Yes	1,95

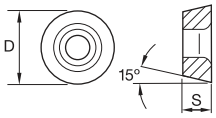
NOTE: Socket-head cap screw, socket-head cap screw with coolant groove, low-head cap screw with coolant groove, and Torx driver must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M170 • RDPX-MM • RD12T3..



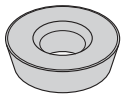


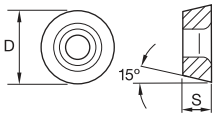
● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX12T3M0SNMM	12,00	3,97	0,13	–	3959624	3959623

M170 • RDPX-MH • RD12T3..





● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX12T3M0SNMH	12,00	3,97	0,17	3959622	3959621	3959620

M170 • RD12T3.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	MM	TN6525	**MM**	**TN6525**	MM	TN6540
P3–P4	MH	TN2505	**MH**	**TN6525**	MH	TN6540
P5–P6	MH	TN2505	**MH**	**TN6525**	MH	TN6540
M1–M2	–	–	**MM**	**TN6525**	MM	TN6540
M3	–	–	**MM**	**TN6525**	MM	TN6540
K1–K2	MH	TN2505	**MH**	**TN2505**	MH	TN6525
K3	MH	TN2505	**MH**	**TN2505**	MH	TN6525
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**MM**	**TN6540**	–	–
S3	–	–	**MM**	**TN6540**	–	–
S4	–	–	**MM**	**TN6540**	–	–
H1	MH	TN2505	**MH**	**TN2505**	–	–

M170 • RD12T3.. • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540		
P	1	550	**420**	360	410	**320**	280	360	**280**	240
	2	320	**240**	205	320	**250**	215	250	**190**	170
	3	320	**240**	205	280	**215**	185	215	**170**	140
	4	–	**–**	–	235	**170**	145	180	**130**	110
	5	–	**–**	–	310	**235**	200	240	**180**	150
	6	–	**–**	–	205	**160**	130	160	**120**	100
M	1	–	**–**	–	190	**120**	80	130	**80**	60
	2	–	**–**	–	120	**80**	50	80	**50**	40
	3	–	**–**	–	125	**80**	55	85	**50**	40
K	1	400	**300**	250	275	**245**	220	220	**205**	180
	2	540	**365**	280	215	**190**	180	175	**155**	140
	3	310	**190**	155	180	**160**	145	155	**145**	125
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10
	3	–	**–**	–	–	**–**	–	70	**40**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25
H	1	175	**140**	95	–	**–**	–	–	**–**	–
	2	175	**140**	95	–	**–**	–	–	**–**	–
	3	140	**115**	80	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M170 • RD12T3.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 6,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,33	**0,48**	0,76	0,24	**0,35**	0,54	0,18	**0,26**	0,41	0,16	**0,23**	0,35	0,14	**0,21**	0,33	MM
MH	0,35	**0,70**	1,17	0,25	**0,50**	0,84	0,19	**0,38**	0,63	0,16	**0,33**	0,55	0,15	**0,30**	0,50	MH

At 3,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,38	**0,56**	0,88	0,28	**0,40**	0,63	0,21	**0,30**	0,47	0,18	**0,26**	0,41	0,17	**0,24**	0,38	MM
MH	0,40	**0,81**	1,36	0,29	**0,58**	0,97	0,22	**0,43**	0,72	0,19	**0,38**	0,63	0,17	**0,35**	0,58	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,44	**0,65**	1,02	0,32	**0,47**	0,73	0,24	**0,35**	0,55	0,21	**0,30**	0,48	0,19	**0,28**	0,44	MM
MH	0,47	**0,94**	1,59	0,34	**0,68**	1,13	0,25	**0,50**	0,84	0,22	**0,44**	0,73	0,20	**0,40**	0,67	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,60	**0,88**	1,38	0,43	**0,63**	0,99	0,32	**0,47**	0,74	0,28	**0,41**	0,64	0,26	**0,38**	0,59	MM
MH	0,63	**1,28**	2,16	0,45	**0,91**	1,53	0,34	**0,68**	1,14	0,30	**0,59**	0,99	0,27	**0,54**	0,90	MH

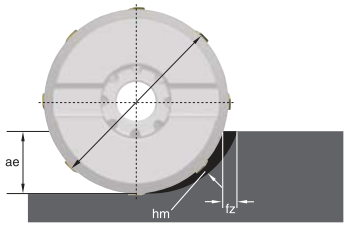
NOTE: Use "Light Machining" value as starting feed rate.

WIDIA™ Indexable Milling Additional Application Advice RD12T3.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

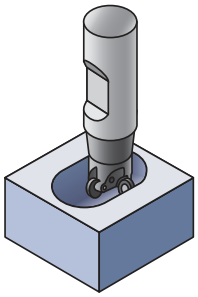
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 1mm	1,01mm	0,77mm	0,63mm	0,55mm	0,49mm	0,35mm
Ap1 = 2mm	0,77mm	0,55mm	0,45mm	0,39mm	0,35mm	0,24mm
Ap1 = 3mm	0,63mm	0,45mm	0,37mm	0,32mm	0,28mm	0,20mm
Ap1 = 4mm	0,55mm	0,39mm	0,32mm	0,27mm	0,24mm	0,17mm
Ap1 = 5mm	0,49mm	0,35mm	0,28mm	0,24mm	0,22mm	0,15mm
Ap1 = 6mm	0,45mm	0,32mm	0,26mm	0,22mm	0,20mm	0,14mm

Example application highlighted.



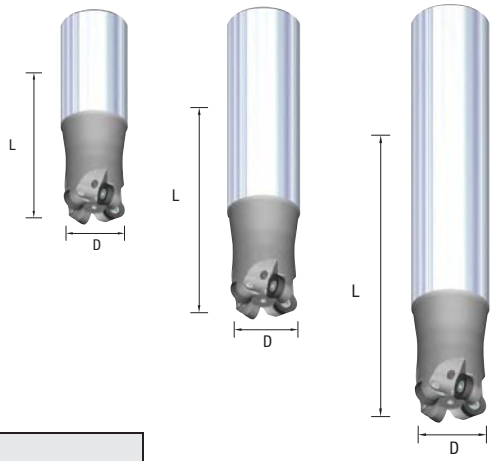
Example Cutting Conditions for RD..10... Insert in Pocketing, L/D ratio = 2 x D:

insert = RDPX12T3M0SN			TN2505			TN6525			TN6540		
			feed per tooth fz (mm)/ae>50%								
			min	med	max	min	med	max	min	med	max
Edge Geometry MM	ae>50%	Recommended starting Ap1 = 2mm	–	–	–	0,24mm	0,30mm	0,50mm	0,24mm	0,40mm	0,60mm
Edge Geometry MH	ae>50%	Recommended starting Ap1 = 2mm	0,24mm	0,30mm	0,50mm	0,24mm	0,40mm	0,65mm	0,24mm	0,50mm	0,70mm

2. Ap1 and vc corrections depend on L/D ratio

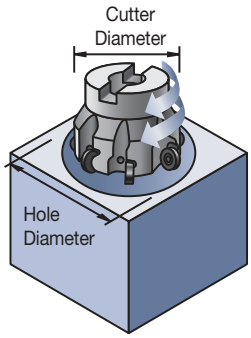
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65–75%	10–15%
>4	80–95%	20–40%

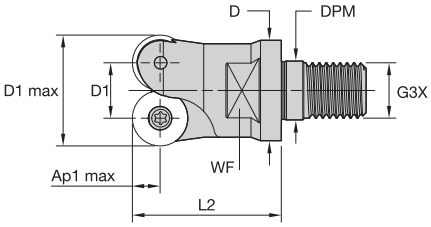


Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
24	25,6mm	36mm	1,3mm	15°	3mm
32	40,6mm	52mm	5,3mm	12°	4,4mm
35	46,9mm	58mm	6mm	11°	3,9mm
40	57,4mm	68mm	6mm	9.3°	3,3mm
42	61,2mm	72mm	6mm	7.2°	3,5mm
50	77,4mm	88mm	6mm	6.1°	3,5mm
52	81,3mm	92mm	6mm	4.5°	3,2mm
63	102,4mm	114mm	6mm	4.5°	4,6mm
66	108,5mm	120mm	6mm	4.5°	4,4mm
80	136,5mm	148mm	6mm	3.5°	4,2mm
100	176,5mm	188mm	6mm	2.2°	4,2mm



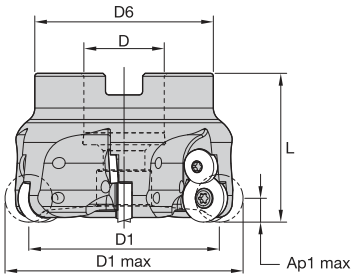
M170 • Screw-On RD1604.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926601	M170D032Z02M16RD16	32	16	29	17,0	M16	43	22	8,0	2	20.0	9950	Yes	0,17

NOTE: All spare parts except the insert screws must be ordered separately.

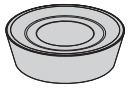
M170 • Shell Mills RD1604.. • Metric

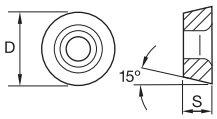


order number	catalogue number	D1 max	D1	D	D6	L	L1	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926602	M170D050Z04RD16	50	34	22	44	40	40	8,0	4	8.5	7900	Yes	0,28
3934623	M170D052Z04RD16	52	36	22	44	50	50	8,0	4	8.2	7650	Yes	0,36
3934624	M170D063Z05RD16	63	47	22	44	40	40	8,0	5	5.5	5300	Yes	0,39
3934626	M170D080Z06RD16	80	64	27	60	50	50	8,0	6	3.0	4900	Yes	1,06
3934629	M170D125Z08RD16	125	109	40	90	60	60	8,0	8	2.2	3200	Yes	2,90

NOTE: All spare parts except the insert screws and clamp screws must be ordered separately.

RDPX-MM • RD1604..



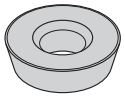


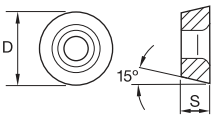
● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1604M0SNMM	16,00	4,76	0,14	–	–	3960515

RDPX-MH • RD1604..





● first choice
○ alternate choice

P	○	●	●
M		○	●
K	●	○	○
N			
S			●
H	●		

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1604M0SNMH	16,00	4,76	0,22	3960514	3960513	–

Insert Selection Guide • M170 • RD16 • Metric

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	MM	TN6525	**MM**	**TN6525**	MM	TN6540
P3–P4	MH	TN2505	**MH**	**TN6525**	MH	TN6540
P5–P6	MH	TN2505	**MH**	**TN6525**	MH	TN6540
M1–M2	–	–	**MM**	**TN6525**	MM	TN6540
M3	–	–	**MM**	**TN6525**	MM	TN6540
K1–K2	MH	TN2505	**MH**	**TN2505**	MH	TN6525
K3	MH	TN2505	**MH**	**TN2505**	MH	TN6525
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**MM**	**TN6540**	–	–
S3	–	–	**MM**	**TN6540**	–	–
S4	–	–	**MM**	**TN6540**	–	–
H1	MH	TN2505	**MH**	**TN2505**	–	–

Recommended Starting Speeds • M170 • RD1604 • Metric

Material Group		TN2505			TN6525			TN6540		
P	1	550	**420**	360	410	**320**	280	360	**280**	240
	2	320	**240**	205	320	**250**	215	250	**190**	170
	3	320	**240**	205	280	**215**	185	215	**170**	140
	4	–	**–**	–	235	**170**	145	180	**130**	110
	5	–	**–**	–	310	**235**	200	240	**180**	150
	6	–	**–**	–	205	**160**	130	160	**120**	100
M	1	–	**–**	–	190	**120**	80	130	**80**	60
	2	–	**–**	–	120	**80**	50	80	**50**	40
	3	–	**–**	–	125	**80**	55	85	**50**	40
K	1	400	**300**	250	275	**245**	220	220	**205**	180
	2	540	**365**	280	215	**190**	180	175	**155**	140
	3	310	**190**	155	180	**160**	145	155	**145**	125
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10
	3	–	**–**	–	–	**–**	–	70	**40**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25
H	1	175	**140**	95	–	**–**	–	–	**–**	–
	2	175	**140**	95	–	**–**	–	–	**–**	–
	3	140	**115**	80	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds • M170 • RD16 • Metric

Light Machining	General Purpose	Heavy Machining

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,39	**0,52**	0,82	0,28	**0,37**	0,59	0,21	**0,28**	0,44	0,18	**0,24**	0,38	0,17	**0,22**	0,35	MM
MH	0,51	**0,70**	1,17	0,37	**0,50**	0,84	0,28	**0,38**	0,63	0,24	**0,33**	0,55	0,22	**0,30**	0,50	MH

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,45	**0,60**	0,94	0,32	**0,43**	0,68	0,24	**0,32**	0,51	0,21	**0,28**	0,44	0,19	**0,26**	0,40	MM
MH	0,59	**0,81**	1,36	0,43	**0,58**	0,97	0,32	**0,43**	0,72	0,28	**0,38**	0,63	0,25	**0,35**	0,58	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,59	**0,79**	1,24	0,43	**0,57**	0,89	0,32	**0,42**	0,66	0,28	**0,37**	0,58	0,25	**0,34**	0,53	MM
MH	0,77	**1,06**	1,79	0,56	**0,76**	1,28	0,42	**0,57**	0,95	0,36	**0,50**	0,83	0,33	**0,45**	0,76	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,81	**1,08**	1,71	0,58	**0,78**	1,22	0,43	**0,58**	0,91	0,38	**0,51**	0,79	0,35	**0,46**	0,72	MM
MH	1,06	**1,46**	2,48	0,76	**1,04**	1,75	0,57	**0,78**	1,30	0,50	**0,68**	1,13	0,45	**0,62**	1,03	MH

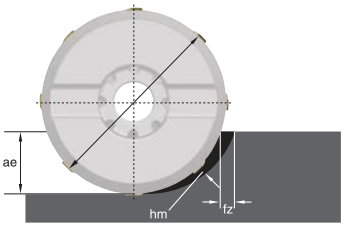
NOTE: Use "Light Machining" value as starting feed rate.

WIDIA Indexable Milling Additional Application Advice RD1604.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

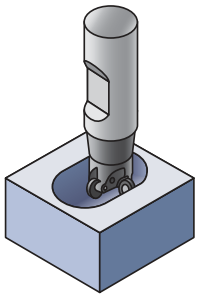
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 1mm	1,52mm	1,07mm	0,88mm	0,76mm	0,68mm	0,48mm
Ap1 = 2mm	1,07mm	0,76mm	0,62mm	0,54mm	0,48mm	0,34mm
Ap1 = 3mm	0,88mm	0,62mm	0,51mm	0,44mm	0,39mm	0,28mm
Ap1 = 4mm	0,76mm	0,54mm	0,44mm	0,38mm	0,34mm	0,24mm
Ap1 = 5mm	0,62mm	0,44mm	0,36mm	0,31mm	0,26mm	0,20mm
Ap1 = 6mm	0,54mm	0,38mm	0,31mm	0,27mm	0,24mm	0,17mm

Example application highlighted.



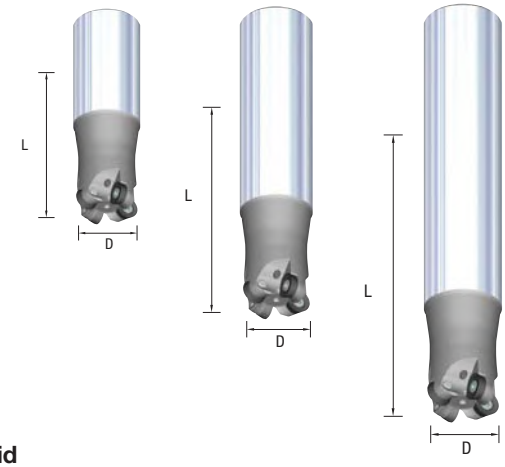
Example Cutting Conditions for iC16mm... Insert in Pocketing, up to 3 L/D approximately:

insert = RDPX1604M0SN			TN2505			TN6525			TN6540		
			feed per tooth fz (mm)/ae>50%								
			min	med	max	min	med	max	min	med	max
Edge Geometry MM	ae>50%	Recommended starting Ap1 = 3mm	–	–	–	0,28mm	0,45mm	0,65mm	0,28mm	0,50mm	0,70mm
Edge Geometry MH	ae>50%	Recommended starting Ap1 = 3mm	0,28mm	0,35mm	0,50mm	0,28mm	0,50mm	0,75mm	0,28mm	0,60mm	0,80mm

2. Ap1 and vc corrections depend on L/D ratio

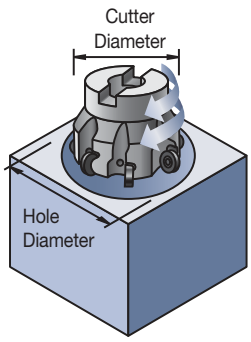
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

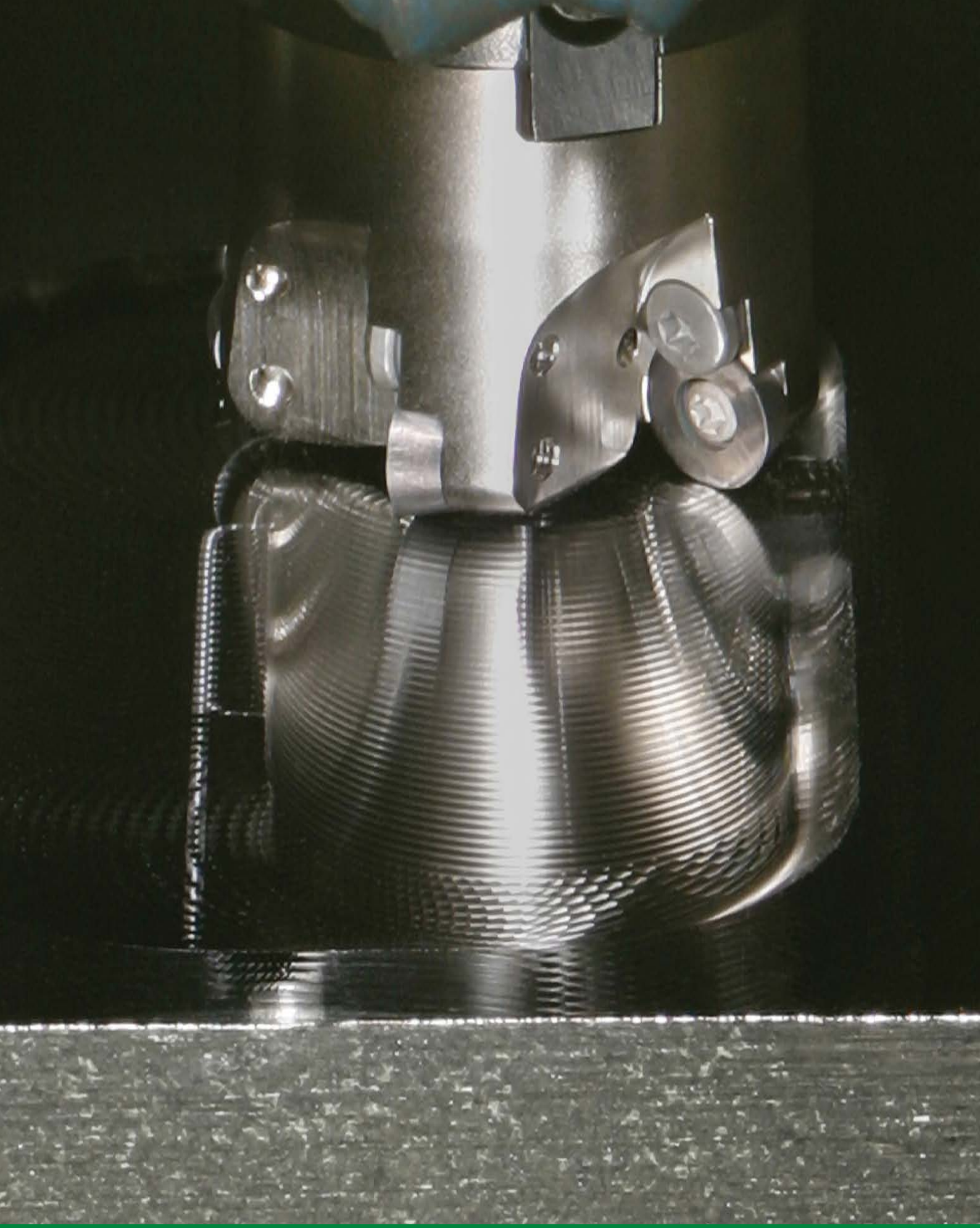
L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65–75%	10–15%
>4	80–95%	20–40%



Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
32	36mm	48mm	3mm	20°	3mm
50	69mm	84mm	8mm	9,5°	4,8mm
52	73mm	88mm	8mm	8,2°	5mm
63	95mm	110mm	8mm	5,5°	4,7mm
66	101mm	120mm	8mm	4°	4,2mm
80	129mm	144mm	8mm	3°	4,1mm
100	169mm	184mm	8mm	2,4°	4,6mm
125	219mm	234mm	8mm	2,2°	4,4mm





widia.com

WIDIA™

M100™ Series

M100 IC06, M100 IC10, M100 IC12, M100 IC16, M100 IC18 Copy Mills

The M100 copy mill is a reliable multipurpose solution for copy milling, face milling, helical interpolation, and roughing. The strong and rigid body design paired with the thick inserts ensures consistent results in even the most demanding operations.

Thick inserts paired with the rigid body design provide rigidity and consistency.

Anti-rotation systems in the larger iC inserts provide stability to allow for higher depth of cuts.

Large chip gashes and through tool coolant capabilities provide smooth and increased chip evacuation.

The M100 copy mill is equipped with thick inserts, rigid body design, and anti-rotation systems to stay engaged with the workpiece in high depth of cuts.

INSERT OFFERING

08mm iC
RD Insert Type
Ground and PSTS

10mm iC
RD Insert Type
Ground and PSTS

12mm iC
RD Insert Type
Anti-Rotation Feature
Ground and PSTS

16mm iC
RD Insert Type
Anti-Rotation Feature
Ground and PSTS

16mm iC
RC Insert Type
Anti-Rotation Feature
Ground and PSTS

PROFILING AND COPY APPLICATIONS

PRODUCT

SERIES

M100™

DIAMETER RANGE

16–160mm

SHANK TYPES

Shell Mills
Weldon® End Mills
Screw-On End Mills

INDUSTRY

GENERAL ENGINEERING

ENERGY

TRANSPORTATION

APPLICATIONS

FACE MILLING

HELICAL MILLING/ POCKET MILLING

3D PROFILING

POCKETING

RAMPING BLANK

SIDE MILLING/ SHOULDER MILLING: BALL NOSE

SLOTTING

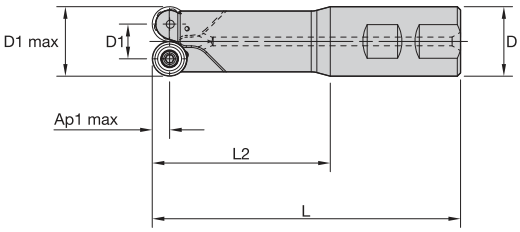
CONSISTENCY

Thick inserts combined with the rigid body provide a strong foundation for consistent results.

STABILITY

Anti-rotation systems in the larger iC inserts provide a sure fit for stability in high depth of cuts.

M100 • Weldon® Shank RD0802..• Metric



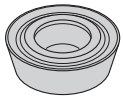
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021333	**12391010600**	16	8	16	90	42	4,0	2	7.5	28000	Yes	0,10
2021334	**12391011000**	16	8	20	132	82	4,0	2	7.5	28000	Yes	0,20
2021335	**12391011400**	16	8	25	183	127	4,0	2	7.5	28000	Yes	0,40

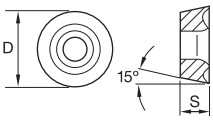
NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • RDMT-M0T • RD0802..



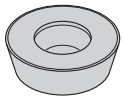


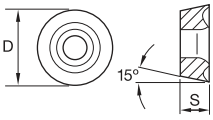
● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	cutting edges	D	S	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT0802M0T	1	8,00	2,38	'	'	'	'	'	6901186	'	'
RDMT1003M0T	1	10,00	3,18	'	'	'	'	'	6901187	'	'

M100 • RDMW-M0 / -M0T • RD0802..





● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	cutting edges	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW0802M0	1	8,00	2,38	0,09	2012566	'	'	'	'	'	'	'
RDMW0802M0T	1	8,00	2,38	0,09	'	'	3353278	'	'	'	'	'

M100 • RD08 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	RDMT-T	WP35CM	**RDMT-T**	**WP35CM**	RDMT-T	WP35CM
P3–P4	RDMT-T	WP35CM	**RDMW-T**	**TN6540**	RDMW-T	TN6540
P5–P6	RDMT-T	WP35CM	**RDMT-T**	**WP35CM**	RDMT-T	WP35CM
M1–M2	RDMT-T	WP35CM	**RDMT-T**	**WP35CM**	RDMT-T	WP35CM
M3	RDMT-T	WP35CM	**RDMT-T**	**WP35CM**	RDMT-T	WP35CM
K1–K2	–	–	**RDMT-T**	**WP35CM**	RDMT-T	WP35CM
K3	–	–	**RDMT-T**	**WP35CM**	RDMT-T	WP35CM

M100 • RD08 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	–	–	–	410	**320**	280	360	**280**	240	230	**200**	190	–	–	–	455	**395**	370	–	–	–	–	–	–
	2	–	–	–	320	**250**	215	250	**190**	170	195	**170**	140	–	–	–	280	**255**	230	–	–	–	–	–	–
	3	–	–	–	280	**215**	185	215	**170**	140	180	**150**	125	–	–	–	255	**230**	205	–	–	–	–	–	–
	4	–	–	–	235	**170**	145	180	**130**	110	160	**130**	105	–	–	–	190	**175**	160	–	–	–	–	–	–
	5	–	–	–	310	**235**	200	240	**180**	150	–	–	–	–	–	–	260	**230**	210	–	–	–	205	**175**	145
	6	–	–	–	205	**160**	130	160	**120**	100	–	–	–	–	–	–	160	**135**	110	–	–	–	180	**130**	95
M	1	–	–	–	190	**120**	80	130	**80**	60	–	–	–	–	–	–	205	**185**	155	270	**240**	220	250	**205**	170
	2	–	–	–	120	**80**	50	80	**50**	40	–	–	–	–	–	–	185	**160**	140	245	**215**	175	215	**175**	145
	3	–	–	–	125	**80**	55	85	**50**	40	–	–	–	–	–	–	145	**130**	115	185	**160**	125	175	**130**	100
K	1	120	**90**	75	275	**245**	220	220	**205**	180	–	–	–	505	**460**	410	295	**265**	240	–	–	–	–	–	–
	2	125	**100**	70	215	**190**	180	175	**155**	140	–	–	–	400	**355**	330	235	**210**	190	–	–	–	–	–	–
	3	130	**95**	60	180	**160**	145	155	**145**	125	–	–	–	335	**300**	275	195	**175**	160	–	–	–	–	–	–
N	1	900	**600**	500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**35**	30	–	–	–	–	–	–	–	–	–	55	**50**	35	50	**40**	30
	2	–	–	–	–	–	–	25	**20**	10	–	–	–	–	–	–	–	–	–	55	**50**	35	50	**40**	30
	3	–	–	–	–	–	–	70	**40**	30	–	–	–	–	–	–	–	–	–	65	**55**	35	60	**50**	30
	4	–	–	–	–	–	–	60	**30**	25	–	–	–	–	–	–	66	**50**	33	100	**70**	50	70	**60**	35
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M100 • RD08 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 4,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDMW-	0,19	**0,29**	0,42	0,14	**0,21**	0,30	0,10	**0,16**	0,23	0,09	**0,14**	0,29	0,08	**0,13**	0,18	RDMW-
RDHT-T	0,23	**0,31**	0,63	0,17	**0,23**	0,45	0,13	**0,17**	0,34	0,11	**0,15**	0,29	0,10	**0,14**	0,27	RDHT-T
RDMT-T	0,23	**0,31**	0,63	0,17	**0,23**	0,45	0,13	**0,17**	0,34	0,11	**0,15**	0,29	0,10	**0,14**	0,27	RDMT-T
RDMW-T	0,23	**0,42**	0,73	0,17	**0,30**	0,53	0,13	**0,23**	0,39	0,11	**0,20**	0,34	0,10	**0,18**	0,32	RDMW-T

At 2,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDMW-	0,22	**0,34**	0,48	0,16	**0,24**	0,35	0,12	**0,18**	0,26	0,10	**0,16**	0,23	0,09	**0,15**	0,21	RDMW-
RDHT-T	0,27	**0,36**	0,72	0,19	**0,26**	0,52	0,14	**0,20**	0,39	0,13	**0,17**	0,34	0,12	**0,16**	0,31	RDHT-T
RDMT-T	0,27	**0,36**	0,72	0,19	**0,26**	0,52	0,14	**0,20**	0,39	0,13	**0,17**	0,34	0,12	**0,16**	0,31	RDMT-T
RDMW-T	0,27	**0,48**	0,85	0,19	**0,35**	0,61	0,14	**0,26**	0,46	0,13	**0,23**	0,40	0,12	**0,21**	0,36	RDMW-T

At 1,00 Axial Depth of Cut (ap)

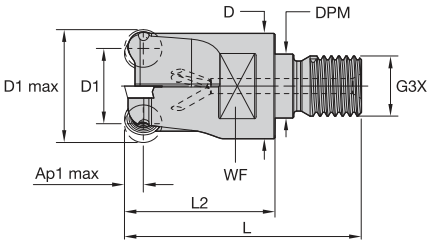
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDMW-	0,28	**0,44**	0,63	0,20	**0,32**	0,46	0,15	**0,24**	0,34	0,13	**0,21**	0,30	0,12	**0,19**	0,27	RDMW-
RDHT-T	0,35	**0,47**	0,95	0,25	**0,34**	0,69	0,19	**0,26**	0,51	0,17	**0,22**	0,45	0,15	**0,20**	0,41	RDHT-T
RDMT-T	0,35	**0,47**	0,95	0,25	**0,34**	0,69	0,19	**0,26**	0,51	0,17	**0,22**	0,45	0,15	**0,20**	0,41	RDMT-T
RDMW-T	0,35	**0,63**	1,12	0,25	**0,46**	0,80	0,19	**0,34**	0,60	0,17	**0,30**	0,52	0,15	**0,27**	0,48	RDMW-T

At 0,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDMW-	0,39	**0,60**	0,87	0,28	**0,44**	0,62	0,21	**0,33**	0,47	0,18	**0,28**	0,41	0,17	**0,26**	0,37	RDMW-
RDHT-T	0,48	**0,65**	1,31	0,35	**0,47**	0,94	0,26	**0,35**	0,70	0,23	**0,30**	0,61	0,21	**0,28**	0,56	RDHT-T
RDMT-T	0,48	**0,65**	1,31	0,35	**0,47**	0,94	0,26	**0,35**	0,70	0,23	**0,30**	0,61	0,21	**0,28**	0,56	RDMT-T
RDMW-T	0,48	**0,87**	1,54	0,35	**0,62**	1,10	0,26	**0,47**	0,82	0,23	**0,41**	0,71	0,21	**0,37**	0,65	RDMW-T

NOTE: Use "Light Machining" value as starting feed rate.

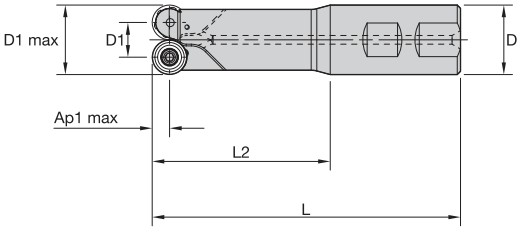
M100 • Screw-On RD1003.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021375	**12391050400**	25	15	22	12,5	M12	52	30	19	5,0	2	15.8	22000	Yes	0,10
2021376	**12391050600**	30	20	28	17,0	M16	63	40	22	5,0	3	10.3	20000	Yes	0,20

NOTE: All spare parts except the insert screws must be ordered separately.

M100 • Weldon® Shank RD1003.. • Metric



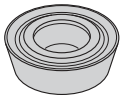
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021336	**12391011600**	20	10	20	92	42	5,0	2	7.8	25000	Yes	0,20
2021337	**12391012000**	20	10	25	138	82	5,0	2	8.8	25000	Yes	0,40
2021339	**12391012800**	26	16	32	142	82	5,0	2	13.5	22000	Yes	0,60
2021340	**12391013200**	26	16	32	187	127	5,0	2	14.3	22000	Yes	0,90

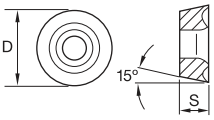
NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • RDMT-M0T • RD1003..



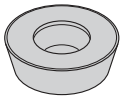


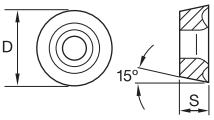
● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	cutting edges	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT1003M0	1	10,00	3,18	0,14	2012538	-	-	-	-	-	-	-
RDMT1003M0T	1	10,00	3,18	0,14	-	2957429	2957428	-	-	-	-	-

M100 • RDMW-M0 / -M0T • RD1003..





● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	cutting edges	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW1003M0T	1	10,00	3,18	0,14	-	-	3353279	-	-	-	-	-
RDMW1003M0	1	10,00	3,18	–	-	-	-	-	6724747	-	-	-

M100 • RD10 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	RDMT-T	TN6525	**RDMT-T**	**TN6540**	RDMW-T	TN6540
P3–P4	RDMT-T	TN6525	**RDMW-T**	**TN6540**	RDMW-T	TN6540
P5–P6	RDMT-T	TN6525	**RDMW-T**	**TN6540**	RDMW-T	TN6540
M1–M2	RDMT-T	TN6540	**RDMT-T**	**TN6540**	RDMT-T	TN6540
M3	RDMT-T	TN6540	**RDMT-T**	**TN6540**	RDMT-T	TN6540
K1–K2	RDMW-MH	TN2510	**RDMW-MH**	**TN2510**	RDMW	WK15CM
K3	RDMW-MH	TN2510	**RDMW-MH**	**TN2510**	RDMW	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**RDMT-T**	**TN6540**	–	–
S3	–	–	**RDMT-T**	**TN6540**	–	–
S4	–	–	**RDMT-T**	**TN6540**	RDMT-T	TN6540
H1	RDMW-MH	TN2510	**RDMW-MH**	**TN2510**	–	–

M100 • RD10 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	–	–	–	410	**320**	280	360	**280**	240	230	**200**	190	–	–	–	455	**395**	370	–	–	–	–	–	–
	2	–	–	–	320	**250**	215	250	**190**	170	195	**170**	140	–	–	–	280	**255**	230	–	–	–	–	–	–
	3	–	–	–	280	**215**	185	215	**170**	140	180	**150**	125	–	–	–	255	**230**	205	–	–	–	–	–	–
	4	–	–	–	235	**170**	145	180	**130**	110	160	**130**	105	–	–	–	190	**175**	160	–	–	–	–	–	–
	5	–	–	–	310	**235**	200	240	**180**	150	–	–	–	–	–	–	260	**230**	210	–	–	–	205	**175**	145
	6	–	–	–	205	**160**	130	160	**120**	100	–	–	–	–	–	–	160	**135**	110	–	–	–	180	**130**	95
M	1	–	–	–	190	**120**	80	130	**80**	60	–	–	–	–	–	–	205	**185**	155	270	**240**	220	250	**205**	170
	2	–	–	–	120	**80**	50	80	**50**	40	–	–	–	–	–	–	185	**160**	140	245	**215**	175	215	**175**	145
	3	–	–	–	125	**80**	55	85	**50**	40	–	–	–	–	–	–	145	**130**	115	185	**160**	125	175	**130**	100
K	1	120	**90**	75	275	**245**	220	220	**205**	180	–	–	–	505	**460**	410	295	**265**	240	–	–	–	–	–	–
	2	125	**100**	70	215	**190**	180	175	**155**	140	–	–	–	400	**355**	330	235	**210**	190	–	–	–	–	–	–
	3	130	**95**	60	180	**160**	145	155	**145**	125	–	–	–	335	**300**	275	195	**175**	160	–	–	–	–	–	–
N	1	900	**600**	500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	685	**465**	385	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	450	**280**	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**35**	30	–	–	–	–	–	–	–	–	–	55	**50**	35	50	**40**	30
	2	–	–	–	–	–	–	25	**20**	10	–	–	–	–	–	–	–	–	–	55	**50**	35	50	**40**	30
	3	–	–	–	–	–	–	70	**40**	30	–	–	–	–	–	–	–	–	–	65	**55**	35	60	**50**	30
	4	–	–	–	–	–	–	60	**30**	25	–	–	–	–	–	–	66	**50**	33	100	**70**	50	70	**60**	35
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M100 • RD10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-T	0,23	**0,39**	0,65	0,17	**0,28**	0,47	0,13	**0,21**	0,35	0,11	**0,18**	0,31	0,10	**0,17**	0,28	RDHT-T
RDHW-MH	0,23	**0,42**	0,88	0,17	**0,30**	0,63	0,13	**0,23**	0,47	0,11	**0,20**	0,41	0,10	**0,18**	0,38	RDHW-MH
RDMT-T	0,23	**0,39**	0,65	0,17	**0,28**	0,47	0,13	**0,21**	0,35	0,11	**0,18**	0,31	0,10	**0,17**	0,28	RDMT-T
RDMW	0,23	**0,21**	0,61	0,17	**0,15**	0,44	0,13	**0,11**	0,33	0,11	**0,10**	0,28	0,10	**0,09**	0,26	RDMW
RDMW-T	0,23	**0,57**	0,88	0,17	**0,41**	0,63	0,13	**0,31**	0,47	0,11	**0,27**	0,41	0,10	**0,25**	0,38	RDMW-T

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-T	0,29	**0,49**	0,82	0,21	**0,35**	0,59	0,16	**0,26**	0,44	0,14	**0,23**	0,38	0,13	**0,21**	0,35	RDHT-T
RDHW-MH	0,29	**0,53**	1,11	0,21	**0,38**	0,79	0,16	**0,28**	0,59	0,14	**0,25**	0,52	0,13	**0,23**	0,47	RDHW-MH
RDMT-T	0,29	**0,49**	0,82	0,21	**0,35**	0,59	0,16	**0,26**	0,44	0,14	**0,23**	0,38	0,13	**0,21**	0,35	RDMT-T
RDMW	0,29	**0,26**	0,76	0,21	**0,19**	0,55	0,16	**0,14**	0,41	0,14	**0,12**	0,36	0,13	**0,11**	0,33	RDMW
RDMW-T	0,29	**0,71**	1,11	0,21	**0,51**	0,79	0,16	**0,38**	0,59	0,14	**0,33**	0,52	0,13	**0,31**	0,47	RDMW-T

At 1,00mm Axial Depth of Cut (ap)

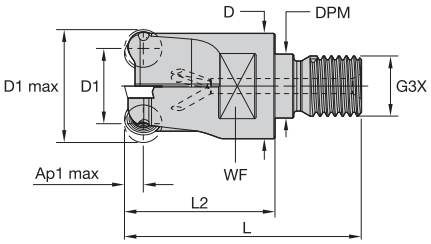
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-T	0,39	**0,65**	1,09	0,28	**0,47**	0,78	0,21	**0,35**	0,58	0,18	**0,31**	0,51	0,17	**0,28**	0,47	RDHT-T
RDHW-MH	0,39	**0,71**	1,49	0,28	**0,51**	1,06	0,21	**0,38**	0,79	0,18	**0,33**	0,69	0,17	**0,30**	0,63	RDHW-MH
RDMT-T	0,39	**0,65**	1,09	0,28	**0,47**	0,78	0,21	**0,35**	0,58	0,18	**0,31**	0,51	0,17	**0,28**	0,47	RDMT-T
RDMW	0,39	**0,35**	1,02	0,28	**0,25**	0,73	0,21	**0,19**	0,55	0,18	**0,16**	0,48	0,17	**0,15**	0,44	RDMW
RDMW-T	0,39	**0,95**	1,49	0,28	**0,69**	1,06	0,21	**0,51**	0,79	0,18	**0,45**	0,69	0,17	**0,41**	0,63	RDMW-T

At 0,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-T	0,53	**0,90**	1,52	0,38	**0,65**	1,08	0,29	**0,48**	0,81	0,25	**0,42**	0,70	0,23	**0,39**	0,64	RDHT-T
RDHW-MH	0,53	**0,98**	2,07	0,38	**0,70**	1,47	0,29	**0,52**	1,09	0,25	**0,46**	0,95	0,23	**0,42**	0,87	RDHW-MH
RDMT-T	0,53	**0,90**	1,52	0,38	**0,65**	1,08	0,29	**0,48**	0,81	0,25	**0,42**	0,70	0,23	**0,39**	0,64	RDMT-T
RDMW	0,53	**0,48**	1,41	0,38	**0,35**	1,01	0,29	**0,26**	0,75	0,25	**0,23**	0,65	0,23	**0,21**	0,60	RDMW
RDMW-T	0,53	**1,32**	2,07	0,38	**0,95**	1,47	0,29	**0,70**	1,09	0,25	**0,61**	0,95	0,23	**0,56**	0,87	RDMW-T

NOTE: Use "Light Machining" value as starting feed rate.

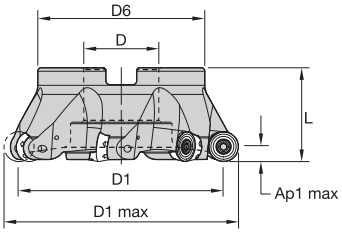
M100 • Screw-On RD1204... • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021374	**12391050200**	24	12	22	12,5	M12	52	30	19	6,0	2	10.0	23000	Yes	0,10
2021378	**12391051000**	35	23	28	17,0	M16	63	40	22	6,0	3	10.8	19000	Yes	0,20
2021379	**12391051200**	40	28	28	17,0	M16	63	40	22	6,0	4	8.3	17000	Yes	0,30

NOTE: All spare parts except the insert screws must be ordered separately.

M100 • Shell Mills RD1204... • Metric



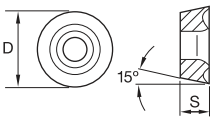
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021342	**12391020000**	50	38	22	40	40	6,0	4	6.8	15000	Yes	0,20
2021361	**12391024000**	52	40	22	40	40	6,0	4	6.5	15000	Yes	0,20
2021343	**12391020200**	63	51	27	48	40	6,0	5	4.5	14000	Yes	0,30
2021344	**12391020400**	80	68	27	60	50	6,0	6	3.5	12000	Yes	0,90
2021345	**12391020600**	100	88	32	78	50	6,0	6	2.5	11000	No	1,20

NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • RDMT-TX • RD1204..

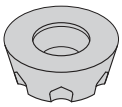


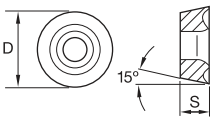
● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT1204M0TX	6	12,00	4,76	0,15	'	2957430	2957432	2012546	'	'	5520247	'
RDMT1204M0TX	6	12,00	4,76	–	'	'	'	'	6724748	6901188	'	'

M100 • RDMW-TX • RD1204..



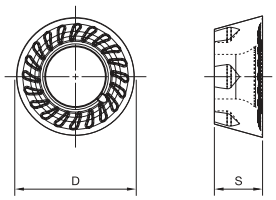


● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW1204M0TX	6	12,00	4,76	0,15	'	'	3353281	2012600	5427441	'	'	'
RDMW1204M0TX	6	12,00	4,76	–	'	'	'	'	'	6901190	'	'

M100 • RDPT-MMX • RD1204..



● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDPT1204M0SMMX	6	12,00	4,76	0,18	'	'	5176974	'	'	'	'	6412897
RDPT1204M0SMMX4	4	12,00	4,76	–	'	'	'	'	'	'	'	6412898
RDPT1204M0SMMX	6	12,00	4,76	–	'	'	'	'	'	6901783	'	'

M100 • RD12 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	RDMT-TX	WP35CM	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
P3–P4	RDMT-TX	WP35CM	**RDMW-TX**	**TN6540**	RDMW-TX	TN6540
P5–P6	RDMT-TX	WP35CM	**RDPT-MMX**	**WP35CM**	RDPT-MMX	WP35CM
M1–M2	RDHT-TX	WS30PM	**RDMT-TX**	**TN6540**	RDPT-MMX	TN6540
M3	RDHT-TX	WS30PM	**RDMT-TX**	**TN6540**	RDPT-MMX	TN6540
K1–K2	RDMW-TX	WK15CM	**RDMW-TX**	**WK15CM**	RDMW-TX	WK15CM
K3	RDHW-MH	TN2510	**RDMW-TX**	**WK15CM**	RDMW-TX	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**RDMT-TX**	**TN6540**	–	–
S3	–	–	**RDMT-TX**	**TN6540**	–	–
S4	–	–	**RDMT-TX**	**TN6540**	RDPT-MMX	TN6540
H1	RDHW-MH	TN2510	**RDHW-MH**	**TN2510**	–	–

M100 • RD12 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	–	**–**	–	410	**320**	280	360	**280**	240	230	**200**	190	–	**–**	–	455	**395**	370	–	**–**	–	–	**–**	–
	2	–	**–**	–	320	**250**	215	250	**190**	170	195	**170**	140	–	**–**	–	280	**255**	230	–	**–**	–	–	**–**	–
	3	–	**–**	–	280	**215**	185	215	**170**	140	180	**150**	125	–	**–**	–	255	**230**	205	–	**–**	–	–	**–**	–
	4	–	**–**	–	235	**170**	145	180	**130**	110	160	**130**	105	–	**–**	–	190	**175**	160	–	**–**	–	–	**–**	–
	5	–	**–**	–	310	**235**	200	240	**180**	150	–	**–**	–	–	**–**	–	260	**230**	210	–	**–**	–	205	**175**	145
	6	–	**–**	–	205	**160**	130	160	**120**	100	–	**–**	–	–	**–**	–	160	**135**	110	–	**–**	–	180	**130**	95
M	1	–	**–**	–	190	**120**	80	130	**80**	60	–	**–**	–	–	**–**	–	205	**185**	155	270	**240**	220	250	**205**	170
	2	–	**–**	–	120	**80**	50	80	**50**	40	–	**–**	–	–	**–**	–	185	**160**	140	245	**215**	175	215	**175**	145
	3	–	**–**	–	125	**80**	55	85	**50**	40	–	**–**	–	–	**–**	–	145	**130**	115	185	**160**	125	175	**130**	100
K	1	120	**90**	75	275	**245**	220	220	**205**	180	–	**–**	–	505	**460**	410	295	**265**	240	–	**–**	–	–	**–**	–
	2	125	**100**	70	215	**190**	180	175	**155**	140	–	**–**	–	400	**355**	330	235	**210**	190	–	**–**	–	–	**–**	–
	3	130	**95**	60	180	**160**	145	155	**145**	125	–	**–**	–	335	**300**	275	195	**175**	160	–	**–**	–	–	**–**	–
N	1	900	**600**	500	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	685	**465**	385	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	450	**280**	200	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–	65	**55**	35	60	**50**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	66	**50**	33	100	**70**	50	70	**60**	35
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M100 • RD12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 6,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,35	**0,33**	0,56	0,25	**0,24**	0,40	0,19	**0,18**	0,30	0,16	**0,16**	0,26	0,15	**0,14**	0,24	RDHT-TX
RDMT-TX	0,35	**0,42**	0,70	0,25	**0,30**	0,50	0,19	**0,23**	0,38	0,16	**0,20**	0,33	0,15	**0,18**	0,30	RDMT-TX
RDPT-MMX	0,35	**0,57**	0,93	0,25	**0,41**	0,67	0,19	**0,31**	0,50	0,16	**0,27**	0,43	0,15	**0,25**	0,40	RDPT-MMX
RDHW-MH	0,35	**0,70**	1,08	0,25	**0,50**	0,78	0,19	**0,38**	0,58	0,16	**0,33**	0,50	0,15	**0,30**	0,46	RDHW-MH
RDMW-TX	0,35	**0,70**	1,16	0,25	**0,50**	0,83	0,19	**0,38**	0,62	0,16	**0,33**	0,54	0,15	**0,30**	0,50	RDMW-TX

At 3,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,40	**0,38**	0,64	0,29	**0,28**	0,46	0,22	**0,21**	0,35	0,19	**0,18**	0,30	0,17	**0,17**	0,28	RDHT-TX
RDMT-TX	0,40	**0,48**	0,81	0,29	**0,35**	0,58	0,22	**0,26**	0,43	0,19	**0,23**	0,38	0,17	**0,21**	0,35	RDMT-TX
RDPT-MMX	0,40	**0,66**	1,08	0,29	**0,48**	0,77	0,22	**0,36**	0,58	0,19	**0,31**	0,50	0,17	**0,29**	0,46	RDPT-MMX
RDHW-MH	0,40	**0,81**	1,25	0,29	**0,58**	0,90	0,22	**0,43**	0,67	0,19	**0,38**	0,58	0,17	**0,35**	0,53	RDHW-MH
RDMW-TX	0,40	**0,81**	1,34	0,29	**0,58**	0,96	0,22	**0,43**	0,72	0,19	**0,38**	0,62	0,17	**0,35**	0,57	RDMW-TX

At 1,50 Axial Depth of Cut (ap)

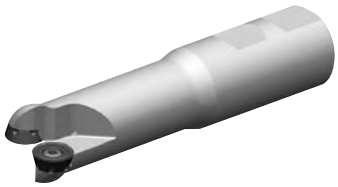
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,53	**0,50**	0,85	0,38	**0,36**	0,61	0,28	**0,27**	0,45	0,25	**0,24**	0,40	0,23	**0,22**	0,36	RDHT-TX
RDMT-TX	0,53	**0,63**	1,06	0,38	**0,46**	0,76	0,28	**0,34**	0,57	0,25	**0,30**	0,50	0,23	**0,27**	0,45	RDMT-TX
RDPT-MMX	0,53	**0,87**	1,42	0,38	**0,63**	1,01	0,28	**0,47**	0,76	0,25	**0,41**	0,66	0,23	**0,37**	0,60	RDPT-MMX
RDHW-MH	0,53	**1,06**	1,65	0,38	**0,76**	1,18	0,28	**0,57**	0,88	0,25	**0,50**	0,76	0,23	**0,45**	0,70	RDHW-MH
RDMW-TX	0,53	**1,06**	1,78	0,38	**0,76**	1,26	0,28	**0,57**	0,94	0,25	**0,50**	0,82	0,23	**0,45**	0,75	RDMW-TX

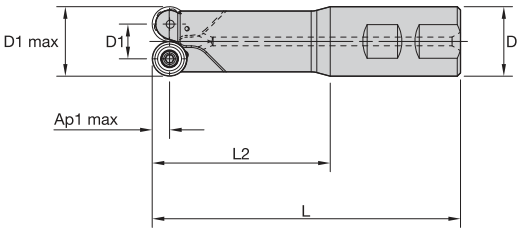
At 0,75 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,72	**0,69**	1,16	0,52	**0,50**	0,83	0,39	**0,37**	0,62	0,34	**0,32**	0,54	0,31	**0,30**	0,50	RDHT-TX
RDMT-TX	0,72	**0,87**	1,46	0,52	**0,62**	1,04	0,39	**0,47**	0,78	0,34	**0,41**	0,68	0,31	**0,37**	0,62	RDMT-TX
RDPT-MMX	0,72	**1,20**	1,96	0,52	**0,86**	1,39	0,39	**0,64**	1,03	0,34	**0,56**	0,90	0,31	**0,51**	0,82	RDPT-MMX
RDHW-MH	0,72	**1,46**	2,29	0,52	**1,04**	1,62	0,39	**0,78**	1,20	0,34	**0,68**	1,04	0,31	**0,62**	0,95	RDHW-MH
RDMW-TX	0,72	**1,46**	2,46	0,52	**1,04**	1,74	0,39	**0,78**	1,29	0,34	**0,68**	1,12	0,31	**0,62**	1,02	RDMW-TX

NOTE: Use "Light Machining" value as starting feed rate.

M100 • Weldon® Shank RD1605..• Metric

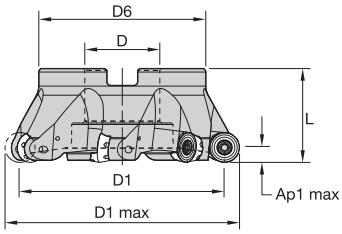




order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021341	**12391013800**	32	16	32	142	82	8,0	2	7.8	19000	Yes	1,10

NOTE: All spare parts except the insert screws must be ordered separately.

M100 • Shell Mills RD1605..• Metric



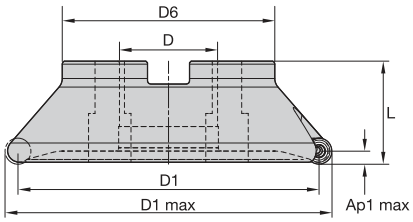
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021347	**12391021000**	50	34	22	40	40	8,0	4	10.3	13000	Yes	0,20
2021348	**12391021200**	63	47	27	48	40	8,0	4	7.0	12000	Yes	0,30
2021349	**12391021400**	80	64	27	60	50	8,0	5	4.8	10000	Yes	0,90
2021350	**12391021600**	100	84	32	78	50	8,0	6	3.8	9000	No	1,20
2021351	**12391021800**	125	109	40	89	50	8,0	7	2.8	8000	No	1,70

NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

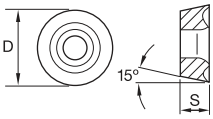
M100 • Shell Mills RC1606..• Metric



order number	catalogue number	D1 max	D1	D	D4	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021358	**12391023400**	50	34	22	—	40	40	8,0	4	6.0	13000	Yes	0,20
2021359	**12391023600**	52	36	22	—	40	40	8,0	4	5.8	13000	Yes	0,30
2021357	**12391023200**	63	47	27	—	48	40	8,0	5	4.0	12000	Yes	0,20
2021360	**12391023800**	66	50	27	—	48	40	8,0	5	3.8	12000	Yes	0,30
2021352	**12391022000**	80	64	27	—	60	50	8,0	6	2.8	10000	Yes	0,90
2021353	**12391022200**	100	84	32	—	78	50	8,0	7	2.3	9000	No	1,20
2021354	**12391022400**	125	109	40	—	89	50	8,0	8	1.8	8000	No	1,80
2021355	**12391022600**	160	144	40	67	90	63	8,0	9	1.3	7000	No	2,90

NOTE: All spare parts except the insert screws must be ordered separately.

M100 • RDMT-M0TX • RD1605..

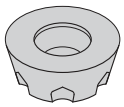


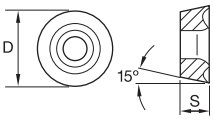
● first choice
○ alternate choice

	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
P		●	●	●		●	○	●
M		○	●			●	●	●
K	○	○	○		●	○		
N	●							○
S			●			○	●	●
H							○	

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT1605M0TX	6	16,00	5,56	–	'	'	'	'	'	6901189	'	'

M100 • RDMW-M0TX • RD1605..



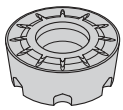


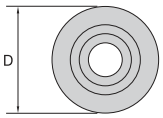
● first choice
○ alternate choice

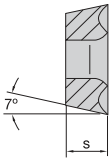
	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
P		●	●	●		●	○	●
M		○	●			●	●	●
K	○	○	○		●	○		
N	●							○
S			●			○	●	●
H							○	

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW1605M0TX	6	16,00	5,56	0,15	'	'	3523083	2012608	'	'	'	'
RDMW1605M0TX	6	16,00	5,56	–	'	'	'	'	'	6901191	'	'

M100 • RCMT-43 • RC1606..





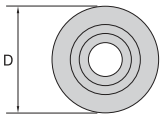


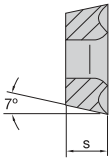
● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RCMT1606M043M	16,00	6,35	0,20	–	–	2957537	–	–	–	–	–
RCMT1606M043	16,00	6,35	0,20	2028170	–	–	–	–	–	–	–

M100 • RCMT-M0TX • RC1606..





● first choice
○ alternate choice

P			●	●	●		●	○	●
M			○	●			●	●	●
K		○	○	○		●	○		
N		●							○
S				●			○	●	●
H								○	

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RCMT1606M0TX	6	16,00	6,35	0,24	–	2957535	2957427	–	5427442	–	–	–
RCMT1606M0TX	6	16,00	6,35	—	–	–	–	–	–	6924077	–	–

M100 • RD1605 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	RDMT-TX	TN6525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
P3–P4	RDMT-TX	TN6525	**RDMW-TX**	**TN6540**	RDMW-TX	TN6540
P5–P6	RDMT-TX	WP35CM	**RDMT-TX**	**WP35CM**	RDMT-TX	WP35CM
M1–M2	RDMT-TX	TN6525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
M3	RDMT-TX	TN6525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
K1–K2	RDMW-TX	TN2510	**RDMW-TX**	**WP35CM**	RDMW-TX	WP35CM
K3	RDMW-TX	TN2510	**RDMW-TX**	**WP35CM**	RDMW-TX	WP35CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**RDMT-TX**	**TN6540**	–	–
S3	–	–	**RDMT-TX**	**TN6540**	–	–
S4	–	–	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
H1	RDMW-TX	TN2510	**RDMW-TX**	**TN2510**	–	–

M100 • RD1605 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	–	**–**	–	410	**320**	280	360	**280**	240	230	**200**	190	–	**–**	–	455	**395**	370	–	**–**	–	–	**–**	–
	2	–	**–**	–	320	**250**	215	250	**190**	170	195	**170**	140	–	**–**	–	280	**255**	230	–	**–**	–	–	**–**	–
	3	–	**–**	–	280	**215**	185	215	**170**	140	180	**150**	125	–	**–**	–	255	**230**	205	–	**–**	–	–	**–**	–
	4	–	**–**	–	235	**170**	145	180	**130**	110	160	**130**	105	–	**–**	–	190	**175**	160	–	**–**	–	–	**–**	–
	5	–	**–**	–	310	**235**	200	240	**180**	150	–	**–**	–	–	**–**	–	260	**230**	210	–	**–**	–	205	**175**	145
	6	–	**–**	–	205	**160**	130	160	**120**	100	–	**–**	–	–	**–**	–	160	**135**	110	–	**–**	–	180	**130**	95
M	1	–	**–**	–	190	**120**	80	130	**80**	60	–	**–**	–	–	**–**	–	205	**185**	155	270	**240**	220	250	**205**	170
	2	–	**–**	–	120	**80**	50	80	**50**	40	–	**–**	–	–	**–**	–	185	**160**	140	245	**215**	175	215	**175**	145
	3	–	**–**	–	125	**80**	55	85	**50**	40	–	**–**	–	–	**–**	–	145	**130**	115	185	**160**	125	175	**130**	100
K	1	120	**90**	75	275	**245**	220	220	**205**	180	–	**–**	–	505	**460**	410	295	**265**	240	–	**–**	–	–	**–**	–
	2	125	**100**	70	215	**190**	180	175	**155**	140	–	**–**	–	400	**355**	330	235	**210**	190	–	**–**	–	–	**–**	–
	3	130	**95**	60	180	**160**	145	155	**145**	125	–	**–**	–	335	**300**	275	195	**175**	160	–	**–**	–	–	**–**	–
N	1	900	**600**	500	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	685	**465**	385	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	450	**280**	200	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–	65	**55**	35	60	**50**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	66	**50**	33	100	**70**	50	70	**60**	35
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M100 • RD1605 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,11	**0,35**	0,70	0,08	**0,25**	0,50	0,06	**0,19**	0,38	0,05	**0,16**	0,33	0,05	**0,15**	0,30	RDHX-TX
RDMT-TX	0,23	**0,42**	0,84	0,17	**0,30**	0,60	0,13	**0,23**	0,45	0,11	**0,20**	0,39	0,10	**0,18**	0,36	RDMT-TX
RDMW-TX	0,23	**0,52**	1,05	0,17	**0,38**	0,76	0,13	**0,28**	0,56	0,11	**0,25**	0,49	0,10	**0,23**	0,45	RDMW-TX

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,13	**0,40**	0,81	0,10	**0,29**	0,58	0,07	**0,22**	0,43	0,06	**0,19**	0,38	0,06	**0,17**	0,35	RDHX-TX
RDMT-TX	0,27	**0,48**	0,97	0,19	**0,35**	0,70	0,14	**0,26**	0,52	0,13	**0,23**	0,45	0,12	**0,21**	0,42	RDMT-TX
RDMW-TX	0,27	**0,60**	1,22	0,19	**0,44**	0,87	0,14	**0,33**	0,65	0,13	**0,28**	0,57	0,12	**0,26**	0,52	RDMW-TX

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,17	**0,53**	1,06	0,13	**0,38**	0,76	0,09	**0,28**	0,57	0,08	**0,25**	0,50	0,08	**0,23**	0,45	RDHX-TX
RDMT-TX	0,35	**0,63**	1,28	0,25	**0,46**	0,92	0,19	**0,34**	0,68	0,17	**0,30**	0,59	0,15	**0,27**	0,54	RDMT-TX
RDMW-TX	0,35	**0,79**	1,61	0,25	**0,57**	1,15	0,19	**0,43**	0,85	0,17	**0,37**	0,74	0,15	**0,34**	0,68	RDMW-TX

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,24	**0,72**	1,46	0,17	**0,52**	1,04	0,13	**0,39**	0,78	0,11	**0,34**	0,68	0,10	**0,31**	0,62	RDHX-TX
RDMT-TX	0,48	**0,87**	1,76	0,35	**0,62**	1,26	0,26	**0,47**	0,93	0,23	**0,41**	0,81	0,21	**0,37**	0,74	RDMT-TX
RDMW-TX	0,48	**1,09**	2,22	0,35	**0,78**	1,58	0,26	**0,58**	1,17	0,23	**0,51**	1,02	0,21	**0,46**	0,93	RDMW-TX

NOTE: Use "Light Machining" value as starting feed rate.

M100 • RC1606 • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	...TX	TN6525	**...43M**	**TN6540**	...43M	TN6540
P3–P4	...TX	TN6525	**...TX**	**TN6540**	...43M	TN6540
P5–P6	...TX	TN6525	**...TX**	**WP35CM**	...TX	WP35CM
M1–M2	...TX	TN6525	**...TX**	**TN6540**	...TX	TN6540
M3	...TX	TN6525	**...TX**	**TN6540**	...TX	TN6540
K1–K2	...43	TN2510	**...TX**	**WK15CM**	...TX	WK15CM
K3	...TX	TN6525	**...TX**	**WK15CM**	...TX	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	...43M	TN6540	**...TX**	**TN6540**	...TX	TN6540
H1	–	–	**...TX**	**TN2510**	–	–

M100 • RC1606 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	–	**–**	–	410	**320**	280	360	**280**	240	230	**200**	190	–	**–**	–	455	**395**	370	–	**–**	–	–	**–**	–
	2	–	**–**	–	320	**250**	215	250	**190**	170	195	**170**	140	–	**–**	–	280	**255**	230	–	**–**	–	–	**–**	–
	3	–	**–**	–	280	**215**	185	215	**170**	140	180	**150**	125	–	**–**	–	255	**230**	205	–	**–**	–	–	**–**	–
	4	–	**–**	–	235	**170**	145	180	**130**	110	160	**130**	105	–	**–**	–	190	**175**	160	–	**–**	–	–	**–**	–
	5	–	**–**	–	310	**235**	200	240	**180**	150	–	**–**	–	–	**–**	–	260	**230**	210	–	**–**	–	205	**175**	145
	6	–	**–**	–	205	**160**	130	160	**120**	100	–	**–**	–	–	**–**	–	160	**135**	110	–	**–**	–	180	**130**	95
M	1	–	**–**	–	190	**120**	80	130	**80**	60	–	**–**	–	–	**–**	–	205	**185**	155	270	**240**	220	250	**205**	170
	2	–	**–**	–	120	**80**	50	80	**50**	40	–	**–**	–	–	**–**	–	185	**160**	140	245	**215**	175	215	**175**	145
	3	–	**–**	–	125	**80**	55	85	**50**	40	–	**–**	–	–	**–**	–	145	**130**	115	185	**160**	125	175	**130**	100
K	1	120	**90**	75	275	**245**	220	220	**205**	180	–	**–**	–	505	**460**	410	295	**265**	240	–	**–**	–	–	**–**	–
	2	125	**100**	70	215	**190**	180	175	**155**	140	–	**–**	–	400	**355**	330	235	**210**	190	–	**–**	–	–	**–**	–
	3	130	**95**	60	180	**160**	145	155	**145**	125	–	**–**	–	335	**300**	275	195	**175**	160	–	**–**	–	–	**–**	–
N	1	900	**600**	500	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	685	**465**	385	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	450	**280**	200	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–	65	**55**	35	60	**50**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	66	**50**	33	100	**70**	50	70	**60**	35
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M100 • RC1606 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)ç															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,46	**0,60**	0,93	0,33	**0,44**	0,67	0,25	**0,33**	0,50	0,22	**0,28**	0,44	0,20	**0,26**	0,40	...43
...TX	0,46	**0,70**	1,12	0,33	**0,50**	0,81	0,25	**0,38**	0,60	0,22	**0,33**	0,52	0,20	**0,30**	0,48	...TX

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,54	**0,70**	1,08	0,39	**0,50**	0,78	0,29	**0,38**	0,58	0,25	**0,33**	0,50	0,23	**0,30**	0,46	...43
...TX	0,54	**0,81**	1,30	0,39	**0,58**	0,93	0,29	**0,43**	0,69	0,25	**0,38**	0,61	0,23	**0,35**	0,55	...TX

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,70	**0,92**	1,42	0,51	**0,66**	1,02	0,38	**0,49**	0,76	0,33	**0,43**	0,66	0,30	**0,39**	0,60	...43
...TX	0,70	**1,06**	1,72	0,51	**0,76**	1,23	0,38	**0,57**	0,91	0,33	**0,50**	0,79	0,30	**0,45**	0,73	...TX

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,96	**1,26**	1,97	0,69	**0,90**	1,40	0,52	**0,67**	1,04	0,45	**0,59**	0,90	0,41	**0,54**	0,83	...43
...TX	0,96	**1,46**	2,38	0,69	**1,04**	1,68	0,52	**0,78**	1,25	0,45	**0,68**	1,08	0,41	**0,62**	0,99	...TX

NOTE: Use "Light Machining" value as starting feed rate.

M270™ Series

M270 Toroidal, M270 High-Feed, M270 Ball Nose Copy Mills

With precision-engineered ball nose, toroidal, and high-feed inserts, the M270 Copy Mill Series provides the highest accuracy and insert stability for exceptional reliability and performance in semi-finishing and finishing applications.

Secure and rigid insert clamping.

Toroidal and high-feed inserts can use the same holder.

V-shaped contact faces enable maximum stability and accuracy.

Inserts offered can machine steel, stainless steel, cast iron, high-temp alloys, and hardened materials.

The M270 Series offers reliability and accuracy in semi-finishing and finishing operations with rigid insert clamping and V-shaped contact faces in various materials.

INSERTS

BF/BR

Ball nose inserts

TF

Toroidal inserts

HF

High-feed inserts

ACCURATE AND RELIABLE WITH M270

PRODUCT

SERIES

M270™

DIAMETER RANGE

10–32mm

SHANK TYPES

Screw-On End Mills
Cylindrical End Mills
Weldon® End Mills

INDUSTRY

GENERAL ENGINEERING

ENERGY

TRANSPORTATION

AEROSPACE

APPLICATIONS

3D PROFILING

FACE MILLING

HELICAL MILLING/ POCKET MILLING

POCKETING

RAMPING BLANK

SIDE MILLING/ SHOULDER MILLING: BALL NOSE

SIDE MILLING/ SHOULDER MILLING: SQUARE END

SLOTTING: BALL NOSE

SLOTTING: SQUARE END

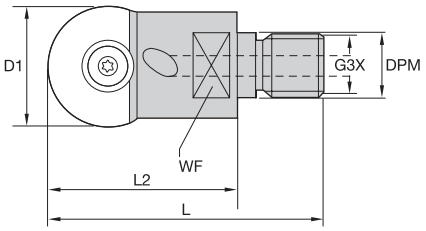
ACCURATE

V-shaped contact faces ensure highly accurate insert positioning.

RELIABLE

Secure insert clamping provides a rigid setup for machining operations.

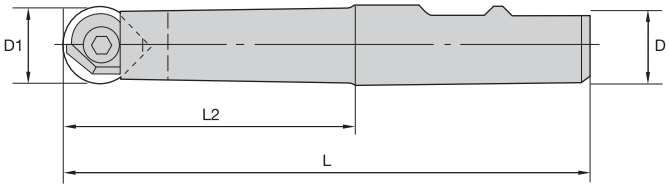
M270 Ball Nose • Screw-On • Metric



order number	catalogue number	D1	DPM	G3X	L	L2	WF	Z	Z U	insert	max RPM	coolant supply	kg
2243624	M270BD010M08	10	8,5	M8	42	25	10,0	1	2	M270B.10	57000	Yes	0,05
2243625	M270BD012M08	12	8,5	M8	42	25	10,0	1	2	M270B.12	55000	Yes	0,05
2243626	M270BD016M08	16	8,5	M8	47	30	10,0	1	2	M270B.16	53000	Yes	0,05
2243627	M270BD020M10	20	10,5	M10	59	40	14,0	1	2	M270B.20	52000	Yes	0,10
2243628	M270BD025M12	25	12,5	M12	72	50	19,0	1	2	M270B.25	50000	Yes	0,10
2243629	M270BD032M16	32	17,0	M16	73	50	22,0	1	2	M270B.32	46000	Yes	0,20

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

M270 Ball Nose • Weldon® Shank • Metric



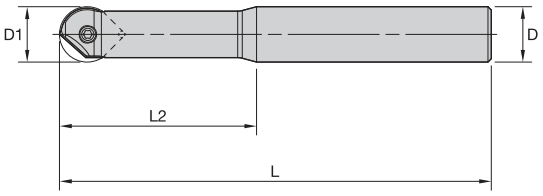
order number	catalogue number	D1	D	L	L2	Z	Z U	insert	max RPM	coolant supply	kg
2243618	M270BD010B12L90	10	12	90	45	1	2	M270B.10	57000	No	0,10
2243619	M270BD012B12L95	12	12	95	50	1	2	M270B.12	55000	No	0,10
2243620	M270BD016B16L105	16	16	105	57	1	2	M270B.16	53000	No	0,10
2243621	M270BD020B20L120	20	20	120	70	1	2	M270B.20	52000	No	0,20
2243622	M270BD025B25L145	25	25	145	89	1	2	M270B.25	50000	No	0,40
2243623	M270BD032B32L155	32	32	155	95	1	2	M270B.32	46000	No	0,80

NOTE: ZU = Effective teeth
Z = number of pocket seats
NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

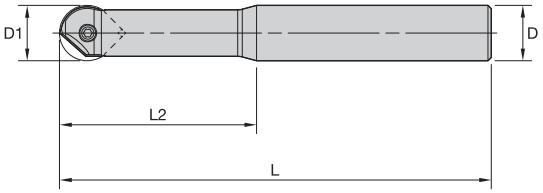
M270 Ball Nose • Cylindrical Shank • Metric



order number	catalogue number	D1	D	L	L2	Z	Z U	insert	max RPM	coolant supply	kg
2243613	**M270BD010A12L140**	10	12	140	45	1	2	M270B.10	57000	No	0,10
2243614	**M270BD012A12L145**	12	12	145	50	1	2	M270B.12	55000	No	0,10
2067470	**M270BD016A16L155**	16	16	155	57	1	2	M270B.16	53000	No	0,20
2243615	**M270BD020A20L170**	20	20	170	70	1	2	M270B.20	52000	No	0,40
2243616	**M270BD025A25L195**	25	25	195	89	1	2	M270B.25	50000	No	0,60
2243617	**M270BD032A32L205**	32	32	205	95	1	2	M270B.32	46000	No	1,10

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

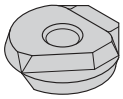
M270 Ball Nose • Carbide Cylindrical Shank • Metric

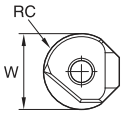


order number	catalogue number	D1	D	L	L2	Z	Z U	insert	max RPM	coolant supply	kg
2424550	**M270BD010A12L140C**	10	12	140	45	1	2	M270B.10	57000	Yes	0,20
2424587	**M270BD012A12L145C**	12	12	145	50	1	2	M270B.12	55000	Yes	0,20
2424634	**M270BD016A16L155C**	16	16	155	57	1	2	M270B.16	53000	Yes	0,40
2639257	**M270BD020A20L170C**	20	20	170	70	1	2	M270B.20	52000	Yes	0,65

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

M270 Ball Nose • BF MM



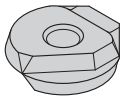


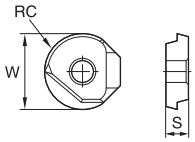
● first choice
○ alternate choice

P	○	●	●	●	
M		○	●	●	
K	●	○	○	○	●
N					
S			●	○	
H	●				●

catalogue number	W	S	RC	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270BF10	10,00	2,38	5,00	0,08	2012698	-	-	-	-
M270BF10	10,00	2,38	5,00	–	-	-	-	-	6724704
M270BF12	12,00	3,18	6,00	0,08	2012718	2957538	-	-	-
M270BF12	12,00	3,18	6,00	–	-	-	-	-	6724743
M270BF16	16,00	4,76	8,00	0,08	2012728	2957541	-	-	-
M270BF16	16,00	4,76	8,00	–	-	-	-	-	6724742
M270BF20	20,00	4,76	10,00	0,10	2012748	2957542	-	-	-
M270BF20	20,00	4,76	10,00	–	-	-	-	-	6724709
M270BF25	25,00	4,76	12,50	0,10	2012758	-	-	-	-
M270BF25	25,00	4,76	12,50	–	-	-	-	-	6724745
M270BF32	32,00	4,76	16,00	0,10	2012778	-	-	-	-
M270BF32	32,00	4,76	16,00	–	-	-	-	-	6724707

M270 Ball Nose • BR MM





● first choice
○ alternate choice

P		○	●	●	●	
M			○	●	●	
K		●	○	○	○	●
N						
S				●	○	
H		●				●

catalogue number	W	S	RC	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270BR10	10,00	2,38	5,00	–	'	'	'	6901879	'
M270BR12	12,00	3,18	6,00	0,08	'	'	2957539	'	'
M270BR12	12,00	3,18	6,00	–	'	'	'	6901880	'
M270BR16	16,00	4,76	8,00	0,08	'	'	2957540	'	'
M270BR16	16,00	4,76	8,00	–	'	'	'	6901891	'
M270BR20	20,00	4,76	10,00	0,10	'	'	2957543	'	'
M270BR20	20,00	4,76	10,00	–	'	'	'	6901892	'
M270BR25	25,00	4,76	12,50	–	'	'	'	6901893	'
M270BR32	32,00	4,76	16,00	–	'	'	'	6901894	'

M270 Ball Nose • B10 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM
P3–P4	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM
P5–P6	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM
M1–M2	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
M3	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
K1–K2	BF	TN2505	**BF**	**WU10PM**	BF	WU10PM
K3	BF	TN2505	**BF**	**WU10PM**	BF	WU10PM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	–	–	**–**	**–**	–	–
H1	BF	TN2505	**BF**	**TN2505**	BF	TN2505

M270 Ball Nose • B12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM
P3–P4	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM
P5–P6	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM
M1–M2	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
M3	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
K1–K2	BF	TN2505	**BF**	**WU10PM**	BF	WU10PM
K3	BF	TN2505	**BF**	**WU10PM**	BF	WU10PM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	–	–	**–**	**–**	–	–
H1	BF	TN2505	**BF**	**TN2505**	BF	TN2505

M270 Ball Nose • B16 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN6525	**BR**	**TN6540**	BR	WP35CM
P3–P4	BF	TN6525	**BR**	**TN6540**	BR	WP35CM
P5–P6	BF	TN6525	**BR**	**TN6540**	BR	WP35CM
M1–M2	BF	TN6525	**BF**	**TN6525**	BR	WP35CM
M3	BF	TN6525	**BF**	**TN6525**	BR	WP35CM
K1–K2	BF	TN2505	**BF**	**WU10PM**	BF	WU10PM
K3	BF	TN2505	**BF**	**WU10PM**	BF	WU10PM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	BF	TN2505	**–**	**–**	–	–
H1	BF	TN2505	**BF**	**TN2505**	BF	TN2505

M270 Ball Nose • B20 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BR	TN6540	**BF**	**TN6540**	BF	TN6540
P3–P4	BR	TN6540	**BF**	**TN6540**	BR	WP35CM
P5–P6	BR	TN6540	**BR**	**WP35CM**	BR	WP35CM
M1–M2	BR	TN6540	**BR**	**TN6540**	BR	TN6540
M3	BR	TN6540	**BR**	**TN6540**	BR	TN6540
K1–K2	BR	TN2505	**BR**	**TN2505**	–	–
K3	BR	TN2505	**BR**	**TN2505**	–	–
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**BR**	**TN6540**	–	–
S3	–	–	**BR**	**TN6540**	–	–
S4	–	–	**BR**	**TN6540**	–	–
H1	–	–	**BR**	**TN2505**	–	–

M270 Ball Nose • B25 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
P3–P4	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
P5–P6	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
M1–M2	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
M3	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
K1–K2	BF	TN2505	**BF**	**TN2505**	BF	TN2505
K3	BF	TN2505	**BF**	**TN2505**	BF	TN2505
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	BR	WP35CM	**–**	**–**	–	–
S3	BR	WP35CM	**–**	**–**	–	–
S4	BF	TN2505	**BR**	**WP35CM**	–	–
H1	BF	TN2505	**BR**	**WP35CM**	BR	WP35CM

M270 Ball Nose • B32 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
P3–P4	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
P5–P6	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
M1–M2	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
M3	BR	WP35CM	**BR**	**WP35CM**	BR	WP35CM
K1–K2	BF	TN2505	**BF**	**TN2505**	BF	TN2505
K3	BF	TN2505	**BF**	**TN2505**	BF	TN2505
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	BR	WP35CM	**–**	**–**	–	–
S3	BR	WP35CM	**–**	**–**	–	–
S4	BR	WP35CM	**BR**	**WP35CM**	–	–
H1	BF	TN2505	**BF**	**TN2505**	BF	TN2505

M270 Ball Nose • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540			WP35CM			WU10PM		
P	1	550	**420**	360	410	**320**	280	360	**280**	240	455	**395**	370	–	**–**	–
	2	320	**240**	205	320	**250**	215	250	**190**	170	280	**255**	230	–	**–**	–
	3	320	**240**	205	280	**215**	185	215	**170**	140	255	**230**	205	–	**–**	–
	4	–	**–**	–	235	**170**	145	180	**130**	110	190	**175**	160	–	**–**	–
	5	–	**–**	–	310	**235**	200	240	**180**	150	260	**230**	210	–	**–**	–
	6	–	**–**	–	205	**160**	130	160	**120**	100	160	**135**	110	–	**–**	–
M	1	–	**–**	–	190	**120**	80	130	**80**	60	205	**185**	155	–	**–**	–
	2	–	**–**	–	120	**80**	50	80	**50**	40	185	**160**	140	–	**–**	–
	3	–	**–**	–	125	**80**	55	85	**50**	40	145	**130**	115	–	**–**	–
K	1	400	**300**	250	275	**245**	220	220	**205**	180	295	**265**	240	295	**265**	240
	2	540	**365**	280	215	**190**	180	175	**155**	140	235	**210**	190	230	**205**	190
	3	310	**190**	155	180	**160**	145	155	**145**	125	195	**175**	160	195	**175**	160
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	60	**30**	25	66	**50**	33	–	**–**	–
H	1	175	**140**	95	–	**–**	–	–	**–**	–	–	**–**	–	160	**130**	90
	2	175	**140**	95	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	140	**115**	80	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M270 Ball Nose • B10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 4,76mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,12	**0,23**	0,42	0,08	**0,16**	0,29	0,06	**0,12**	0,21	0,05	**0,10**	0,18	0,05	**0,10**	0,17	BF
BR	0,19	**0,29**	0,51	0,14	**0,20**	0,35	0,10	**0,15**	0,25	0,09	**0,13**	0,22	0,08	**0,12**	0,20	BR

At 2,38mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,14	**0,27**	0,49	0,10	**0,19**	0,34	0,07	**0,14**	0,25	0,06	**0,12**	0,21	0,06	**0,11**	0,19	BF
BR	0,22	**0,34**	0,61	0,16	**0,24**	0,40	0,12	**0,17**	0,29	0,10	**0,15**	0,25	0,09	**0,14**	0,23	BR

At 1,19mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,18	**0,36**	0,68	0,13	**0,25**	0,45	0,09	**0,18**	0,32	0,08	**0,16**	0,28	0,08	**0,15**	0,25	BF
BR	0,29	**0,46**	0,84	0,21	**0,31**	0,54	0,15	**0,23**	0,39	0,13	**0,20**	0,33	0,12	**0,18**	0,30	BR

At 0,60mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,25	**0,51**	1,02	0,18	**0,34**	0,63	0,13	**0,25**	0,44	0,11	**0,22**	0,38	0,10	**0,20**	0,35	BF
BR	0,41	**0,66**	1,34	0,28	**0,44**	0,76	0,21	**0,31**	0,53	0,18	**0,27**	0,45	0,17	**0,25**	0,41	BR

NOTE: Use "Light Machining" value as starting feed rate.

M270 Ball Nose • B12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,13	**0,29**	0,43	0,09	**0,20**	0,30	0,07	**0,15**	0,22	0,06	**0,13**	0,19	0,06	**0,12**	0,18	BR
BF	0,21	**0,39**	0,58	0,15	**0,27**	0,40	0,11	**0,20**	0,29	0,10	**0,18**	0,25	0,09	**0,16**	0,23	BF

At 2,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,15	**0,33**	0,50	0,11	**0,24**	0,35	0,08	**0,17**	0,26	0,07	**0,15**	0,22	0,06	**0,14**	0,20	BR
BF	0,24	**0,46**	0,69	0,17	**0,32**	0,47	0,13	**0,23**	0,34	0,11	**0,20**	0,29	0,10	**0,18**	0,27	BF

At 1,25mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,20	**0,45**	0,68	0,14	**0,31**	0,46	0,11	**0,23**	0,34	0,09	**0,20**	0,29	0,08	**0,18**	0,27	BR
BF	0,32	**0,61**	0,94	0,23	**0,42**	0,62	0,17	**0,31**	0,45	0,15	**0,26**	0,38	0,13	**0,24**	0,35	BF

At 0,63mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BR	0,28	**0,63**	0,99	0,20	**0,43**	0,64	0,15	**0,31**	0,46	0,13	**0,27**	0,40	0,12	**0,25**	0,36	BR
BF	0,45	**0,89**	1,42	0,31	**0,58**	0,87	0,23	**0,42**	0,61	0,20	**0,36**	0,53	0,18	**0,33**	0,48	BF

NOTE: Use "Light Machining" value as starting feed rate.

M270 Ball Nose • B16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,14	**0,28**	0,45	0,10	**0,20**	0,31	0,08	**0,15**	0,23	0,07	**0,13**	0,20	0,06	**0,12**	0,18	BF
BR	0,21	**0,38**	0,59	0,15	**0,27**	0,41	0,11	**0,20**	0,30	0,10	**0,17**	0,26	0,09	**0,16**	0,24	BR

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,16	**0,33**	0,52	0,12	**0,23**	0,36	0,09	**0,17**	0,27	0,08	**0,15**	0,23	0,07	**0,14**	0,21	BF
BR	0,24	**0,45**	0,69	0,17	**0,31**	0,48	0,13	**0,23**	0,35	0,11	**0,20**	0,30	0,10	**0,18**	0,28	BR

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,21	**0,44**	0,70	0,15	**0,31**	0,48	0,11	**0,23**	0,35	0,10	**0,20**	0,30	0,09	**0,18**	0,28	BF
BR	0,32	**0,60**	0,94	0,23	**0,42**	0,63	0,17	**0,31**	0,46	0,15	**0,26**	0,40	0,13	**0,24**	0,36	BR

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,29	**0,61**	0,99	0,21	**0,43**	0,66	0,16	**0,31**	0,48	0,14	**0,27**	0,42	0,12	**0,25**	0,38	BF
BR	0,44	**0,85**	1,38	0,31	**0,57**	0,88	0,23	**0,42**	0,63	0,20	**0,36**	0,54	0,18	**0,33**	0,50	BR

NOTE: Use "Light Machining" value as starting feed rate.

M270 Ball Nose • B20 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 10,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,19	**0,24**	0,40	0,13	**0,17**	0,28	0,10	**0,13**	0,21	0,09	**0,11**	0,18	0,08	**0,10**	0,17	BF
BR	0,24	**0,38**	0,65	0,17	**0,27**	0,46	0,13	**0,20**	0,34	0,11	**0,17**	0,30	0,10	**0,16**	0,27	BR

At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,22	**0,28**	0,46	0,15	**0,20**	0,33	0,12	**0,15**	0,24	0,10	**0,13**	0,21	0,09	**0,12**	0,19	BF
BR	0,27	**0,44**	0,76	0,20	**0,31**	0,53	0,15	**0,23**	0,39	0,13	**0,20**	0,34	0,12	**0,18**	0,31	BR

At 2,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,28	**0,37**	0,61	0,20	**0,27**	0,43	0,15	**0,20**	0,32	0,13	**0,17**	0,28	0,12	**0,16**	0,25	BF
BR	0,36	**0,58**	1,01	0,26	**0,41**	0,70	0,19	**0,30**	0,52	0,17	**0,26**	0,45	0,15	**0,24**	0,41	BR

At 1,25mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,39	**0,51**	0,85	0,28	**0,36**	0,59	0,21	**0,27**	0,44	0,18	**0,23**	0,38	0,17	**0,21**	0,35	BF
BR	0,50	**0,81**	1,44	0,36	**0,56**	0,97	0,26	**0,42**	0,71	0,23	**0,36**	0,61	0,21	**0,33**	0,56	BR

NOTE: Use "Light Machining" value as starting feed rate.

M270 Ball Nose • B25 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 12,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,17	**0,31**	0,50	0,13	**0,22**	0,36	0,09	**0,16**	0,26	0,08	**0,14**	0,23	0,08	**0,13**	0,21	BF
BR	0,24	**0,38**	0,65	0,17	**0,27**	0,46	0,13	**0,20**	0,34	0,11	**0,17**	0,30	0,10	**0,16**	0,27	BR

At 6,25mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,20	**0,35**	0,58	0,15	**0,25**	0,41	0,11	**0,19**	0,30	0,09	**0,16**	0,27	0,09	**0,15**	0,24	BF
BR	0,27	**0,44**	0,76	0,20	**0,31**	0,53	0,15	**0,23**	0,39	0,13	**0,20**	0,34	0,12	**0,18**	0,31	BR

At 3,13mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,27	**0,47**	0,77	0,19	**0,33**	0,54	0,14	**0,25**	0,40	0,12	**0,21**	0,35	0,11	**0,20**	0,32	BF
BR	0,36	**0,58**	1,02	0,26	**0,41**	0,70	0,19	**0,30**	0,52	0,17	**0,26**	0,45	0,15	**0,24**	0,41	BR

At 1,56mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,37	**0,65**	1,09	0,26	**0,46**	0,75	0,19	**0,34**	0,55	0,17	**0,29**	0,47	0,15	**0,27**	0,43	BF
BR	0,50	**0,81**	1,44	0,36	**0,56**	0,97	0,26	**0,42**	0,71	0,23	**0,36**	0,61	0,21	**0,33**	0,56	BR

NOTE: Use "Light Machining" value as starting feed rate.

M270 Ball Nose • B32 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 16,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,17	**0,30**	0,47	0,13	**0,22**	0,34	0,09	**0,16**	0,25	0,08	**0,14**	0,22	0,08	**0,13**	0,20	BF
BR	0,23	**0,38**	0,59	0,17	**0,27**	0,42	0,13	**0,20**	0,31	0,11	**0,17**	0,27	0,10	**0,16**	0,25	BR

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,20	**0,35**	0,55	0,15	**0,25**	0,39	0,11	**0,19**	0,29	0,09	**0,16**	0,25	0,09	**0,15**	0,23	BF
BR	0,27	**0,43**	0,69	0,19	**0,31**	0,49	0,14	**0,23**	0,36	0,13	**0,20**	0,32	0,12	**0,18**	0,29	BR

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,26	**0,46**	0,72	0,19	**0,33**	0,51	0,14	**0,25**	0,38	0,12	**0,21**	0,33	0,11	**0,20**	0,30	BF
BR	0,35	**0,57**	0,92	0,25	**0,41**	0,64	0,19	**0,30**	0,48	0,17	**0,26**	0,41	0,15	**0,24**	0,38	BR

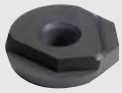
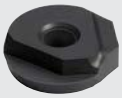
At 2,00mm Axial Depth of Cut (ap)

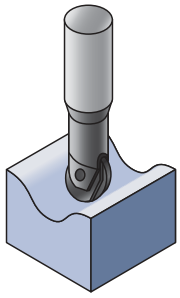
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,36	**0,64**	1,01	0,26	**0,45**	0,71	0,19	**0,34**	0,52	0,17	**0,29**	0,45	0,15	**0,27**	0,41	BF
BR	0,49	**0,80**	1,28	0,35	**0,56**	0,89	0,26	**0,42**	0,65	0,23	**0,36**	0,57	0,21	**0,33**	0,52	BR

NOTE: Use "Light Machining" value as starting feed rate.

Selecting the Correct Insert and Cutting Conditions for Your Application

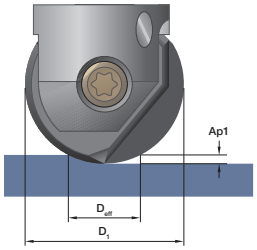
1. Insert Style: Considerations for Selecting the Correct Insert

Best Choices for Insert and Grade Selection ● First choice ○ Alternate choice	BR Geometry		BF Geometry
			
Grade	WP35CM	WU10PM	TN2505
Roughing Operation	●	○	
Finishing Operation		○	●
Low RPM Machine	●	○	
Flat Areas or Face Milling (≤10° inclination)	●	○	
Hard Machining		○	●
Unstable and/or Long Overhangs	●	○	
HSM or 5-Axis Machining (smaller ap/ae values)	●	○	

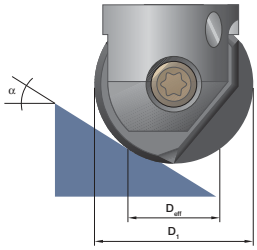


2. Calculating effective diameter and resulting surface speed

It is important to consider the effective diameter (Deff) when using light depths of cut in order to properly calculate RPM values. Use the following formula when machining flat surfaces or inclinations of 10° or less to find the Deff value, and then use this for RPM calculations as opposed to using the overall insert diameter (D1).



When machining inclinations between 11° and 55°, further modification of vc is required. Apply factor "k" from the given formula to calculate the correct vc (vceff). This corrected value is then used to calculate the proper RPM for the tool.



$$\text{Deff} = \sqrt{D1^2-(D1-2Ap1)^2}$$

$$k = \frac{1}{\sin\left[\alpha + \arccos\left(1-(2\,(Ap1/D1))\right)\right]}$$

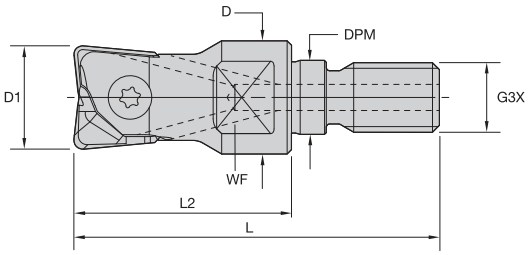
$$v_c eff = v_c \times k$$

Starting Values for Semi-Finishing in Common Material Types (L/D ratio <3 x D1)

M270 is usually applied for semi-finishing and finishing operations; Ap1/ae conditions depend on the operation. As a general rule: Ap1/ae ≤0,05D.

Material	Tool Diameter																	
	Ø10			Ø12			Ø16			Ø20			Ø25			Ø32		
	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)	max rec. (mm)		fz (mm/ tooth)
	Ap1	ae		Ap1	ae		Ap1	ae		Ap1	ae		Ap1	ae		Ap1	ae	
Soft Steel <250 HB	0,7	0,7	0,2	0,8	0,8	0,2	1,1	1,1	0,27	1,3	1,3	0,27	1,7	1,7	0,3	2,1	2,1	0,3
High-Strength Steel 33–44 HRC	0,5	0,5	0,15	0,6	0,6	0,2	0,8	0,8	0,25	1	1	0,25	1,3	1,3	0,25	1,6	1,6	0,25
Hardened Steel 44–55 HRC	0,3	0,3	0,15	0,4	0,4	0,2	0,5	0,5	0,22	0,7	0,7	0,22	0,8	0,8	0,25	1,1	1,1	0,25
Gray Cast Iron GG25…	1	1	0,2	1,2	1,2	0,25	1,6	1,6	0,25	2	2	0,25	2,5	2,5	0,3	3,2	3,2	0,3
Nodular Cast Iron GGG60…	0,7	0,7	0,2	0,8	0,8	0,25	1,1	1,1	0,25	1,3	1,3	0,25	1,7	1,7	0,3	2,1	2,1	0,3

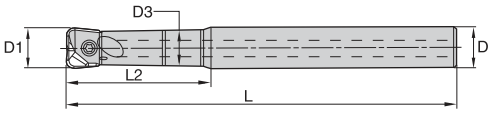
M270 Toroidal • Screw-On • Metric



order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Z	Z U	inserts	max RPM	coolant supply	kg
3926546	M270TD012M08	12	13	8,5	M8	42	25	10	1	2	M270TF12R..	55000	Yes	0,02
3926547	M270TD016M08	16	13	8,5	M8	47	30	10	1	2	M270TF16R..	53000	Yes	0,09
3926548	M270TD020M10	20	18	10,5	M10	59	40	14	1	2	M270TF20R..	52000	Yes	0,07

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

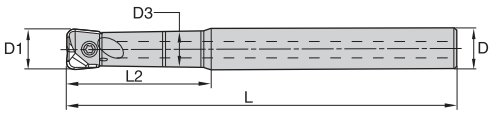
M270 Toroidal • Cylindrical Shank • Metric



order number	catalogue number	D1	D	D3	L	L2	Z	Z U	inserts	max RPM	coolant supply	kg
3926514	M270TD010A10L120	10	10	9	120	45	1	2	M270TF10R..	57000	Yes	0,06
3926515	M270TD012A12L140	12	12	11	140	50	1	2	M270TF12R..	55000	Yes	0,09
3926516	M270TD016A16L160	16	16	14	160	57	1	2	M270TF16R..	53000	Yes	0,19
3926517	M270TD020A20L180	20	20	18	180	70	1	2	M270TF20R..	52000	Yes	0,35

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

M270 Toroidal • Carbide Cylindrical Shank • Metric



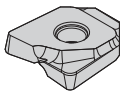
order number	catalogue number	D1	D	D3	L	L2	Z	Z U	inserts	max RPM	coolant supply	kg
3926518	M270TD010A10L120C	10	10	9	120	45	1	2	M270TF10R..	57000	Yes	0,11
3926519	M270TD010A10L150C	10	10	9	150	45	1	2	M270TF10R..	57000	Yes	0,14
3926520	M270TD012A12L120C	12	12	11	120	50	1	2	M270TF12R..	55000	Yes	0,15
3926521	M270TD012A12L160C	12	12	11	160	50	1	2	M270TF12R..	55000	Yes	0,22
3926522	M270TD016A16L140C	16	16	14	140	57	1	2	M270TF16R..	53000	Yes	0,32
3926543	M270TD016A16L180C	16	16	14	180	57	1	2	M270TF16R..	53000	Yes	0,44
3926544	M270TD020A20L150C	20	20	18	150	70	1	2	M270TF20R..	52000	Yes	0,52
3926545	M270TD020A20L200C	20	20	18	200	70	1	2	M270TF20R..	52000	Yes	0,74

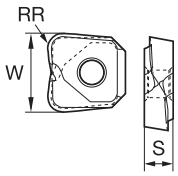
NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M270 Toroidal • TF





● first choice
○ alternate choice

	TN2505	TN6525	TN6540	WP35CM	WU10PM
P	○	●	●	●	
M		○	●	●	
K	●	○	○	○	●
N					
S			●	○	
H	●				●

catalogue number	W	S	RR	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270TF10R05	10,00	2,38	0,50	–	–	–	–	–	6724706
M270TF10R1	10,00	2,38	1,00	0,08	2095682	–	–	–	–
M270TF12R05	12,00	3,18	0,50	–	–	–	–	–	6724705
M270TF12R1	12,00	3,18	1,01	–	–	–	–	–	6724710
M270TF12R2	12,00	3,18	2,01	0,08	2095640	–	–	–	–
M270TF16R05	16,00	4,76	0,50	–	–	–	–	–	6724703
M270TF16R1	16,00	4,76	1,01	–	–	–	–	–	6724744
M270TF20R05	20,00	4,76	0,50	–	–	–	–	–	6724708

M270 Toroidal • Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	TF	WU10PM	**TF**	**WU10PM**	TF	WU10PM
P3–P4	TF	WU10PM	**TF**	**WU10PM**	TF	WU10PM
P5–P6	TF	WU10PM	**TF**	**WU10PM**	–	–
M1–M2	TF	WU10PM	–	–	–	–
M3	TF	WU10PM	–	–	–	–
K1–K2	TF	WU10PM	**TF**	**WU10PM**	–	–
K3	TF	WU10PM	**TF**	**WU10PM**	–	–
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	TF	WU10PM	–	–	–	–
S3	TF	WU10PM	–	–	–	–
S4	TF	WU10PM	–	–	–	–
H1	TF	TN2505	**TF**	**WU10PM**	–	–

M270 Toroidal • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540			WP35CM			WU10PM		
P	1	550	**420**	360	410	**320**	280	360	**280**	240	455	**395**	370	–	–	–
	2	320	**240**	205	320	**250**	215	250	**190**	170	280	**255**	230	–	–	–
	3	320	**240**	205	280	**215**	185	215	**170**	140	255	**230**	205	–	–	–
	4	–	–	–	235	**170**	145	180	**130**	110	190	**175**	160	–	–	–
	5	–	–	–	310	**235**	200	240	**180**	150	260	**230**	210	–	–	–
	6	–	–	–	205	**160**	130	160	**120**	100	160	**135**	110	–	–	–
M	1	–	–	–	190	**120**	80	130	**80**	60	205	**185**	155	–	–	–
	2	–	–	–	120	**80**	50	80	**50**	40	185	**160**	140	–	–	–
	3	–	–	–	125	**80**	55	85	**50**	40	145	**130**	115	–	–	–
K	1	400	**300**	250	275	**245**	220	220	**205**	180	295	**265**	240	295	**265**	240
	2	540	**365**	280	215	**190**	180	175	**155**	140	235	**210**	190	230	**205**	190
	3	310	**190**	155	180	**160**	145	155	**145**	125	195	**175**	160	195	**175**	160
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**35**	30	–	–	–	–	–	–
	2	–	–	–	–	–	–	25	**20**	10	–	–	–	–	–	–
	3	–	–	–	–	–	–	70	**40**	30	–	–	–	–	–	–
	4	–	–	–	–	–	–	60	**30**	25	66	**50**	33	–	–	–
H	1	175	**140**	95	–	–	–	–	–	–	–	–	–	160	**130**	90
	2	175	**140**	95	–	–	–	–	–	–	–	–	–	–	–	–
	3	140	**115**	80	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

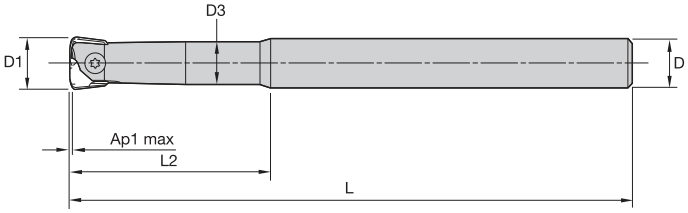
M270 Toroidal • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) 5%			10%			20%			30%			40–100%			Insert Geometry
TF	0,12	**0,37**	0,62	0,09	**0,26**	0,43	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	TF

NOTE: Use "Light Machining" value as starting feed rate.

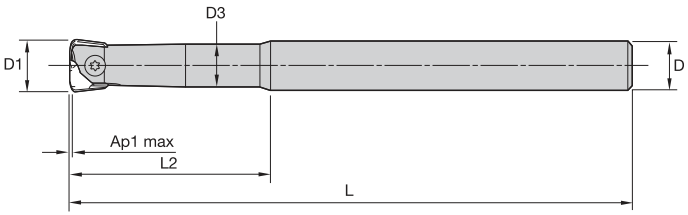
M270 High Feed • Cylindrical Shank • Metric



order number	catalogue number	D1	D	D3	L	L2	Ap1 max	Z	Z U	insert 1	max RPM	coolant supply	kg
3926514	M270TD010A10L120	10	10	9	120	45	0,6	1	2	M270HF10	57000	Yes	0,06
3926515	M270TD012A12L140	12	12	11	140	50	0,6	1	2	M270HF12	55000	Yes	0,09
3926516	M270TD016A16L160	16	16	14	160	57	0,9	1	2	M270HF16	53000	Yes	0,19

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

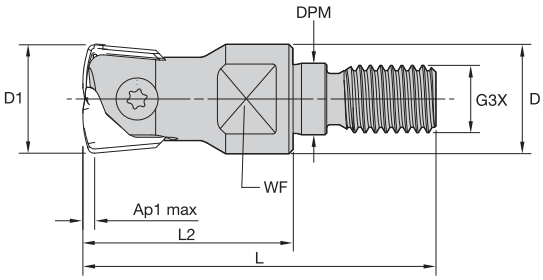
M270 High Feed • Carbide Cylindrical Shank • Metric



order number	catalogue number	D1	D	D3	L	L2	Ap1 max	Z	Z U	insert 1	max RPM	coolant supply	kg
3926518	M270TD010A10L120C	10	10	9	120	45	0,6	1	2	M270HF10	57000	Yes	0,11
3926519	M270TD010A10L150C	10	10	9	150	45	0,6	1	2	M270HF10	57000	Yes	0,14
3926520	M270TD012A12L120C	12	12	11	120	50	0,6	1	2	M270HF12	55000	Yes	0,15
3926521	M270TD012A12L160C	12	12	11	160	50	0,6	1	2	M270HF12	55000	Yes	0,22
3926522	M270TD016A16L140C	16	16	14	140	57	0,9	1	2	M270HF16	53000	Yes	0,32
3926543	M270TD016A16L180C	16	16	14	180	57	0,9	1	2	M270HF16	53000	Yes	0,44

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

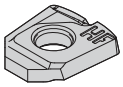
M270 High Feed • Toroidal • Screw-On • Metric

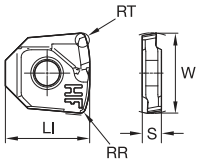


order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	Z U	insert 1	max RPM	coolant supply	kg
3926546	M270TD012M08	12	13	8,5	M8	42	25	10	0,6	1	2	M270HF12	55000	Yes	0,02
3926547	M270TD016M08	16	13	8,5	M8	47	30	10	0,9	1	2	M270HF16	53000	Yes	0,09

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
NOTE: All spare parts except the insert screws must be ordered separately.

M270 High Feed • HF





● first choice
○ alternate choice

P		○	●	●	●	
M			○	●	●	
K		●	○	○	○	●
N						
S				●	○	
H		●				●

catalogue number	W	LI	S	RR	RT	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270HF10	10,00	10,50	2,38	0,63	1,15	0,08	3903944	-	3903943	-	-
M270HF12	12,00	12,40	3,18	0,75	1,40	0,08	3903946	4145111	-	-	-
M270HF16	16,00	16,70	4,76	1,00	1,90	0,08	-	4145123	-	-	-

M270 High Feed • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	HF	TN6525	**HF**	**TN6540**	HF	TN6540
P3–P4	HF	TN6525	**HF**	**TN6540**	HF	TN6540
P5–P6	HF	TN6525	**HF**	**TN6540**	HF	TN6540
M1–M2	HF	TN6525	**HF**	**TN6540**	HF	TN6540
M3	HF	TN6525	**HF**	**TN6540**	HF	TN6540
K1–K2	HF	TN2505	**HF**	**TN6525**	–	–
K3	HF	TN2505	**HF**	**TN6525**	–	–
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	HF	TN6525	**HF**	**TN6540**	–	–
S3	HF	TN6525	**HF**	**TN6540**	–	–
S4	HF	TN6525	**HF**	**TN6540**	HF	TN6540
H1	HF	TN2505	**HF**	**TN2505**	HF	TN6525

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M270 High Feed • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540			WP35CM			WU10PM		
P	1	550	**420**	360	410	**320**	280	360	**280**	240	455	**395**	**370**	–	–	–
	2	320	**240**	205	320	**250**	215	250	**190**	170	280	**255**	230	–	–	–
	3	320	**240**	205	280	**215**	185	215	**170**	140	255	**230**	205	–	–	–
	4	–	–	–	235	**170**	145	180	**130**	110	190	**175**	160	–	–	–
	5	–	–	–	310	**235**	200	240	**180**	150	260	**230**	210	–	–	–
	6	–	–	–	205	**160**	130	160	**120**	100	160	**135**	110	–	–	–
M	1	–	–	–	190	**120**	80	130	**80**	60	205	**185**	155	–	–	–
	2	–	–	–	120	**80**	50	80	**50**	40	185	**160**	140	–	–	–
	3	–	–	–	125	**80**	55	85	**50**	40	145	**130**	115	–	–	–
K	1	400	**300**	250	275	**245**	220	220	**205**	180	295	**265**	240	295	**265**	240
	2	540	**365**	280	215	**190**	180	175	**155**	140	235	**210**	190	230	**205**	190
	3	310	**190**	155	180	**160**	145	155	**145**	125	195	**175**	160	195	**175**	160
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**35**	30	–	–	–	–	–	–
	2	–	–	–	–	–	–	25	**20**	10	–	–	–	–	–	–
	3	–	–	–	–	–	–	70	**40**	30	–	–	–	–	–	–
	4	–	–	–	–	–	–	60	**30**	25	66	**50**	33	–	–	–
H	1	175	**140**	95	–	–	–	–	–	–	–	–	–	160	**130**	90
	2	175	**140**	95	–	–	–	–	–	–	–	–	–	–	–	–
	3	140	**115**	80	–	–	–	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

M270 High Feed • HF10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
HF	1,01	**1,57**	–	0,67	**0,97**	1,41	0,48	**0,69**	0,97	0,42	**0,59**	0,83	0,38	**0,54**	0,75	HF

NOTE: Use "Light Machining" value as starting feed rate.

M270 High Feed • HF12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
HF	0,91	**1,53**	2,81	0,61	**0,96**	1,43	0,45	**0,69**	0,99	0,39	**0,59**	0,85	0,35	**0,54**	0,77	HF

NOTE: Use "Light Machining" value as starting feed rate.

M270 High Feed • HF16 • Recommended Starting Feeds [mm]

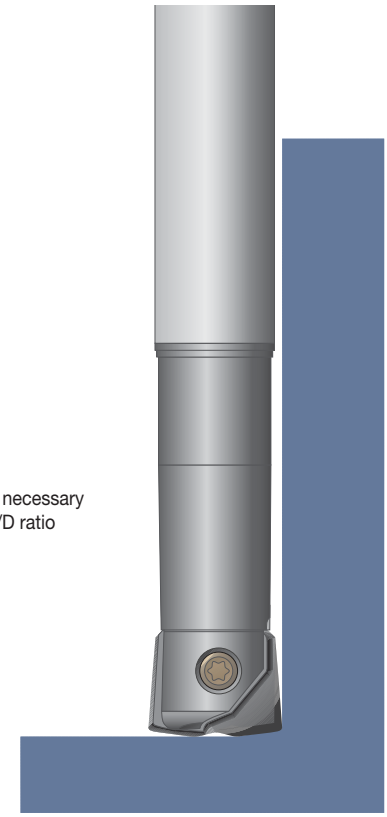
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
HF	1,03	**1,60**	3,34	0,69	**1,00**	1,50	0,50	**0,71**	1,03	0,43	**0,61**	0,88	0,39	**0,56**	0,80	HF

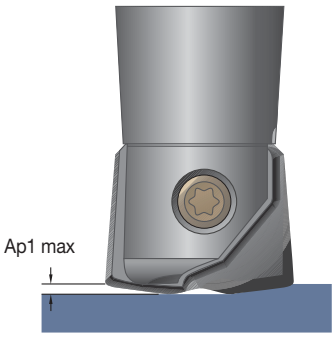
NOTE: Use "Light Machining" value as starting feed rate.

Applying High-Feed Tools

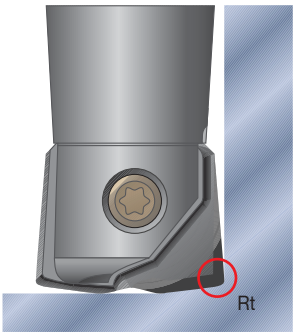
The high-feed concept bases its strategy in small depth of cut and high fz values, which results in a higher MRR and productivity with low radial forces.



Recommended when long overhang is necessary due to lower radial forces. Maximum L/D ratio of 10 x D.



Small Ap1 values and higher feed rate generate lower cutting forces versus traditional milling strategies.



For CAM programming, the tools can be programmed as a toroidal tool type by using the Rt value as the insert radius.

L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<4	0%	0%
4<L/D<7	55–65%	10–15%
>8	65–75%	20–30%

General Programming Information for Applying M270 High Feed

tool diameter	Ø10	Ø12	Ø13	Ø16	Ø17	Ø20
recommended starting Ap1 (mm)	0,40	0,40	0,40	0,60	0,60	0,75
Rt CAM programming	1,15	1,40	1,40	1,90	1,90	2,30
fz recommended for general purpose	0,45	0,55	0,55	0,60	0,60	0,70
fz recommended for 45 HRC (approx.)	0,40	0,45	0,45	0,55	0,55	0,65
fz recommended for 55 HRC (approx.)	0,30	0,35	0,35	0,45	0,45	0,50

NOTE: Use two effective teeth for feed calculations.
For materials above 45 HRC, we recommend adjusting the ae max to 55% of cutting diameter and using no more than 50% of Ap1 max.
While center cutting is possible, we recommend using a ramp angle of 0.5°–1.0° to ensure smooth operation.

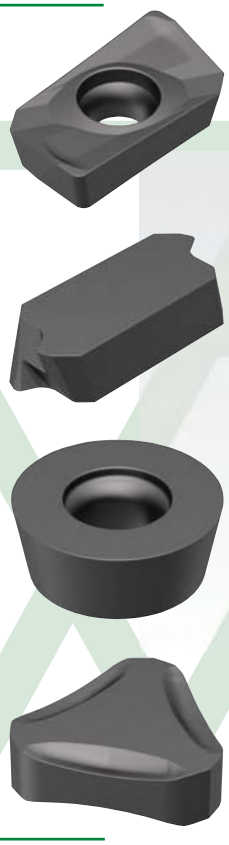
Use general milling and ISO inserts in the latest WIDIA™ grades as an economical solution for improved productivity in face milling, shoulder milling, and copy milling applications.

Inserts offered in pressed and sintered to size (PSTS) and ground versions for economical and precise solutions.

Available in the latest Victory™ grades: WK15CM, WP35CM, and WU20PM.

Inserts can be used in existing tool bodies for lower tooling costs.

Materials include all types of steel, stainless steel, cast iron, and nodular iron.



The general milling and ISO inserts are cost-effective inserts that provide higher performance for applications in automotive, heavy equipment, railroad components, and general engineering parts.

WK15CM

K

WK15CM is a wear-resistant grade with balanced toughness for general milling of cast irons. Best results in dry machining, but can also be used wet.

WP35CM

P K

WP35CM has a wide range of applications in general and rough milling of steels and cast iron. Performs best in dry, but can also be used under wet conditions.

WU20PM

P M K N S H

WU20PM is a universal grade for machining of steel, stainless steel, and high-temperature alloys. Also suitable for machining of gray and nodular irons. Resists breakage and offers improved wear resistance and increased strength. Can be used for both dry and wet machining.

HIGHER PERFORMANCE AT LOWER COST

PRODUCT

SERIES
General Milling/
ISO Inserts

INDUSTRY

TRANSPORTATION

GENERAL ENGINEERING

ENERGY

APPLICATIONS

FACE MILLING

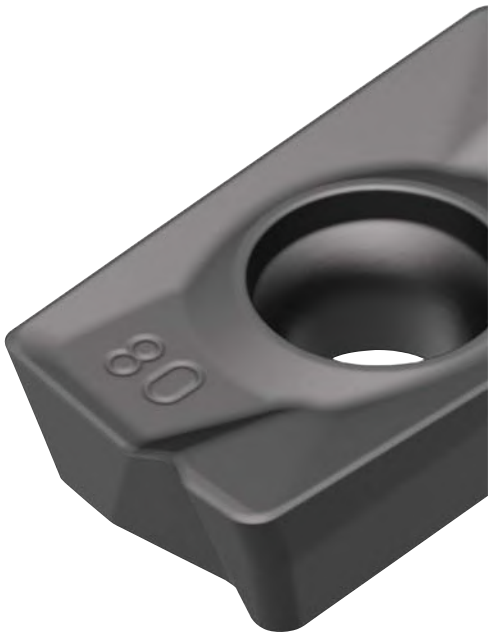
SIDE MILLING/ SHOULDER MILLING

PERFORMANCE

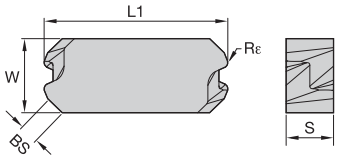
Using proven WIDIA™ grades, improve productivity in all types of steel, stainless steel, cast iron, and nodular iron workpiece materials.

COST EFFECTIVE

Inserts can be used in existing cutter bodies reducing tooling costs.



Indexable Milling • Face Milling ISO Inserts • LNCX

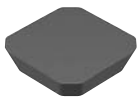


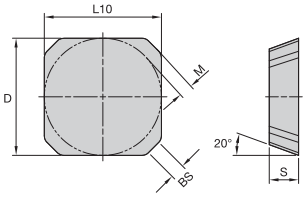
● first choice
○ alternate choice

P	●	
M	●	
K	○	●
N		
S	○	
H		

ISO catalogue number	cutting edges	W	S	BS	Rε	hm	WP35CM	WK15CM
LNCX1806AZR11	4	10,00	6,40	2,16	0,75	0,05	-	5343199
LNCX1806AZR11	4	10,00	6,40	2,16	0,75	0,06	6852433	-

Indexable Milling • Face Milling ISO Inserts • SEAN-1 • SE1203..



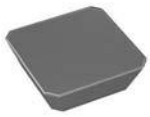


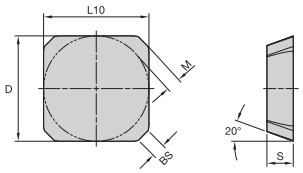
● first choice
○ alternate choice

P	●	
M	○	
K	○	○
N		●
S		
H		

catalogue number	cutting edges	D	L10	M	S	BS	hm	TTI25	THM
SEAN1203AFN1	4	12,70	12,70	1,66	3,18	1,65	0,10	2028344	-
SEAN1203AFN	4	12,70	12,70	1,43	3,18	1,57	0,02	-	6870582

Indexable Milling • Face Milling ISO Inserts • SEKN-1 • SE1203..



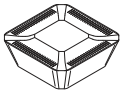


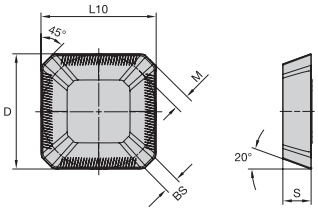
● first choice
○ alternate choice

P		●	●		●	
M		●	○		●	
K		○	○	○	○	●
N				●		
S		●			○	
H						

catalogue number	cutting edges	D	L10	M	S	BS	hm	TN6540	TTI25	THM	WP35CM	WK15CM
SEKN1203AFN1	4	12,70	12,70	1,66	3,18	1,65	0,14	3065464	2028349	2028350	-	5427318
SEKN1203AFN1	4	12,70	12,70	1,66	3,18	1,65	—	-	-	-	6923425	-
SEKN1203AFN	4	12,70	12,70	1,66	3,18	1,65	0,02	-	-	2562668	-	-
SEKN1203AFN	4	12,70	12,70	1,66	3,18	1,65	0,05	-	-	-	6877205	-

Indexable Milling • Face Milling ISO Inserts • SEKR-MS • SE1203....



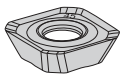


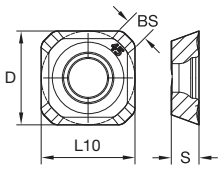
● first choice
○ alternate choice

P		●	●
M		●	●
K	○	○	○
N	○	○	
S	○	○	○
H		○	

catalogue number	cutting edges	D	L10	M	S	BS	hm	THR	WU20PM	WP35CM
SEKR1203AFNMS	4	12,70	12,70	1,66	3,10	1,65	0,14	2012927	-	-
SEKR1203AFNMS	4	12,70	12,70	1,66	3,10	1,65	0,04	-	-	6901194
SEKR1203AFNMS	4	12,70	12,70	1,66	3,10	1,65	0,05	-	2415793	-
SEKR1204AFNMS	4	12,70	12,70	1,66	4,76	1,65	—	-	-	6856937
SEKR1504AFNMS	4	15,88	15,88	2,25	4,76	1,90	0,13	-	-	6901200

Indexable Milling • Face Milling ISO Inserts • SEPT



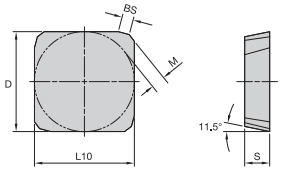


● first choice
○ alternate choice

P		●	●
M		○	●
K		○	○
N			
S			●
H			

catalogue number	cutting edges	D	L10	S	BS	TN6525	TN6540
SEPT13T3AGENMM	4	13,41	13,41	3,96	2,50	4072174	4072175

Indexable Milling • Face Milling ISO Inserts • SP..

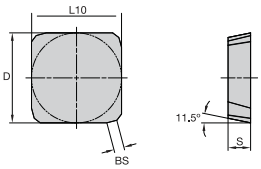


● first choice
○ alternate choice

P		●		●
M		●		●
K	○	○	●	○
N	●			○
S		○		○
H				○

catalogue number	cutting edges	D	L10	M	S	BS	hm	THM	WP35CM	WK15CM	WU20PM
SPKN1203EDL_WK15CM	4	12,70	12,70	0,90	3,18	1,42	0,06	-	-	5427378	-
SPKN1203EDL	4	12,70	12,70	1,80	3,18	1,03	0,02	2557236	-	-	-
SPKN1203EDL	4	12,70	12,70	1,80	3,18	1,03	0,05	-	6877206	5898252	2557226
SPKN1203EDR_WK15CM	4	12,70	12,70	0,90	3,18	1,42	0,06	-	-	5427376	-
SPKN1203EDR	4	12,70	12,70	1,80	3,18	1,03	0,02	2557306	-	-	-
SPKN1203EDR THM	4	12,70	12,70	0,90	3,18	1,42	0,06	2028510	-	-	-
SPKN1203EDR	4	12,70	12,70	1,80	3,18	1,03	0,05	-	6872920	5630205	2557291
SPKN1203EDTR	4	12,70	12,70	0,90	3,17	1,43	–	-	6923426	-	-
SPKN1504EDL	4	15,88	15,88	2,48	4,76	0,94	0,02	2557207	-	-	-
SPKN1504EDL	4	15,88	15,88	2,48	4,76	0,94	0,06	-	6877207	-	-
SPKN1504EDR	4	15,88	15,88	2,48	4,76	0,94	0,02	2557266	-	-	-
SPKN1504EDR	4	15,88	15,88	1,25	4,76	1,42	0,08	-	-	5427379	-
SPKN1504EDR	4	15,88	15,88	2,48	4,76	0,94	0,05	-	6801237	-	-
SPKN1504EDR	4	15,88	15,88	2,48	4,76	0,94	0,07	-	-	-	2557256

Indexable Milling • Face Milling ISO Inserts • SPAN

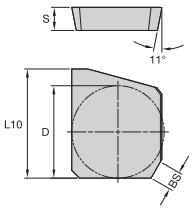


● first choice
○ alternate choice

P	●	●
M	●	●
K	○	○
N		○
S	○	○
H		○

ISO catalogue number	cutting edges	D	L10	S	BS	hm	WP35CM	WU20PM
SPAN1203EDL	4	13	12,70	3,18	1,03	0,05	-	3997503
SPAN1203EDR	4	13	12,70	3,18	1,03	0,05	6877203	-
SPAN1203EDR	4	13	12,70	3,18	1,03	0,06	-	2557457

Indexable Milling • Face Milling ISO Inserts • SPCX

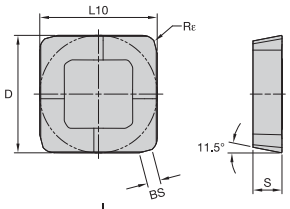


● first choice
○ alternate choice

P		
M		
K		●
N		●
S		
H		

ISO catalogue number	cutting edges	D	L10	S	hm	THM-F
SPCX1203EDL	1	13	15,00	3,18	0,02	2557024
SPCX1203EDR	1	13	15,00	3,18	0,02	2557061

Indexable Milling • Face Milling ISO Inserts • SPKR

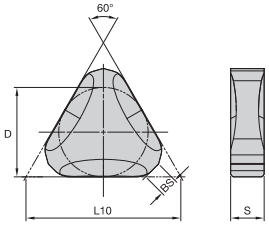


● first choice
○ alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WU20PM
SPKR1203EDLMS	4	13	12,70	3,18	1,40	1,60	0,05	2558319
SPKR1203EDRMS	4	13	12,70	3,18	1,40	1,60	0,05	2561005

Indexable Milling • Face Milling ISO Inserts • TNHF

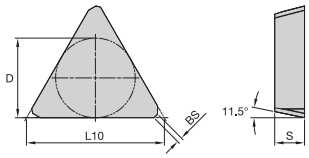


● first choice
○ alternate choice

P	
M	
K	●
N	
S	
H	

ISO catalogue number	cutting edges	D	L10	S	BS	hm	WK15CM
TNHF1204ANCA	6	13	22,00	4,76	2,58	0,05	6008686

Indexable Milling • Face Milling ISO Inserts • TPAN

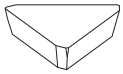


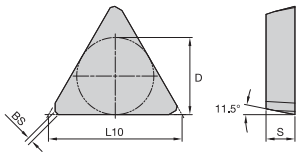
● first choice
○ alternate choice

P	●	●
M	●	●
K	○	○
N		○
S	○	○
H		○

ISO catalogue number	cutting edges	D	L10	S	BS	hm	WP35CM	WU20PM
TPAN1103PPN	3	6	10,96	3,18	0,71	0,04	6877241	2557715
TPAN1603PDR	3	10	16,45	3,18	0,03	0,05	6877242	2568655
TPAN1603PPN	3	10	16,45	3,18	1,17	0,05	6877204	2557665
TPAN2204PPN	3	13	21,96	4,76	1,24	0,06	6877210	6869240
TPAN2204PDR	3	13	21,96	4,76	1,35	0,06	6801236	-
TPAN2204PDR	3	13	21,96	4,76	1,35	0,07	-	2557789
TPAN22T3AER	3	13	22,49	3,97	2,11	0,06	6877243	-

Indexable Milling • Face Milling ISO Inserts • TPKN



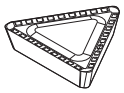


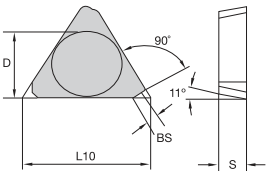
● first choice
○ alternate choice

P	●		●
M	●		●
K	○	●	○
N			○
S	○		○
H			○

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WP35CM	WK15CM	WU20PM
TPKN1603PDR	3	10	16,45	3,18	1,29	–	0,05	-	-	3865253
TPKN1603PPN	3	10	16,50	3,18	1,20	–	0,05	6877208	-	-
TPKN1603PDR	3	10	16,50	3,18	1,22	1,10	0,13	6901195	-	-
TPKN2204PDL	3	13	21,95	4,76	0,72	–	0,05	-	-	2557538
TPKN2204PDR	3	13	21,95	4,76	0,72	–	0,05	-	-	2557571
TPKN2204PDR	3	13	21,95	4,76	0,72	–	0,06	6873002	-	-
TPKN2204PDL	3	13	21,95	4,76	0,72	–	0,06	6877209	-	-
TPKN2204PDR	3	13	21,95	4,76	0,72	–	0,18	-	5427377	-

Indexable Milling • Face Milling ISO Inserts • TPKR-MS



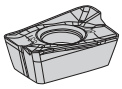


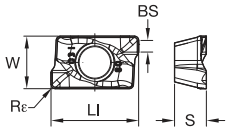
● first choice
○ alternate choice

P		●	●	●
M			●	●
K	○		○	○
N	●			○
S			○	○
H				○

ISO catalogue number	cutting edges	D	L10	S	BS	hm	THM	TTM08	WP35CM	WU20PM
TPKR1603PDRMS	3	10	16,50	3,18	1,40	0,04	5107759	-	6901196	-
TPKR1603PDRMS	3	10	16,50	3,18	1,40	0,05	-	-	-	4120195
TPKR1603PDRMS	3	10	16,50	3,18	1,40	0,10	-	2014835	-	-

Indexable Milling • Shoulder Milling ISO Inserts • ADPT



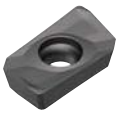


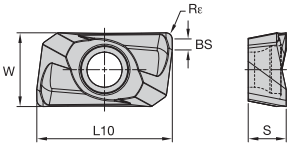
● first choice
○ alternate choice

P		●
M		●
K		○
N		
S		●
H		

catalogue number	cutting edges	W	LI	S	BS	Rε	TN6540
ADPT150508ERMM	2	9,65	16,12	5,84	2,13	0,79	4071302

Indexable Milling • Shoulder Milling ISO Inserts • APMT



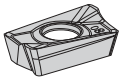


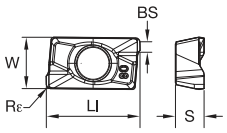
● first choice
○ alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	L10	W	S	BS	Rε	hm	WU20PM
APMT1135PDR	2	11,20	5,95	3,50	–	0,80	0,05	6196890
APMT1604PDR	2	17,00	9,24	4,76	1,38	0,80	0,05	6196991

Indexable Milling • Shoulder Milling ISO Inserts • APPT



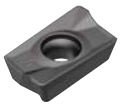


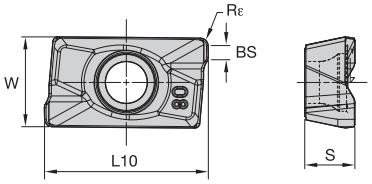
● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

catalogue number	cutting edges	W	Ll	S	BS	Rε	TN6540
APPT160408PDERMM	2	9,43	17,24	5,26	1,47	0,79	4071254
APPT160408PDSRMM	2	9,41	17,20	5,26	1,49	0,79	4071257
APPT160416PDERMM	2	9,43	17,22	5,27	1,43	1,59	4071259
APPT160432PDERMM	2	9,44	16,87	5,26	–	3,18	4071265

Indexable Milling • Shoulder Milling ISO Inserts • APPT-MM



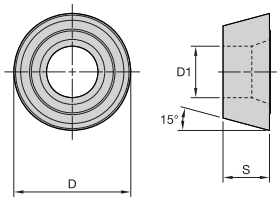


● first choice
○ alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	L10	W	S	BS	Rε	hm	WU20PM
APPT100308PDSRMM	2	11,10	6,70	3,56	–	0,80	0,07	6820930
APPT160408PDSRMM	2	–	9,41	5,26	1,49	0,79	0,06	6443662

Indexable Milling • Copy Milling ISO Inserts • RDMX

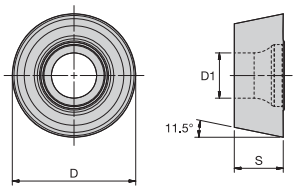


● first choice
○ alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D1	D	S	hm	WU20PM
RDMX10T3M0	1	4,40	10	3,97	0,05	2567081
RDMX1604M0T	1	5,50	16	4,76	0,06	4147744

Indexable Milling • Copy Milling ISO Inserts • RPMT

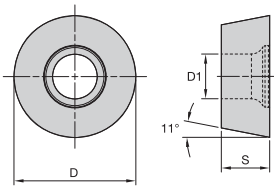


● first choice
○ alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D1	D	S	hm	WU20PM
RPMT1204M0	1	4,40	12	4,76	0,05	4144073

Indexable Milling • Copy Milling ISO Inserts • RPMW



● first choice
○ alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D1	D	S	hm	WU20PM
RPMW1003M0	1	4,60	10	3,18	0,05	3367756
RPMW1204M0	1	4,40	12	4,76	0,05	3350976

widia.com

WIDIA™

Solid End Milling

WIDIA Multi-Purpose End Mills B4–B63

Selection Guide B4–B15

WCE End Mill • 4 Flute B16–B24

GP End Mills • 2 Flute, 3 Flute, and 4 Flute B26–B54

NINA B56–B63

Hanita High-Performance Solid Carbide End Mills B68–B199

Selection Guide B68–B83

VariMill XTREME B84–B92

VariMill I B94–B104

VariMill II B106–B118

VariMill III ER B120–B124

Roughers B126–B138

Finishers B140–B149

ALUFLASH B150–B160

X-Feed B162–B167

Vision Plus B168–B192

HSS End Mills B194–B199

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio					
	WCE4	WCE4	WCE4	WCE4	WCE4	WCE4
UOM	Metric	Metric	Metric	Metric	Metric	Metric
Series	W401	W401	W401	W401	W4N1	W411
Page	B18	B18	B19	B19	B20	B21
Flute	4	4	4	4	4	4
Diameter D1	3—20mm	3—20mm	3—20mm	3—20mm	3—20mm	6—20mm
Shank						
Length of Cut	Regular	Regular	Regular	Regular	Regular	Long
Corner Style						
Chamfer Size	—	—	0,40—0,50mm	0,40—0,50mm	—	0,40—0,50mm
Radius Sizes	—	—	—	—	0,2–3mm	—
Helix Angle	37° / 39°	37° / 39°	37° / 39°	37° / 39°	37° / 39°	37° / 39°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	Yes	No
Materials	P M K S H	P M K S H	P M K S H	P M K S H	P M K S H	P M K S H

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio	
	WCE4	WCE4
UOM	Metric	Metric
Series	W4NB	W4NB
Page	B21	B22
Flute	4	4
Diameter D1	5—20mm	5—20mm
Shank		
Length of Cut	Regular	Regular
Corner Style		
Chamfer Size	—	—
Radius Sizes	—	—
Helix Angle	38°	38°
Center Cutting	Yes	Yes
Neck	Yes	Yes
Materials	P M K S H	P M K S H

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio					
	GP	GP	GP	GP	GP	GP
UOM	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series	**4002**	**4002**	**4012**	**4012**	**D002**	**D002**
Page	B28–B29	B28–B29	B28–B29	B28–B29	B30	B30
Flute	2	2	2	2	2	2
Diameter D1	1—20mm	1—20mm	1—20mm	1—20mm	2—20mm	2—20mm
Shank						
Length of Cut	Regular	Regular	Long	Long	Regular	Regular
Corner Style						
Chamfer Size	—	0,1—0,3mm	—	0,1—0,3mm	—	0,1—0,3mm
Radius Sizes	—	—	—	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	D002	D002	D002	D002	D002	D002	2819
Page	B30	B30	B30	B30	B30	B30	B31
Flute	2	2	2	2	2	2	2
Diameter D1	12—20mm	12—20mm	2,5—20mm	2,5—20mm	2,5—20mm	2,5—20mm	3—20mm
Shank							
Length of Cut	Regular	Regular	Regular	Regular	Regular	Regular	Regular
Corner Style							
Chamfer Size	—	0,1—0,3mm	—	0,1—0,3mm	—	0,1—0,3mm	—
Radius Sizes	—	—	—	—	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	2819	4001	4011	4021	D001	D011	2838
Page	B31	B32	B32	B32	B33	B33	B33
Flute	2	2	2	2	2	2	2
Diameter D1	3—20mm	1—20mm	1—20mm	1—20mm	2—20mm	3—20mm	2—16mm
Shank							
Length of Cut	Regular	Regular	Long	Extended	Regular	Long	Regular
Corner Style							
Chamfer Size	0,1—0,3mm	—	—	—	—	—	—
Radius Sizes	—	—	—	—	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	4003..S	4003..S	4013..S	4013..S	4003	4003	4013
Page	B34	B34	B34	B34	B35	B35	B35
Flute	3	3	3	3	3	3	3
Diameter D1	1—20mm	6—16mm	3—20mm	3—20mm	4—16mm	6—16mm	4—20mm
Shank							
Length of Cut	Reguar	Regular	Regular	Regular	Regular	Regular	Long
Corner Style							
Chamfer Size	—	—	—	—	—	—	—
Radius Sizes	—	—	—	—	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	4013	D003..S	D003..S	D013..S	D013..S	D003	D003
Page	B35	B36	B36	B36	B36	B37	B37
Flute	3	3	3	3	3	3	3
Diameter D1	5—20mm	2—20mm	2—20mm	2—20mm	2—20mm	4—20mm	4—20mm
Shank							
Length of Cut	Long	Regular	Regular	Long	Long	Regular	Regular
Corner Style							
Chamfer Size	—	—	—	—	—	0,1—0,3mm	0,1—0,3mm
Radius Sizes	—	—	—	—	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	D013	D013	4004	4004	4004	4014	4014
Page	B37	B37	B38–B39	B38–B39	B40	B40	B40
Flute	3	3	4	4	4	4	4
Diameter D1	4—20mm	4—20mm	1—20mm	1—20mm	2—20mm	3—20mm	3—20mm
Shank							
Length of Cut	Long	Long	Regular	Regular	Regular	Long	Long
Corner Style							
Chamfer Size	0,1—0,3mm	0,1—0,3mm	—	0,1—0,3mm	—	—	0,1—0,3mm
Radius Sizes	—	—	—	—	0,5–1mm	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	4014	4024	4024	4024	D004	D004	D004
Page	B40	B40	B40	B40	B41–B42	B41–B42	B41–B42
Flute	4	4	4	4	4	4	4
Diameter D1	3—20mm	3—20mm	3—20mm	3—20mm	2—20mm	4—20mm	12—20mm
Shank							
Length of Cut	Long	Extended	Extended	Extended	Regular	Regular	Regular
Corner Style							
Chamfer Size	—	—	0,1—0,3mm	—	—	0,1—0,3mm	—
Radius Sizes	0,5—1mm	—	—	0,5—1mm	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio						
	GP	GP	GP	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series	D004	D014	D014	D014	D014	2528	2528
Page	B41–B42	B41–B42	B41–B42	B41–B42	B41–B42	B43	B43
Flute	4	4	4	4	4	4	4
Diameter D1	12—20mm	2—20mm	4—20mm	12—20mm	12—20mm	4—20mm	4—20mm
Shank							
Length of Cut	Regular	Long	Long	Long	Long	Regular	Regular
Corner Style							
Chamfer Size	0,1—0,3mm	—	0,1—0,3mm	—	0,1—0,3mm	—	0,1—0,3mm
Radius Sizes	—	—	—	—	—	—	—
Helix Angle	30°	30°	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio			
	GP	GP	GP	GP
UOM	Metric	Metric	Metric	Metric
Series	4000	4010	D010	2848
Page	B44	B44	B45	B46
Flute	4	4	4	4
Diameter D1	2—20mm	3—20mm	3—20mm	4—20mm
Shank				
Length of Cut	Regular	Long	Regular	Regular
Corner Style				
Chamfer Size	—	—	—	—
Radius Sizes	—	—	—	—
Helix Angle	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes
Neck	No	No	No	No
Materials	P M K N	P M K N	P M K N	P M K N

Multi-Purpose End Mills • Selection Guide • Metric

	WIDIA Solid End Milling Portfolio				
	NINA™	NINA	NINA	NINA	NINA
UOM	Metric	Metric	Metric	Metric	Metric
Series	423002	423004	423048	423039	423036
Page	B58	B58	B59	B59	B60
Flute	3	4	2	2	4
Diameter D1	2—12mm	4—12mm	3—4mm	2—12mm	6—10mm
Shank					
Length of Cut	Regular	Regular	Regular	Regular	Regular
Corner Style					
Chamfer Size	—	0,4—0,5mm	—	—	—
Radius Sizes	—	—	0.5	—	—
Helix Angle	30°	30°	30°	30°	30°
Center Cutting	Yes	Yes	Yes	Yes	Yes
Neck	No	No	No	No	No
Materials	P M K N S	P M K N S	P M K N S	P M K N S	P M K N S

WCE End Mill

Versatile Solid Carbide End Mills • Roughing/Finishing

The WCE solid end milling line features an advanced geometry to enable material versatility for end users seeking a cost-effective solution while machining small batches.

WCE4, 4-flute geometry combines the asymmetrical index and variable helix features at an affordable price while ensuring material and application versatility, including demanding operations like full slots and heavy cuts.

VERSATILE

Designed for use on multiple materials, including steel, stainless steel, and cast iron.

RELIABLE

Advanced design, coating, and geometry — including asymmetrical index and variable helix — combined to improve performance and offer consistent tool life.

AFFORDABLE

Attractively priced for small-to-medium shops that change machine setup often and need to know they can count on the tool without worrying about specific geometries or grades.

AFFORDABLE PERFORMANCE

PRODUCT

GRADE

WU20PD

FLUTES

4

DIAMETER RANGE

3–20mm

CORNER CONDITIONS

Sharp Edges
Chamfered
Radiused
Ball Nose

INDUSTRY

GENERAL ENGINEERING

MATERIALS

FIRST CHOICE

P M K

SECOND CHOICE

S

APPLICATIONS

SIDE/ SHOULDER MILLING ROUGHING

SLOTTING SQUARE END

HELICAL MILLING

RAMPING BLANK

PLUNGE MILLING

3D PROFILING

VARIABLE HELIX

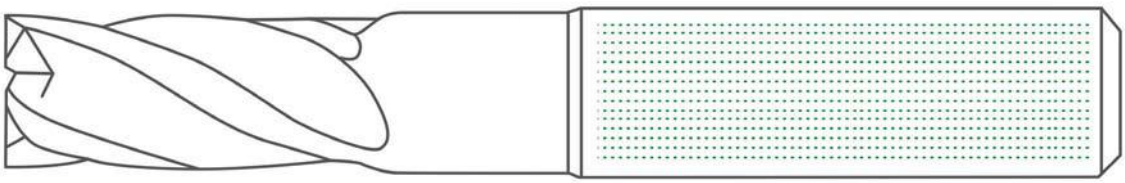
to reduce vibrations and increase overall cutting stability.

ECCENTRIC RELIEF

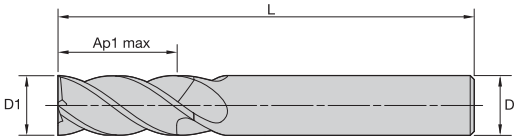
to provide vibration dampening and increase tool life on stainless steels.

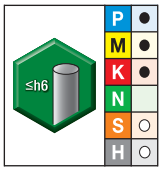
CORE TAPER

for improved chip evacuation and tool stability.



WCE4 • Series W401 • Sharp Edge • 4 Flute • Cylindrical Shank • Metric



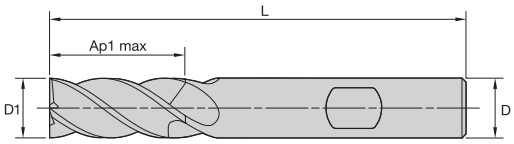


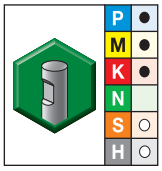
● first choice
○ alternate choice

WU20PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
6945502	W401M03003SZT	3,0	6	8,00	57	4
6945503	W401M04003SZT	4,0	6	11,00	57	4
6945504	W401M05003SZT	5,0	6	13,00	57	4
6945505	W401M06003SZT	6,0	6	13,00	57	4
6945548	W401M08004SZT	8,0	8	19,00	63	4
6945549	W401M10005SZT	10,0	10	22,00	72	4
6945684	W401M12006SZT	12,0	12	26,00	83	4
6945685	W401M16008SZT	16,0	16	32,00	92	4
6945686	W401M20009SZT	20,0	20	38,00	104	4

WCE4 • Series W401 • Sharp Edge • 4 Flute • Weldon® Shank • Metric



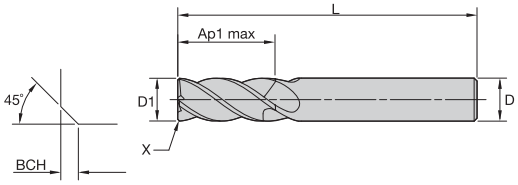


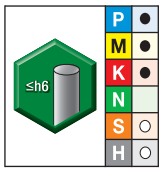
● first choice
○ alternate choice

WU20PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
6945510	W401M03003SZW	3,0	6	8,00	57	4
6945541	W401M04003SZW	4,0	6	11,00	57	4
6945542	W401M05003SZW	5,0	6	13,00	57	4
6945543	W401M06003SZW	6,0	6	13,00	57	4
6945562	W401M08004SZW	8,0	8	19,00	63	4
6945563	W401M10005SZW	10,0	10	22,00	72	4
6945690	W401M12006SZW	12,0	12	26,00	83	4
6945691	W401M16008SZW	16,0	16	32,00	92	4
6945692	W401M20009SZW	20,0	20	38,00	104	4

WCE4 • Series W401 • Chamfered • 4 Flute • Cylindrical Shank • Metric



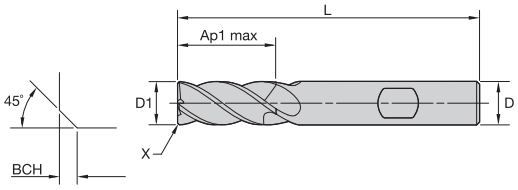


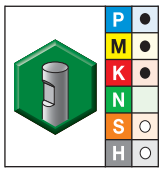
● first choice
○ alternate choice

WU20PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
6945506	W401M03003CAT	3,0	6	8,00	57	0,20	4
6945507	W401M04003CAT	4,0	6	11,00	57	0,20	4
6945508	W401M05003CAT	5,0	6	13,00	57	0,30	4
6945509	W401M06003CAT	6,0	6	13,00	57	0,40	4
6945550	W401M08004CAT	8,0	8	19,00	63	0,40	4
6945561	W401M10005CET	10,0	10	22,00	72	0,50	4
6945687	W401M12006CET	12,0	12	26,00	83	0,50	4
6945688	W401M16008CET	16,0	16	32,00	92	0,50	4
6945689	W401M20009CET	20,0	20	38,00	104	0,50	4

WCE4 • Series W401 • Chamfered • 4 Flute • Weldon® Shank • Metric



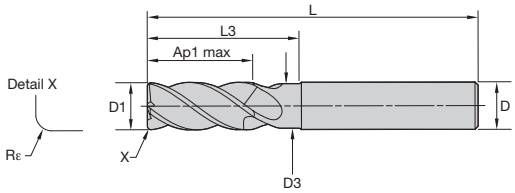


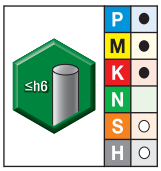
● first choice
○ alternate choice

WU20PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
6945544	W401M03003CAW	3,0	6	8,00	57	0,20	4
6945545	W401M04003CAW	4,0	6	11,00	57	0,20	4
6945546	W401M05003CAW	5,0	6	13,00	57	0,30	4
6945547	W401M06003CAW	6,0	6	13,00	57	0,40	4
6945564	W401M08004CAW	8,0	8	19,00	63	0,40	4
6945565	W401M10005CEW	10,0	10	22,00	72	0,50	4
6945693	W401M12006CEW	12,0	12	26,00	83	0,50	4
6945694	W401M16008CEW	16,0	16	32,00	92	0,50	4
6945695	W401M20009CEW	20,0	20	38,00	104	0,50	4

WCE4 • Series W4N1 • Radiused • 4 Flute • Necked • Cylindrical Shank • Metric



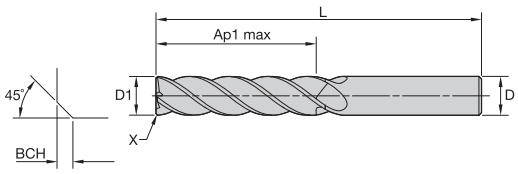


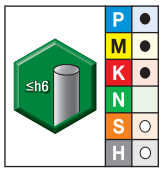
WU20PE

● first choice
○ alternate choice

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Rε	Z U
6945620	W4N1M03003RAT	3,0	6	2,82	8,00	57	15,00	0,20	4
6945631	W4N1M04003RAT	4,0	6	3,76	11,00	57	16,00	0,20	4
6945632	W4N1M04003RET	4,0	6	3,76	11,00	57	16,00	0,50	4
6945633	W4N1M05003RAT	5,0	6	4,70	13,00	57	18,00	0,20	4
6945634	W4N1M05003RET	5,0	6	4,70	13,00	57	18,00	0,50	4
6945635	W4N1M05003RJT	5,0	6	4,70	13,00	57	18,00	1,00	4
6945636	W4N1M06003RET	6,0	6	5,64	13,00	57	21,00	0,50	4
6945638	W4N1M06003RHT	6,0	6	5,64	13,00	57	21,00	1,50	4
6945637	W4N1M06003RJT	6,0	6	5,64	13,00	57	21,00	1,00	4
6945640	W4N1M08004RET	8,0	8	7,52	19,00	63	27,00	0,50	4
6945642	W4N1M08004RHT	8,0	8	7,52	19,00	63	27,00	1,50	4
6945641	W4N1M08004RJT	8,0	8	7,52	19,00	63	27,00	1,00	4
6945643	W4N1M08004RKT	8,0	8	7,52	19,00	63	27,00	2,00	4
6945644	W4N1M10005RET	10,0	10	9,40	22,00	72	32,00	0,50	4
6945646	W4N1M10005RHT	10,0	10	9,40	22,00	72	32,00	1,50	4
6945645	W4N1M10005RJT	10,0	10	9,40	22,00	72	32,00	1,00	4
6945647	W4N1M10005RKT	10,0	10	9,40	22,00	72	32,00	2,00	4
6945128	W4N1M12006RET	12,0	12	11,28	26,00	83	38,00	0,50	4
6945130	W4N1M12006RHT	12,0	12	11,28	26,00	83	38,00	1,50	4
6945129	W4N1M12006RJT	12,0	12	11,28	26,00	83	38,00	1,00	4
6945481	W4N1M12006RKT	12,0	12	11,28	26,00	83	38,00	2,00	4
6945482	W4N1M12006RQT	12,0	12	11,28	26,00	83	38,00	4,00	4
6945483	W4N1M16008RJT	16,0	16	15,04	32,00	92	44,00	1,00	4
6945484	W4N1M16008RKT	16,0	16	15,04	32,00	92	44,00	2,00	4
6945485	W4N1M16008RPT	16,0	16	15,04	32,00	92	44,00	3,00	4
6945486	W4N1M16008RQT	16,0	16	15,04	32,00	92	44,00	4,00	4
6945487	W4N1M20009RJT	20,0	20	18,80	38,00	104	53,00	1,00	4
6945488	W4N1M20009RKT	20,0	20	18,80	38,00	104	53,00	2,00	4
6945489	W4N1M20009RPT	20,0	20	18,80	38,00	104	53,00	3,00	4
6945490	W4N1M20009RQT	20,0	20	18,80	38,00	104	53,00	4,00	4

WCE4 • Series W411 • Chamfered • 4 Flute • Long Length • Cylindrical Shank • Metric



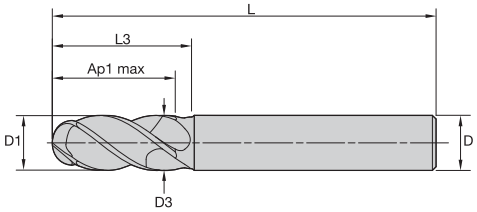


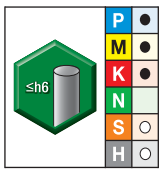
● first choice
○ alternate choice

WU20PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
6946013	W411M06013CAT	6,0	6	32,00	76	0,40	4
6946014	W411M08014CAT	8,0	8	32,00	87	0,40	4
6946015	W411M10015CET	10,0	10	38,00	89	0,50	4
6946046	W411M12016CET	12,0	12	51,00	100	0,50	4
6946047	W411M16018CET	16,0	16	57,00	125	0,50	4
6946048	W411M20019CET	20,0	20	57,00	125	0,50	4

WCE4 • Series W4NB • Ball Nose • 4 Flute • Cylindrical Shank • Metric



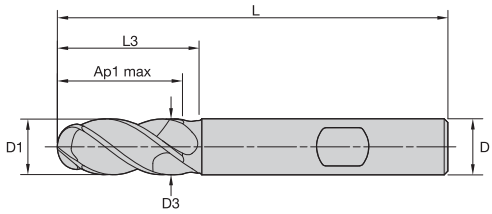


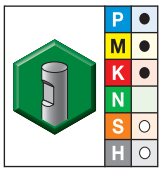
● first choice
○ alternate choice

WU20PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6945882	W4NBM05003RBT	5,0	6	4,70	13,00	57	18,00	4
6945883	W4NBM06003RBT	6,0	6	5,64	13,00	57	21,00	4
6945886	W4NBM08004RBT	8,0	8	7,52	19,00	63	27,00	4
6945887	W4NBM10005RBT	10,0	10	9,40	22,00	72	32,00	4
6945895	W4NBM12006RBT	12,0	12	11,28	26,00	83	30,00	4
6945896	W4NBM16008RBT	16,0	16	15,04	32,00	92	38,00	4
6945897	W4NBM20009RBT	20,0	20	18,80	38,00	104	50,00	4

WCE4 • Series W4NB • Ball Nose • 4 Flute • Weldon® Shank • Metric





WU20PE

● first choice
○ alternate choice

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6945884	W4NBM05003RBW	5,0	6	4,70	13,00	57	18,00	4
6945885	W4NBM06003RBW	6,0	6	5,64	13,00	57	21,00	4
6945888	W4NBM08004RBW	8,0	8	7,52	19,00	63	27,00	4
6945889	W4NBM10005RBW	10,0	10	9,40	22,00	72	32,00	4
6945898	W4NBM12006RBW	12,0	12	11,28	26,00	83	30,00	4
6945899	W4NBM16008RBW	16,0	16	15,04	32,00	92	38,00	4
6945900	W4NBM20009RBW	20,0	20	18,80	38,00	104	50,00	4

Application Data • WCE Side Milling • Slotting • Metric

Material Group		Side Milling ap	Side Milling ae	Slotting ap	WU20PE Cutting Speed — Vc m/min min	Start	max	mm	D1 — Diameter 3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
									Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
P	0	ap1max	0,4 x D1	1,0 x D1	150	**175**	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	ap1max	0,4 x D1	1,0 x D1	150	**175**	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,4 x D1	1,0 x D1	140	**165**	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	ap1max	0,4 x D1	1,0 x D1	120	**140**	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	ap1max	0,4 x D1	0,75 x D1	90	**120**	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	ap1max	0,4 x D1	1,0 x D1	60	**80**	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	ap1max	0,4 x D1	0,75 x D1	50	**65**	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	ap1max	0,4 x D1	1,0 x D1	90	**100**	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,4 x D1	1,0 x D1	60	**70**	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	ap1max	0,4 x D1	1,0 x D1	60	**65**	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	ap1max	0,4 x D1	1,0 x D1	120	**135**	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,4 x D1	1,0 x D1	110	**125**	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	ap1max	0,4 x D1	1,0 x D1	110	**120**	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	ap1max	0,4 x D1	0,3 x D1	50	**70**	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,4 x D1	0,3 x D1	25	**30**	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	ap1max	0,4 x D1	1,0 x D1	25	**30**	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	ap1max	0,4 x D1	1,0 x D1	50	**55**	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	ap1max	0,4 x D1	0,75 x D1	80	**110**	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	ap1max	0,4 x D1	0,5 x D1	70	**90**	120	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

Application Data • WCE Side Milling • Slotting BN • Metric

Material Group		Side Milling ap	Side Milling ae	Slotting ap	WU20PE Cutting Speed — Vc m/min min	Start	max	mm	D1 — Diameter 3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
									Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
P	0	ap1max	0,4 x D1	1,0 x D1	150	**175**	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	ap1max	0,4 x D1	1,0 x D1	150	**175**	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,4 x D1	1,0 x D1	140	**165**	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	ap1max	0,4 x D1	1,0 x D1	120	**140**	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	ap1max	0,4 x D1	0,75 x D1	90	**120**	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	ap1max	0,4 x D1	1,0 x D1	60	**80**	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	ap1max	0,4 x D1	0,75 x D1	50	**65**	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	ap1max	0,4 x D1	1,0 x D1	90	**100**	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,4 x D1	1,0 x D1	60	**70**	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	ap1max	0,4 x D1	1,0 x D1	60	**65**	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	ap1max	0,4 x D1	1,0 x D1	120	**135**	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,4 x D1	1,0 x D1	110	**125**	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	ap1max	0,4 x D1	1,0 x D1	110	**120**	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	ap1max	0,4 x D1	0,3 x D1	50	**70**	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,4 x D1	0,3 x D1	25	**30**	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	ap1max	0,4 x D1	1,0 x D1	25	**30**	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	ap1max	0,4 x D1	1,0 x D1	50	**55**	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	ap1max	0,4 x D1	0,75 x D1	80	**110**	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	ap1max	0,4 x D1	0,5 x D1	70	**90**	120	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

Application Data • WCE Side Milling • Long • Metric

Material Group		Side Milling		WU20PE			Recommended feed per tooth (fz = mm/z) for side milling. No Slotting operations recommended.												
				Cutting Speed — Vc m/min				D1 — Diameter											
		ap	ae	min	Start	max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	ap1max	0,2xD1	150	175	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	ap1max	0,2xD1	150	175	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,2xD1	140	165	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	ap1max	0,2xD1	120	140	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	ap1max	0,2xD1	90	120	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	ap1max	0,2xD1	60	80	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	ap1max	0,15xD1	50	65	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	ap1max	0,2xD1	90	100	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,2xD1	60	70	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	ap1max	0,2xD1	60	65	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	ap1max	0,2xD1	120	135	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,2xD1	110	125	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	ap1max	0,2xD1	110	120	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	ap1max	0,1xD1	50	70	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,1xD1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	ap1max	0,15xD1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	ap1max	0,15xD1	50	55	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	ap1max	0,15xD1	80	110	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	ap1max	0,15xD1	70	90	120	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

WCE • Adjustment Factor Table for Feed Calculation

To calculate application-specific cutting data, please use Kv coefficient table to the right for adaptation of cutting speed and KFz for feed, respectively.

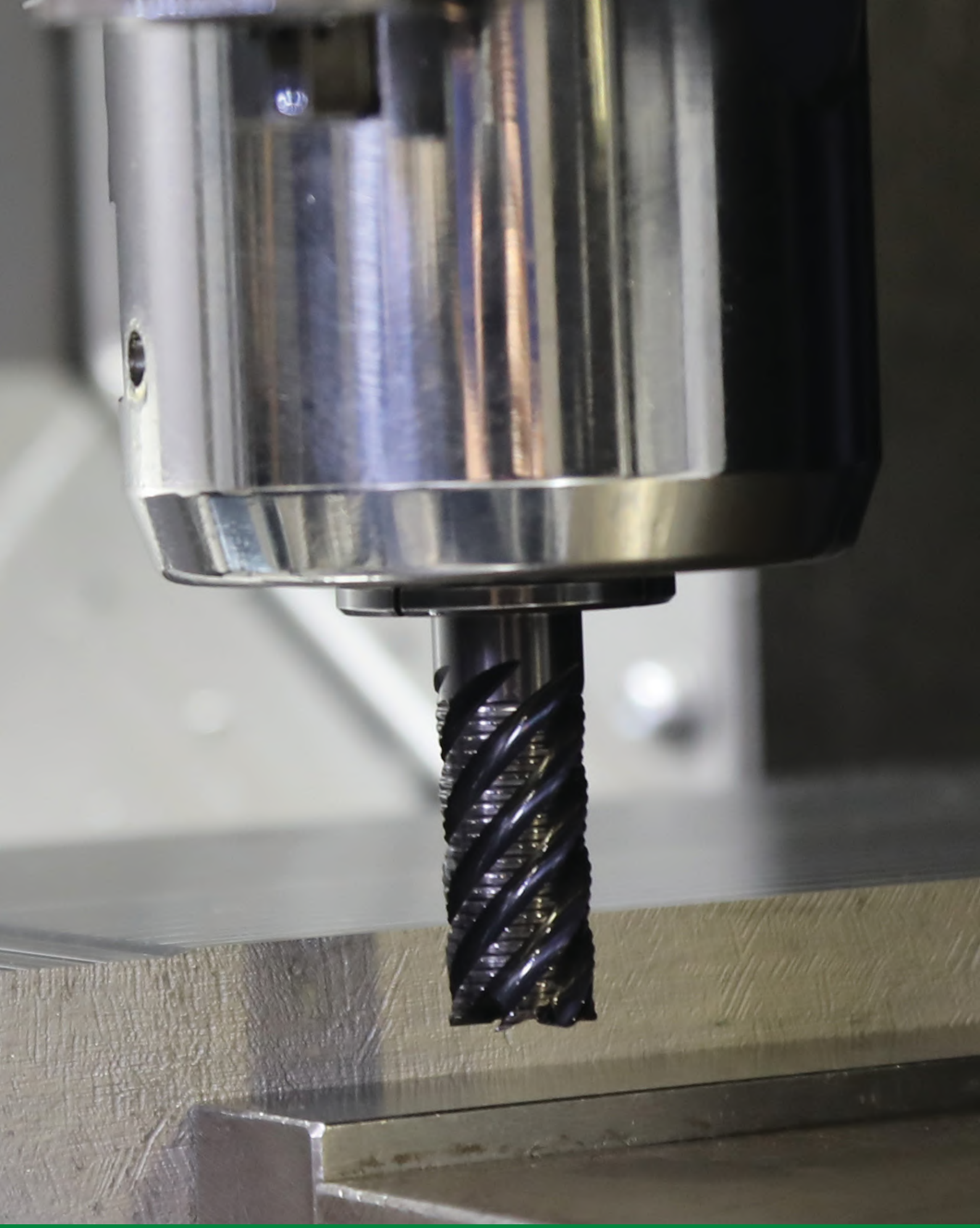
*Vc new = Vc * Kv*
*Fz new = IPT * KFz*

Calculation example:
Application: D = 20mm; M2 material group;
Ae = 2mm
Cutting data recommendation: Vc = 80 m/min;
Fz = 0,089 mm/th
Adjustment coefficients: Ae = 2mm equals 10,0%;
Kv = 1,35; KFz = 1,7

Final cutting data recommendation:
*Vc new = 80 * 1,35 = 108 m/min*
*Fz new = 0,089 * 1,7 = 0,15 mm/min*

Metric

	Ae/D	2%	4%	5%	8%	10%	20%	30%	40%	50%
Speed factor	Kv	2	1,5	1,45	1,4	1,35	1,25	1,2	1	1
Feed factor	KFz	2,4	2,3	2,2	2	1,7	1,25	1,02	1	1



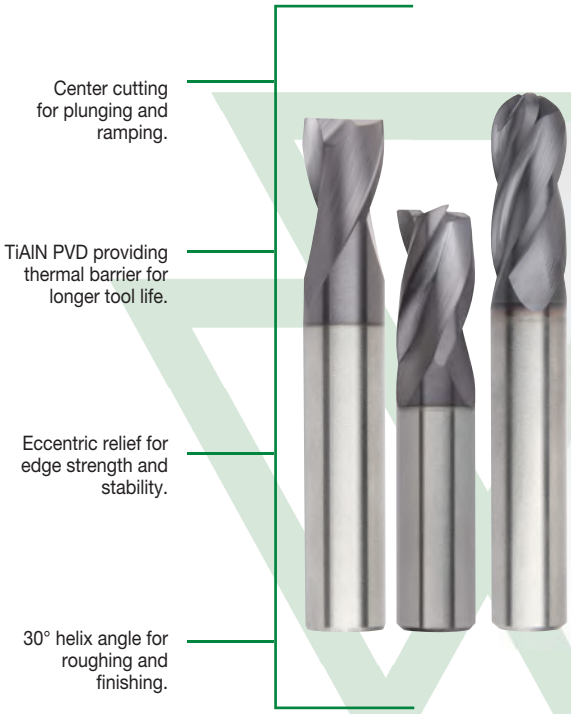
widia.com

WIDIA™

GP End Mills

General-Purpose Solid Carbide End Mills

The GP solid end milling line is a group of highly versatile end mills created for small shop customers to manage inventory effectively by reducing the initial tooling investment and increasing the value to recondition.



The GP end mills perform plunging, slotting, and profiling operations in a wide range of materials and applications. These versatile end mills were designed to provide high metal removal rates and excellent surface conditions at a value price. A wide range of diameters, lengths, and corner styles (such as chamfered, sharp edge, and ball nose) are available from stock.

VERSATILE

One design and grade to machine a wide range of materials.

RELIABLE

Mid-level performance and productivity in all machine conditions, including unstable setups.

VALUABLE

Low initial investment with simple regrind capability.

VALUABLE VERSATILITY

PRODUCT

GRADE

TiAlN, UNCOATED

FLUTES

2–4

DIAMETER RANGE

1–20mm

CORNER CONDITIONS

Sharp Edges
Chamfered
Radiused
Ball Nose

INDUSTRY

GENERAL ENGINEERING

MATERIALS

FIRST CHOICE

P M K N

APPLICATIONS

SIDE/ SHOULDER MILLING ROUGHING

SLOTTING SQUARE END

HELICAL MILLING

RAMPING BLANK

3D PROFILING

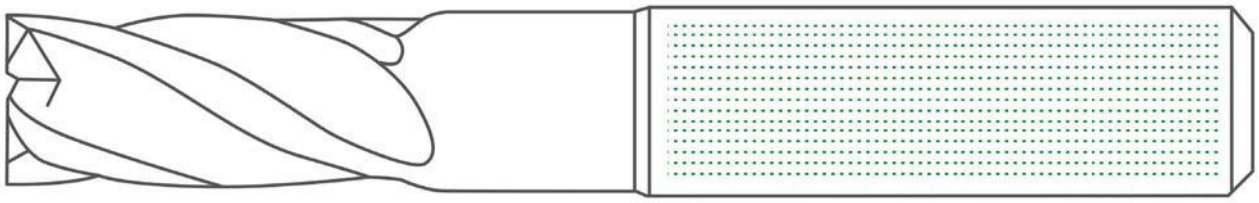
ECCENTRIC RELIEF

for edge strength and stability.

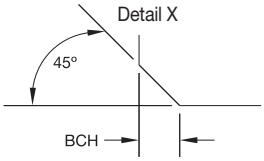
30° HELIX ANGLE

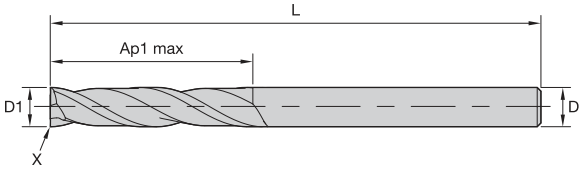
for high versatility.

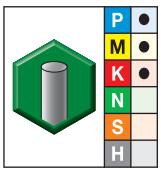
CYLINDRICAL AND WELDON® SHANK



GP End Mills • Series 4002 4012 • Square End • 2 Flute • Metric





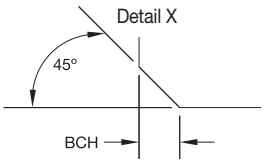


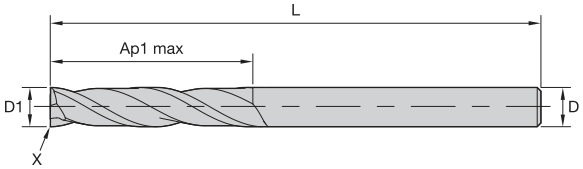
● first choice
○ alternate choice

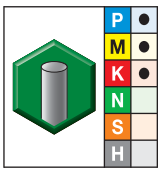
order #	catalogue # (TiAlN)	D1	D	length of cut Ap1 max	length L	BCH	Z U
5873484	40020100T004	1,0	3	4,00	38	–	2
5873485	40020150T004	1,5	3	4,00	38	–	2
5873486	40020180T004	1,8	3	4,00	38	–	2
5873487	40020200T006	2,0	3	6,30	38	–	2
5873488	40020250T006	2,5	3	6,30	38	–	2
5873489	40020300T009	3,0	3	9,50	38	–	2
5873490	40020300T019	3,0	3	19,00	63	–	2
5873491	40120300T025	3,0	3	25,00	75	–	2
5873492	40020350T012	3,5	4	12,00	54	–	2
5873493	40020400T012	4,0	4	12,00	50	0,10	2
6092621	40020400T012S	4,0	4	12,00	50	–	2
5873494	40020400T019	4,0	4	19,00	63	0,10	2
6092622	40020400T019S	4,0	4	19,00	63	–	2
6092623	40120400T031S	4,0	4	31,00	75	–	2
5873495	40120400T031	4,0	4	31,00	75	0,10	2
6092624	40020450T014S	4,5	6	14,00	50	–	2
5873496	40020450T014	4,5	6	14,00	50	0,10	2
5873498	40020500T014	5,0	5	14,00	50	0,10	2
6092627	40020500T014S	5,0	5	14,00	50	–	2
5873499	40020500T020	5,0	5	20,00	63	0,10	2
6092628	40020500T020S	5,0	5	20,00	63	–	2
6092631	40120500T031S	5,0	5	31,00	100	–	2
5873500	40120500T031	5,0	5	31,00	100	0,10	2
5873501	40020550T014	5,5	6	14,00	50	0,10	2
6092632	40020550T014S	5,5	6	14,00	50	–	2
6092633	40020600T016S	6,0	6	16,00	50	–	2
5873502	40020600T016	6,0	6	16,00	50	0,10	2
5873503	40020600T028	6,0	6	28,00	76	0,10	2
6092634	40020600T028S	6,0	6	28,00	76	–	2
6092636	40120600T038S	6,0	6	38,00	100	–	2
5873504	40120600T038	6,0	6	38,00	100	0,10	2
5873505	40020700T020	7,0	7	20,00	63	0,10	2
6092637	40020700T020S	7,0	7	20,00	63	–	2
5873506	40020800T020	8,0	8	20,00	63	0,20	2
6092638	40020800T020S	8,0	8	20,00	63	–	2
6092639	40020800T028S	8,0	8	28,00	76	–	2
5873507	40020800T028	8,0	8	28,00	76	0,20	2
6092640	40120800T041S	8,0	8	41,00	100	–	2
5873508	40120800T041	8,0	8	41,00	100	0,20	2
5873509	40020900T020	9,0	9	20,00	63	0,20	2
6092641	40020900T020S	9,0	9	20,00	63	–	2
5873510	40021000T022	10,0	10	22,00	72	0,20	2
6092643	40021000T022S	10,0	10	22,00	72	–	2
6092644	40021000T032S	10,0	10	32,00	89	–	2
5873511	40021000T032	10,0	10	32,00	89	0,20	2
6092645	40121000T045S	10,0	10	45,00	100	–	2
5873512	40121000T045	10,0	10	45,00	100	0,20	2
6092646	40021100T025S	11,0	11	25,00	76	–	2
5873513	40021100T025	11,0	11	25,00	76	0,30	2
5873514	40021200T025	12,0	12	25,00	76	0,30	2
6092647	40021200T025S	12,0	12	25,00	76	–	2
5873515	40021200T045	12,0	12	45,00	100	0,30	2
6092648	40021200T045S	12,0	12	45,00	100	–	2
6092650	40121200T075S	12,0	12	75,00	150	–	2
5873516	40121200T075	12,0	12	75,00	150	0,30	2
6092651	40021400T032S	14,0	14	32,00	83	–	2

GP End Mills • Series 4002 4012 • Square End • 2 Flute • Metric

(continued)





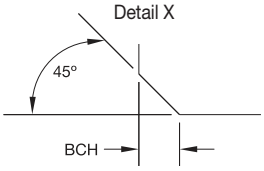


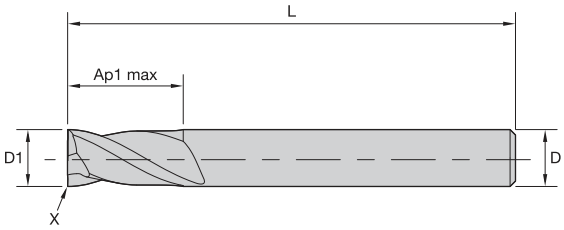
● first choice
○ alternate choice

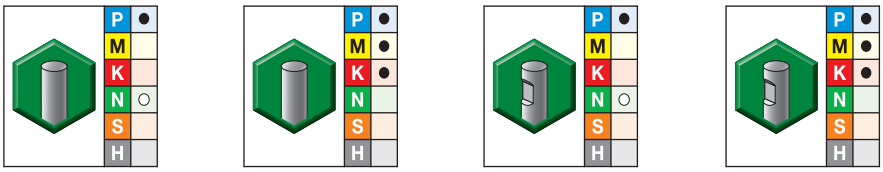
TiAlN order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
5873517	40021400T032	14,0	14	32,00	83	0,30	2
6092653	40021400T050S	14,0	14	50,00	100	—	2
5873518	40021400T050	14,0	14	50,00	100	0,30	2
6092654	40121400T075S	14,0	14	75,00	150	—	2
5873519	40121400T075	14,0	14	75,00	150	0,30	2
5873520	40021600T032	16,0	16	32,00	89	0,30	2
6092657	40021600T032S	16,0	16	32,00	89	—	2
6092658	40021600T056S	16,0	16	56,00	110	—	2
5873531	40021600T056	16,0	16	56,00	110	0,30	2
6092659	40121600T075S	16,0	16	75,00	150	—	2
5873532	40121600T075	16,0	16	75,00	150	0,30	2
5873533	40021800T038	18,0	18	38,00	100	0,30	2
6092660	40021800T038S	18,0	18	38,00	100	—	2
5873536	40022000T038	20,0	20	38,00	104	0,30	2
6092683	40022000T038S	20,0	20	38,00	104	—	2
5873537	40022000T056	20,0	20	56,00	125	0,30	2
6092684	40022000T056S	20,0	20	56,00	125	—	2
6092685	40122000T075S	20,0	20	75,00	150	—	2
5873538	40122000T075	20,0	20	75,00	150	0,30	2

NOTE: For application data, please see pages B47–B49.

GP End Mills • Series D002 D012 • Square End • 2 Flute • Metric





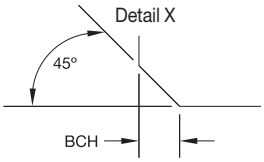


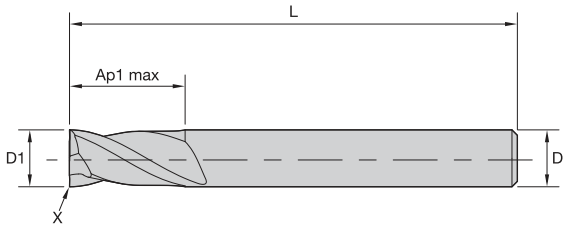
● first choice
○ alternate choice

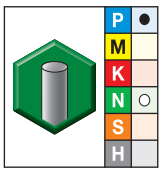
UNCOATED		TiAlN		UNCOATED		TiAlN							
order #	catalogue #	order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
5877567	D0020200T003	5877330	D0020200T003		–		–	2,0	6	3,00	50	–	2
	–	5877501	D0020250T003		–		–	2,5	6	3,00	50	–	2
5877569	D0120250T007	5877502	D0120250T007		–		–	2,5	6	7,00	57	–	2
5877571	D0020300T004	5877503	D0020300T004		–		–	3,0	6	4,00	50	–	2
5877572	D0120300T007	5877504	D0120300T007		–		–	3,0	6	7,00	57	–	2
5877573	D0020350T004	5877505	D0020350T004		–		–	3,5	6	4,00	50	–	2
	–	5877506	D0020400T005		–		–	4,0	6	5,00	54	0,10	2
	–	6092298	D0020400T005S		–		–	4,0	6	5,00	54	–	2
6092392	D0120400T008S	6092299	D0120400T008S		–		–	4,0	6	8,00	57	–	2
5877575	D0120400T008	5877507	D0120400T008		–		–	4,0	6	8,00	57	0,10	2
	–	6092300	D0020450T005S		–		–	4,5	6	5,00	54	–	2
	–	5877509	D0020450T005		–		–	4,5	6	5,00	54	0,10	2
	–	6092301	D0120450T008S		–		–	4,5	6	8,00	57	–	2
	–	5877510	D0120450T008		–		–	4,5	6	8,00	57	0,10	2
6092397	D0020500T006S	6092302	D0020500T006S		–		–	5,0	6	6,00	54	–	2
	–	5877511	D0020500T006		–		–	5,0	6	6,00	54	0,10	2
6092398	D0120500T010S	6092303	D0120500T010S		–		–	5,0	6	10,00	57	–	2
5877579	D0120500T010	5877512	D0120500T010		–		–	5,0	6	10,00	57	0,10	2
6092399	D0020600T007S	6092304	D0020600T007S		–		–	6,0	6	7,00	54	–	2
5877581	D0020600T007	5877513	D0020600T007		–		–	6,0	6	7,00	54	0,10	2
6092411	D0120600T010S	6092305	D0120600T010S		–		–	6,0	6	10,00	57	–	2
5877582	D0120600T010	5877514	D0120600T010		–		–	6,0	6	10,00	57	0,10	2
6092412	D0020700T008S	6092306	D0020700T008S		–		–	7,0	8	8,00	58	–	2
	–	5877515	D0020700T008		–		–	7,0	8	8,00	58	0,10	2
6092414	D0120700T013S	6092307	D0120700T013S		–		–	7,0	8	13,00	63	–	2
5877584	D0120700T013	5877516	D0120700T013		–		–	7,0	8	13,00	63	0,10	2
6092415	D0020800T009S	6092308	D0020800T009S		–		–	8,0	8	9,00	58	–	2
	–	5877517	D0020800T009		–		–	8,0	8	9,00	58	0,20	2
6092416	D0120800T016S	6092309	D0120800T016S		–		–	8,0	8	16,00	63	–	2
5877586	D0120800T016	5877518	D0120800T016		–		–	8,0	8	16,00	63	0,20	2
6092418	D0020900T010S	6092310	D0020900T010S		–		–	9,0	10	10,00	66	–	2
5877588	D0020900T010		–		–		–	9,0	10	10,00	66	0,20	2
	–	6092321	D0120900T016S		–		–	9,0	10	16,00	72	–	2
	–	5877521	D0120900T016		–		–	9,0	10	16,00	72	0,20	2
6092421	D0021000T011S	6092322	D0021000T011S		–		–	10,0	10	11,00	66	–	2
5877590	D0021000T011	5877522	D0021000T011		–		–	10,0	10	11,00	66	0,20	2
6092422	D0121000T019S	6092323	D0121000T019S		–		–	10,0	10	19,00	72	–	2
	–	5877523	D0121000T019		–		–	10,0	10	19,00	72	0,20	2
6092423	D0021200T012S	6092324	D0021200T012S		–	6092334	D0021200W012S	12,0	12	12,00	73	–	2
5877592	D0021200T012	5877524	D0021200T012		–	5877535	D0021200W012	12,0	12	12,00	73	0,30	2
6092424	D0121200T022S	6092325	D0121200T022S		–	6092335	D0121200W022S	12,0	12	22,00	83	–	2
	–	5877525	D0121200T022		–	5877537	D0121200W022	12,0	12	22,00	83	0,30	2
6092426	D0021400T014S	6092326	D0021400T014S		–	6092336	D0021400W014S	14,0	14	14,00	75	–	2
	–	5877526	D0021400T014		–	5877538	D0021400W014	14,0	14	14,00	75	0,30	2
	–	6092327	D0121400T022S		–	6092337	D0121400W022S	14,0	14	22,00	83	–	2
5877595	D0121400T022	5877527	D0121400T022		–	5877539	D0121400W022	14,0	14	22,00	83	0,30	2
	–	6092328	D0021600T016S		–	6092338	D0021600W016S	16,0	16	16,00	82	–	2
	–	5877529	D0021600T016		–	5877540	D0021600W016	16,0	16	16,00	82	0,30	2
	–	6092329	D0121600T026S	6092350	D0121600W026S	6092339	D0121600W026S	16,0	16	26,00	92	–	2
	–	5877530	D0121600T026		–	5877551	D0121600W026	16,0	16	26,00	92	0,30	2
	–	6092330	D0021800T018S		–	6092340	D0021800W018S	18,0	18	18,00	84	–	2
	–	5877531	D0021800T018		–	5877552	D0021800W018	18,0	18	18,00	84	0,30	2
	–	6092331	D0121800T026S		–	6092341	D0121800W026S	18,0	18	26,00	92	–	2
	–	5877532	D0121800T026		–	5877553	D0121800W026	18,0	18	26,00	92	0,30	2
	–	6092332	D0022000T020S		–	6092342	D0022000W020S	20,0	20	20,00	92	–	2
	–	5877533	D0022000T020		–	5877554	D0022000W020	20,0	20	20,00	92	0,30	2
	–	6092333	D0122000T032S		–	6092344	D0122000W032S	20,0	20	32,00	104	–	2
5877602	D0122000T032	5877534	D0122000T032		–	5877555	D0122000W032	20,0	20	32,00	104	0,30	2

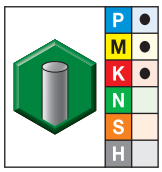
NOTE: For application data, please see page B47–B49.

GP End Mills • Series 2819 • Square End • 2 Flute • Metric DIN 6528







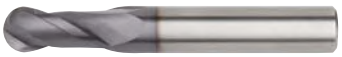


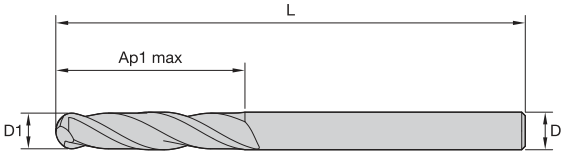
● first choice
○ alternate choice

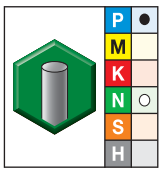
UNCOATED		TiAlN								
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z	U
	–	5877603	28190300T007	3,0	3	8,00	50	–	2	
6092573	28190400T008S	6092528	28190400T008S	4,0	4	8,00	50	–	2	
	–	5877604	28190400T008	4,0	4	8,00	50	0,10	2	
	–	6092529	28190500T010S	5,0	5	10,00	50	–	2	
	–	5877605	28190500T010	5,0	5	10,00	50	0,10	2	
	–	6092530	28190600T010S	6,0	6	10,00	57	–	2	
	–	5877606	28190600T010	6,0	6	10,00	57	0,10	2	
	–	6092562	28190800T016S	8,0	8	16,00	63	–	2	
	–	5877608	28190800T016	8,0	8	16,00	63	0,20	2	
	–	6092563	28190900T016S	9,0	9	16,00	67	–	2	
	–	5877609	28190900T016	9,0	9	16,00	67	0,20	2	
	–	6092565	28191000T019S	10,0	10	19,00	72	–	2	
	–	5877610	28191000T019	10,0	10	19,00	72	0,20	2	
	–	6092566	28191200T022S	12,0	12	22,00	83	–	2	
	–	5877611	28191200T022	12,0	12	22,00	83	0,30	2	
	–	6092567	28191400T022S	14,0	14	22,00	83	–	2	
	–	5877612	28191400T022	14,0	14	22,00	83	0,30	2	
	–	6092568	28191500T026S	15,0	15	26,00	92	–	2	
	–	5877613	28191500T026	15,0	15	26,00	92	0,30	2	
	–	6092569	28191600T026S	16,0	16	26,00	92	–	2	
	–	5877614	28191600T026	16,0	16	26,00	92	0,30	2	
	–	6092571	28192000T032S	20,0	20	32,00	104	–	2	
	–	5877616	28192000T032	20,0	20	32,00	104	0,30	2	

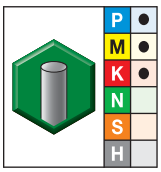
NOTE: For application data, please see pages B47.

GP End Mills • Series 4001 4011 4021 • Ball Nose • 2 Flute • Metric







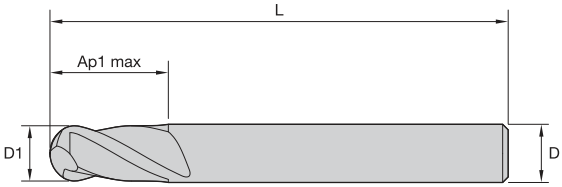


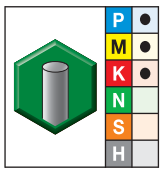
● first choice
○ alternate choice

UNCOATED order #	UNCOATED catalogue #	TiAlN order #	TiAlN catalogue #	D1	D	length of cut Ap1 max	length L	Z U
5880425	40010100T004	5880387	40010100T004	1,0	3	4,00	38	2
5880426	40010150T005	5880388	40010150T005	1,5	3	5,00	38	2
5880427	40010200T006	5880389	40010200T006	2,0	3	6,30	38	2
	–	5880390	40010250T007	2,5	3	7,00	38	2
5880429	40010300T009	5880391	40010300T009	3,0	3	9,50	38	2
	–	6232631	40110300T019	3,0	3	19,00	63	2
	–	6232632	40210300T025	3,0	3	25,00	75	2
	–	5880392	40010350T012	3,5	4	12,00	50	2
5880430	40010400T012	5880393	40010400T012	4,0	4	12,00	50	2
	–	5880395	40110400T019	4,0	4	19,00	63	2
5880432	40210400T031	5880396	40210400T031	4,0	4	31,00	75	2
5880433	40010500T014	6209446	40010500T014	5,0	5	14,00	50	2
	–	6209447	40110500T020	5,0	5	20,00	63	2
	–	5880397	40210500T014	5,0	6	14,00	50	2
5880435	40010600T020	5880398	40010600T020	6,0	6	20,00	63	2
5880436	40110600T028	5880399	40110600T028	6,0	6	28,00	76	2
5880437	40210600T038	5880400	40210600T038	6,0	6	38,00	100	2
5880438	40010800T020	5880401	40010800T020	8,0	8	20,00	63	2
5880439	40110800T028	5880402	40110800T028	8,0	8	28,00	76	2
5880440	40210800T040	5880403	40210800T040	8,0	8	40,00	100	2
5880441	40011000T022	5880404	40011000T022	10,0	10	22,00	76	2
5880442	40111000T032	5880405	40111000T032	10,0	10	32,00	89	2
5880443	40211000T045	5880406	40211000T045	10,0	10	45,00	100	2
5880444	40011200T025	5880407	40011200T025	12,0	12	25,00	75	2
5880445	40111200T045	5880408	40111200T045	12,0	12	45,00	100	2
5880446	40211200T075	5880409	40211200T075	12,0	12	75,00	150	2
	–	5880410	40011400T032	14,0	14	32,00	89	2
5880448	40011600T032	5880411	40011600T032	16,0	16	32,00	89	2
	–	6209448	40111600T056	16,0	16	56,00	110	2
	–	6209449	40211600T075	16,0	16	75,00	150	2
5880449	40012000T038	5880412	40012000T038	20,0	20	38,00	100	2
5880450	40112000T075	5880413	40112000T075	20,0	20	75,00	150	2

NOTE: For application data, please see pages B47–B49.

GP End Mills • Series D001 D011 • Ball Nose • 2 Flute • Metric



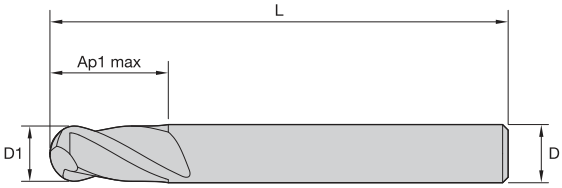


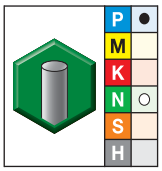
● first choice
○ alternate choice

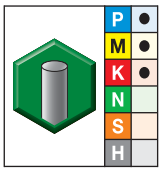
TiAlN						
order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
5880362	D0110200T006	2,0	6	6,00	57	2
5880363	D0010300T004	3,0	6	4,00	50	2
5880364	D0110300T007	3,0	6	7,00	57	2
5880365	D0010400T005	4,0	6	5,00	54	2
5880366	D0110400T008	4,0	6	8,00	57	2
5880367	D0110500T010	5,0	6	10,00	57	2
5880368	D0110600T010	6,0	6	10,00	57	2
5880369	D0110700T013	7,0	8	13,00	63	2
5880370	D0110800T016	8,0	8	16,00	63	2
5880381	D0111000T019	10,0	10	19,00	72	2
5880382	D0111200T022	12,0	12	22,00	83	2
5880383	D0111400T022	14,0	14	22,00	83	2
5880384	D0111600T026	16,0	16	26,00	92	2
5880385	D0012000T020	20,0	20	20,00	92	2
5880386	D0112000T032	20,0	20	32,00	104	2

NOTE: For application data, please see pages B48 and B50.

GP End Mills • Series 2838 • Ball Nose • 2 Flute • Metric





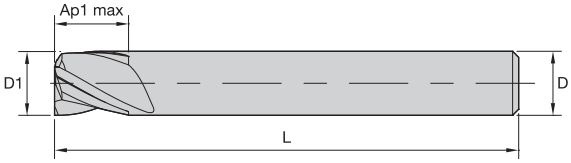


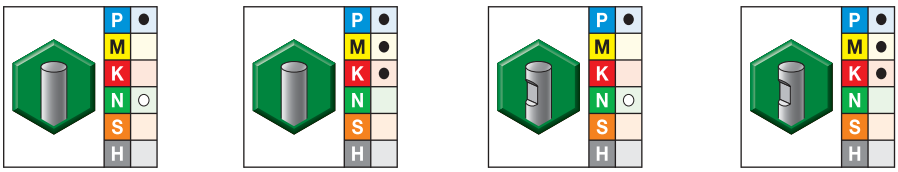
● first choice
○ alternate choice

UNCOATED		TiAlN						
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
	–	5880451	28380200T007	2,0	2	7,00	50	2
	–	5880452	28380300T007	3,0	3	7,00	50	2
	–	5880453	28380400T008	4,0	4	8,00	50	2
	–	5880454	28380500T010	5,0	5	10,00	50	2
5880465	28380600T010	5880455	28380600T010	6,0	6	10,00	57	2
	–	5880456	28380800T016	8,0	8	16,00	63	2
	–	5880457	28381000T019	10,0	10	19,00	72	2
	–	5880458	28381200T022	12,0	12	22,00	83	2
	–	5880459	28381400T022	14,0	14	22,00	83	2
	–	5880460	28381600T026	16,0	16	26,00	92	2

NOTE: For application data, please see page B50.

GP End Mills • Series 4003 4013 • Sharp Edge • 3 Flute • Metric



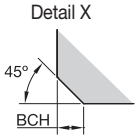


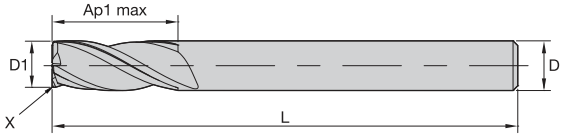
● first choice
○ alternate choice

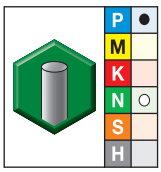
UNCOATED		TiAlN		UNCOATED		TiAlN						
order #	catalogue #	order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
6144570	40030100T004S	6144056	40030100T004S		–		–	1,0	3	4,00	38	3
6144651	40030150T004S	6144057	40030150T004S		–		–	1,5	3	4,00	38	3
6144652	40030200T006S	6144058	40030200T006S		–		–	2,0	3	6,30	38	3
6144653	40030250T006S	6144059	40030250T006S		–		–	2,5	3	6,30	38	3
6144654	40030300T009S	6144060	40030300T009S		–		–	3,0	3	9,50	38	3
6145303	40130300T019S	6145199	40130300T019S	6145319	40130300W019S	6145243	40130300W019S	3,0	6	19,00	63	3
6144655	40030400T012S	6144551	40030400T012S		–		–	4,0	4	12,00	50	3
6145305	40130400T019S	6145200	40130400T019S		–		–	4,0	4	19,00	63	3
6144656	40030500T014S	6144552	40030500T014S		–		–	5,0	6	14,00	50	3
	–	6145231	40130500T020S		–	6145247	40130500W020S	5,0	6	20,00	63	3
6144657	40030600T016S	6144553	40030600T016S		–	6144565	40030600W016S	6,0	6	16,00	50	3
6145309	40130600T028S	6145232	40130600T028S		–		–	6,0	6	28,00	75	3
6144658	40030800T019S	6144554	40030800T019S		–	6144566	40030800W019S	8,0	8	19,00	63	3
6145311	40130800T028S	6145233	40130800T028S		–		–	8,0	8	28,00	75	3
6144659	40031000T022S	6144555	40031000T022S		–	6144567	40031000W022S	10,0	10	22,00	76	3
6145313	40131000T032S	6145234	40131000T032S		–		–	10,0	10	32,00	89	3
6144660	40031200T025S	6144556	40031200T025S		–	6144568	40031200W025S	12,0	12	25,00	75	3
6145315	40131200T045S	6145235	40131200T045S		–	6145255	40131200W045S	12,0	12	45,00	100	3
6144661	40031600T032S	6144557	40031600T032S		–	6144569	40031600W032S	16,0	16	32,00	89	3
6145317	40131600T056S	6145238	40131600T056S		–	6145257	40131600W056S	16,0	16	56,00	110	3
6145318	40132000T064S	6145241	40132000T064S		–	6145259	40132000W064S	20,0	20	64,00	125	3

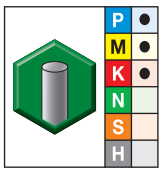
NOTE: For application data, please see pages B50–B52.

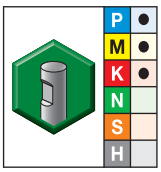
GP End Mills • Series 4003 4013 • Chamfered • 3 Flute • Metric









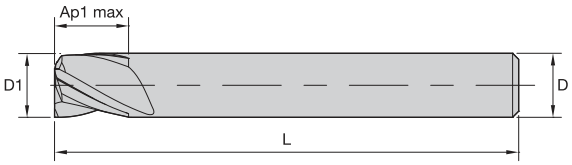


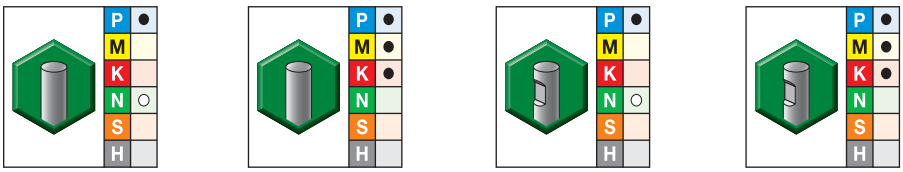
● first choice
○ alternate choice

UNCOATED		TiAlN		TiAlN							
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
	–	6145107	40030400T012		–	4,0	4	12,00	50	0,10	3
	–	6145181	40130400T019		–	4,0	4	19,00	63	0,10	3
6145275	40130500T020	6145182	40130500T020	6145190	40130500W020	5,0	6	20,00	63	0,10	3
6145242	40030600T016	6145109	40030600T016	6145176	40030600W016	6,0	6	16,00	50	0,10	3
6145276	40130600T028	6145183	40130600T028		–	6,0	6	28,00	75	0,10	3
	–	6145110	40030800T019		–	8,0	8	19,00	63	0,20	3
6145277	40130800T028	6145184	40130800T028		–	8,0	8	28,00	75	0,20	3
	–	6145171	40031000T022	6145178	40031000W022	10,0	10	22,00	76	0,20	3
6145278	40131000T032	6145185	40131000T032		–	10,0	10	32,00	89	0,20	3
6145248	40031200T025	6145172	40031200T025	6145179	40031200W025	12,0	12	25,00	75	0,30	3
6145279	40131200T045	6145186	40131200T045	6145194	40131200W045	12,0	12	45,00	100	0,30	3
6145250	40031600T032	6145173	40031600T032	6145180	40031600W032	16,0	16	32,00	89	0,30	3
	–	6145187	40131600T056	6145195	40131600W056	16,0	16	56,00	110	0,30	3
	–	6145188	40132000T064	6145196	40132000W064	20,0	20	64,00	125	0,30	3

NOTE: For application data, please see pages B50–B52.

GP End Mills • Series D003 D013 • Sharp Edge • 3 Flute • Metric



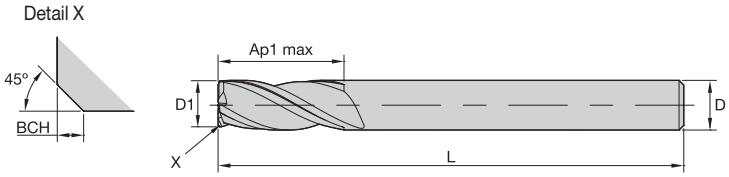


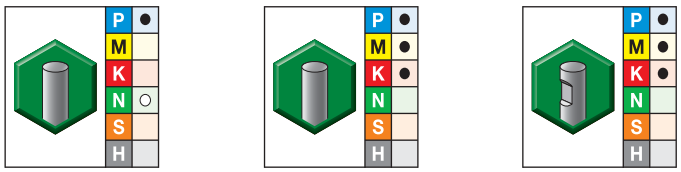
● first choice
○ alternate choice

UNCOATED		TiAlN		UNCOATED		TiAlN						
order #	catalogue #	order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
6144450	D0030200T003S	6144351	D0030200T003S		–	6144388	D0030200W003S	2,0	6	3,00	50	3
6143764	D0130200T006S	6144441	D0130200T006S	6143831	D0130200W006S	6144467	D0130200W006S	2,0	6	6,00	57	3
–		6144352	D0030250T003S		–	6144390	D0030250W003S	2,5	6	3,00	50	3
6143765	D0130250T007S	6144442	D0130250T007S	6143832	D0130250W007S	6144469	D0130250W007S	2,5	6	7,00	57	3
6144454	D0030300T004S	6144353	D0030300T004S	6144488	D0030300W004S	6144392	D0030300W004S	3,0	6	4,00	50	3
6143766	D0130300T007S	6144443	D0130300T007S	6143833	D0130300W007S	6144471	D0130300W007S	3,0	6	7,00	57	3
6144456	D0030350T004S	6144354	D0030350T004S		–	6144394	D0030350W004S	3,5	6	4,00	50	3
–		6144444	D0130350T007S	6143834	D0130350W007S	6144473	D0130350W007S	3,5	6	7,00	57	3
–		6144355	D0030400T005S	6144492	D0030400W005S	6144396	D0030400W005S	4,0	6	5,00	54	3
6143768	D0130400T008S	6144445	D0130400T008S	6143835	D0130400W008S	6144475	D0130400W008S	4,0	6	8,00	57	3
–		6144446	D0130450T008S	6143836	D0130450W008S	–		4,5	6	8,00	57	3
–		6144357	D0030500T006S		–	6144400	D0030500W006S	5,0	6	6,00	54	3
6143770	D0130500T010S	6144447	D0130500T010S	6143837	D0130500W010S	–		5,0	6	10,00	57	3
–		6144358	D0030550T007S		–	–		5,5	6	7,00	54	3
–		6144448	D0130550T010S		–	6144481	D0130550W010S	5,5	6	10,00	57	3
–		6144360	D0030600T007S		–	6144404	D0030600W007S	6,0	6	7,00	54	3
6143822	D0130600T010S	6144449	D0130600T010S	6143839	D0130600W010S	6144483	D0130600W010S	6,0	6	10,00	57	3
6144468	D0030700T008S	6144372	D0030700T008S		–	6144406	D0030700W008S	7,0	8	8,00	58	3
–		6144451	D0130700T013S		–	6144485	D0130700W013S	7,0	8	13,00	63	3
–		6144374	D0030800T009S		–	6144408	D0030800W009S	8,0	8	9,00	58	3
–		6144453	D0130800T016S		–	6144487	D0130800W016S	8,0	8	16,00	63	3
–		6144376	D0031000T011S		–	6144410	D0031000W011S	10,0	10	11,00	66	3
–		–		6143842	D0131000W019S	6144489	D0131000W019S	10,0	10	19,00	72	3
–		6144378	D0031200T012S		–	6144412	D0031200W012S	12,0	12	12,00	73	3
–		6144457	D0131200T022S		–	6144491	D0131200W022S	12,0	12	22,00	83	3
–		6144380	D0031400T014S		–	6144414	D0031400W014S	14,0	14	14,00	75	3
6143827	D0131400T022S	6144459	D0131400T022S		–	6144493	D0131400W022S	14,0	14	22,00	83	3
–		6144382	D0031600T016S		–	6144416	D0031600W016S	16,0	16	16,00	82	3
–		6144461	D0131600T026S		–	6144495	D0131600W026S	16,0	16	26,00	92	3
–		6144384	D0031800T018S		–	6144418	D0031800W018S	18,0	18	18,00	84	3
–		6144463	D0131800T026S		–	6144497	D0131800W026S	18,0	18	26,00	92	3
6144482	D0032000T020S	6144386	D0032000T020S		–	6144420	D0032000W020S	20,0	20	20,00	92	3
–		6144465	D0132000T032S		–	6144499	D0132000W032S	20,0	20	32,00	104	3

NOTE: For application data, please see pages B51–B52.

GP End Mills • Series D003 D013 • Chamfered • 3 Flute • Metric



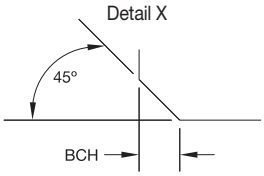


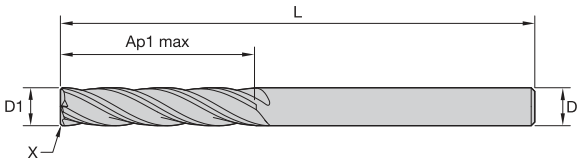
● first choice
○ alternate choice

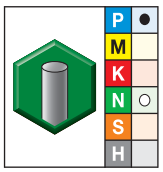
UNCOATED order #	UNCOATED catalogue #	TiAlN order #	TiAlN catalogue #	TiAlN order #	TiAlN catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
	–	6144295	D0030400T005	6144318	D0030400W005	4,0	6	5,00	54	0,10	3
	–	6144359	D0130400T008	6144395	D0130400W008	4,0	6	8,00	57	0,10	3
	–	6144296	D0030450T005	6144319	D0030450W005	4,5	6	5,00	54	0,10	3
	–	6144371	D0130450T008	6144397	D0130450W008	4,5	6	8,00	57	0,10	3
6145044	D0030500T006	6144297	D0030500T006	6144320	D0030500W006	5,0	6	6,00	54	0,10	3
	–	6144373	D0130500T010	6144399	D0130500W010	5,0	6	10,00	57	0,10	3
	–	6144298	D0030550T007	6144331	D0030550W007	5,5	6	7,00	54	0,10	3
	–	6144375	D0130550T010	6144401	D0130550W010	5,5	6	10,00	57	0,10	3
	–	6144299	D0030600T007	6144332	D0030600W007	6,0	6	7,00	54	0,10	3
	–	6144377	D0130600T010	6144403	D0130600W010	6,0	6	10,00	57	0,10	3
	–	6144300	D0030700T008	6144333	D0030700W008	7,0	8	8,00	58	0,10	3
	–	6144379	D0130700T013	6144405	D0130700W013	7,0	8	13,00	63	0,10	3
	–	6144311	D0030800T009	6144334	D0030800W009	8,0	8	9,00	58	0,20	3
6145087	D0130800T016	6144381	D0130800T016	6144407	D0130800W016	8,0	8	16,00	63	0,20	3
	–	6144312	D0031000T011	6144335	D0031000W011	10,0	10	11,00	66	0,20	3
	–	6144383	D0131000T019	6144409	D0131000W019	10,0	10	19,00	72	0,20	3
	–	6144313	D0031200T012	6144336	D0031200W012	12,0	12	12,00	73	0,30	3
	–	6144385	D0131200T022	6144411	D0131200W022	12,0	12	22,00	83	0,30	3
	–	6144314	D0031400T014	6144337	D0031400W014	14,0	14	14,00	75	0,30	3
	–	6144387	D0131400T022	6144413	D0131400W022	14,0	14	22,00	83	0,30	3
	–	6144315	D0031600T016	6144338	D0031600W016	16,0	16	16,00	82	0,30	3
	–	6144389	D0131600T026		–	16,0	16	26,00	92	0,30	3
	–	6144316	D0031800T018	6144339	D0031800W018	18,0	18	18,00	84	0,30	3
	–	6144391	D0131800T026	6144417	D0131800W026	18,0	18	26,00	92	0,30	3
	–	6144317	D0032000T020		–	20,0	20	20,00	92	0,30	3
	–	6144393	D0132000T032	6144419	D0132000W032	20,0	20	32,00	104	0,30	3

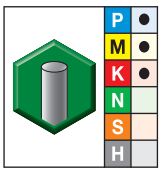
NOTE: For application data, please see pages B51–B52.

GP End Mills • Series 4004 4014 4024 • Square End • 4 Flute • Metric







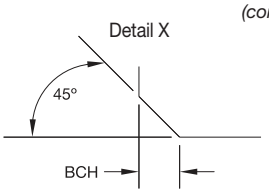


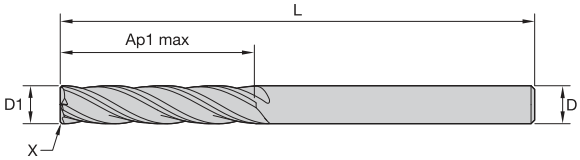
● first choice
○ alternate choice

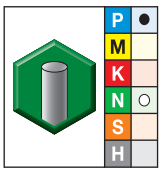
UNCOATED		TiAlN							
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
5826085	40040100T004	5826016	40040100T004	1,0	3	4,00	38	–	4
5826086	40040150T004	5826017	40040150T004	1,5	3	4,00	38	–	4
5826087	40040200T006	5826018	40040200T006	2,0	3	6,30	38	–	4
5826088	40040250T006	5826019	40040250T006	2,5	3	6,30	38	–	4
5826089	40040300T009	5826020	40040300T009	3,0	3	9,50	38	–	4
5826090	40140300T019	5826021	40140300T019	3,0	3	19,00	63	–	4
5826101	40240300T025	5826022	40240300T025	3,0	3	25,00	75	–	4
5826102	40040350T012	5826023	40040350T012	3,5	4	12,00	50	–	4
5826103	40040400T011	5826024	40040400T011	4,0	4	11,00	50	0,10	4
6085522	40040400T011S	6085576	40040400T011S	4,0	4	11,00	50	–	4
–		6085577	40140400T019S	4,0	4	19,00	63	–	4
–		5826025	40140400T019	4,0	4	19,00	63	0,10	4
–		6085578	40240400T031S	4,0	4	31,00	75	–	4
–		5826026	40240400T031	4,0	4	31,00	75	0,10	4
–		6085579	40040450T014S	4,5	5	14,00	50	–	4
5826104	40040450T014	5826027	40040450T014	4,5	5	14,00	50	0,10	4
–		6085580	40040500T013S	5,0	5	13,00	50	–	4
–		5826028	40040500T013	5,0	5	13,00	50	0,10	4
–		6085581	40040500T020S	5,0	5	20,00	63	–	4
5826105	40040500T020	5826029	40040500T020	5,0	5	20,00	63	0,10	4
–		6085582	40140500T030S	5,0	5	30,00	75	–	4
–		5826030	40140500T030	5,0	5	30,00	75	0,10	4
–		6085583	40240500T031S	5,0	5	31,00	100	–	4
–		5826031	40240500T031	5,0	5	31,00	100	0,10	4
6085525	40040600T016S	6085584	40040600T016S	6,0	6	16,00	50	–	4
5826106	40040600T016	5826032	40040600T016	6,0	6	16,00	50	0,10	4
6085526	40140600T028S	6085585	40140600T028S	6,0	6	28,00	75	–	4
5826107	40140600T028	5826033	40140600T028	6,0	6	28,00	75	0,10	4
6085527	40240600T038S	6085586	40240600T038S	6,0	6	38,00	100	–	4
5826108	40240600T038	5826034	40240600T038	6,0	6	38,00	100	0,10	4
–		6085587	40040700T020S	7,0	8	20,00	63	–	4
–		5826035	40040700T020	7,0	8	20,00	63	0,10	4
–		6200965	40040800T021S	8,0	8	20,00	63	–	4
6085528	40040800T020S	6085588	40040800T020S	8,0	8	20,00	50	–	4
5826109	40040800T020	5826036	40040800T020	8,0	8	20,00	50	0,20	4
6085529	40140800T028S	6085589	40140800T028S	8,0	8	28,00	75	–	4
5826110	40140800T028	5826037	40140800T028	8,0	8	28,00	75	0,20	4
6085530	40240800T041S	6085590	40240800T041S	8,0	8	41,00	100	–	4
5826111	40240800T041	5826038	40240800T041	8,0	8	41,00	100	0,20	4
–		6085591	40040900T020S	9,0	9	20,00	63	–	4
–		5826039	40040900T020	9,0	9	20,00	63	0,20	4
5826113	40041000T022	5826040	40041000T022	10,0	10	22,00	72	0,20	4
6085531	40041000T022S	6085592	40041000T022S	10,0	10	22,00	72	–	4
6085532	40141000T032S	6085593	40141000T032S	10,0	10	32,00	89	–	4
5826114	40141000T032	5826041	40141000T032	10,0	10	32,00	89	0,20	4
6085533	40241000T045S	6085594	40241000T045S	10,0	10	45,00	100	–	4
5826115	40241000T045	5826042	40241000T045	10,0	10	45,00	100	0,20	4
5826141	40041200W025		–	12,0	12	25,00	75	0,30	4
6085534	40041200T025S	6085610	40041200W025S	12,0	12	25,00	75	–	4
–		5826043	40041200T025	12,0	12	25,00	89	0,30	4
–		6085595	40041200T025S	12,0	12	25,00	89	–	4
5826116	40041200T025	5826070	40041200W025	12,0	12	25,00	75	0,30	4

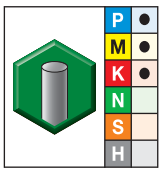
GP End Mills • Series 4004 4014 4024 • Square End • 4 Flute • Metric

(continued)







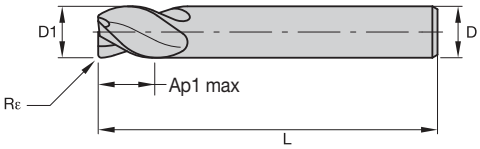


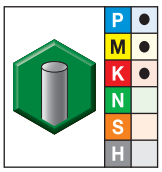
● first choice
○ alternate choice

UNCOATED order #	UNCOATED catalogue #	TiAlN order #	TiAlN catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
6085549	40041200W025S		–	12,0	12	25,00	75	–	4
6085535	40141200T045S	6085596	40141200T045S	12,0	12	45,00	100	–	4
5826117	40141200T045	5826044	40141200T045	12,0	12	45,00	100	0,30	4
–		6085611	40141200W045S	12,0	12	45,00	100	–	4
–		5826071	40141200W045	12,0	12	45,00	100	0,30	4
6085536	40241200T075S	6085597	40241200T075S	12,0	12	75,00	150	–	4
5826118	40241200T075	5826045	40241200T075	12,0	12	75,00	150	0,30	4
–		6085612	40241200W075S	12,0	12	75,00	150	–	4
–		5826072	40241200W075	12,0	12	75,00	150	0,30	4
–		6085613	40041400W032S	14,0	14	32,00	83	–	4
–		5826073	40041400W032	14,0	14	32,00	83	0,30	4
6085537	40041400T032S	6085598	40041400T032S	14,0	14	32,00	83	–	4
5826119	40041400T032	5826046	40041400T032	14,0	14	32,00	83	0,30	4
–		6085599	40141400T050S	14,0	14	50,00	100	–	4
–		5826047	40141400T050	14,0	14	50,00	100	0,30	4
–		6085614	40141400W050S	14,0	14	50,00	100	–	4
–		5826074	40141400W050	14,0	14	50,00	100	0,30	4
–		6085600	40241400T075S	14,0	14	75,00	150	–	4
–		5826049	40241400T075	14,0	14	75,00	150	0,30	4
–		6085615	40241400W075S	14,0	14	75,00	150	–	4
–		5826075	40241400W075	14,0	14	75,00	150	0,30	4
–		6085616	40041600W032S	16,0	16	32,00	92	–	4
–		5826076	40041600W032	16,0	16	32,00	92	0,30	4
6085540	40041600T032S	6085601	40041600T032S	16,0	16	32,00	92	–	4
5826122	40041600T032	5826061	40041600T032	16,0	16	32,00	92	0,30	4
5826123	40141600T056	5826062	40141600T056	16,0	16	56,00	110	0,30	4
–		6102465	40141600W056S	16,0	16	56,00	110	–	4
–		5826077	40141600W056	16,0	16	56,00	110	0,30	4
6085541	40141600T056S	6085602	40141600T056S	16,0	16	56,00	110	–	4
6085542	40241600T075S	6085603	40241600T075S	16,0	16	75,00	150	–	4
5826124	40241600T075	5826063	40241600T075	16,0	16	75,00	150	0,30	4
–		6085427	40241600W075S	16,0	16	75,00	150	–	4
–		5826078	40241600W075	16,0	16	75,00	150	0,30	4
6086533	40041800W038S	6085428	40041800W038S	18,0	18	38,00	100	–	4
6085543	40041800T038S	6085604	40041800T038S	18,0	18	38,00	100	–	4
5826125	40041800T038	5826064	40041800T038	18,0	18	38,00	100	0,30	4
–		6085605	40141800T060S	18,0	18	60,00	125	–	4
–		5826065	40141800T060	18,0	18	60,00	125	0,30	4
–		6085606	40241800T075S	18,0	18	75,00	150	–	4
–		5826066	40241800T075	18,0	18	75,00	150	0,30	4
6085546	40042000T038S	6085607	40042000T038S	20,0	20	38,00	104	–	4
–		5826082	40042000W038	20,0	20	38,00	104	0,30	4
5826128	40042000T038	5826067	40042000T038	20,0	20	38,00	104	0,30	4
–		6085511	40042000W038S	20,0	20	38,00	104	–	4
–		5826083	40142000W056	20,0	20	56,00	125	0,30	4
–		5826068	40142000T056	20,0	20	56,00	125	0,30	4
6085547	40142000T056S	6085608	40142000T056S	20,0	20	56,00	125	–	4
–		6085512	40142000W056S	20,0	20	56,00	125	–	4
6085548	40242000T075S	6085609	40242000T075S	20,0	20	75,00	150	–	4
–		5826069	40242000T075	20,0	20	75,00	150	0,30	4
–		6085513	40242000W075S	20,0	20	75,00	150	–	4
–		5826084	40242000W075	20,0	20	75,00	150	0,30	4

NOTE: For application data, please see pages B52–B54.

GP End Mills • Series 4004 4014 4024 • Radiused • 4 Flute • Metric



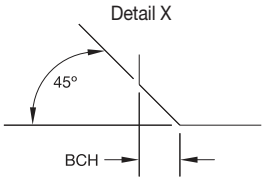


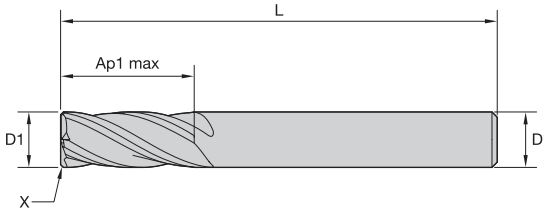
● first choice
○ alternate choice

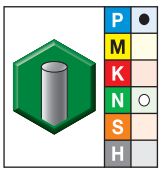
order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	Z U
	TiAlN						
6337590	40040200T006R050	2,0	3	6,30	38	0,50	4
6337731	40040300T009R050	3,0	3	9,50	38	0,50	4
6337732	40040300T009R100	3,0	3	9,50	38	1,00	4
6337892	40140300T019R050	3,0	3	19,00	63	0,50	4
6338335	40240300T025R050	3,0	3	25,00	75	0,50	4
6337733	40040400T011R050	4,0	4	11,00	50	0,50	4
6337734	40040400T011R100	4,0	4	11,00	50	1,00	4
6337893	40140400T019R050	4,0	4	19,00	63	0,50	4
6337894	40140400T019R100	4,0	4	19,00	63	1,00	4
6338336	40240400T031R050	4,0	4	31,00	75	0,50	4
6338337	40240400T031R100	4,0	4	31,00	75	1,00	4
6337735	40040500T013R050	5,0	5	13,00	50	0,50	4
6337895	40140500T030R050	5,0	5	30,00	75	0,50	4
6337896	40140500T030R100	5,0	5	30,00	75	1,00	4
6337737	40040600T016R100	6,0	6	16,00	50	1,00	4
6337736	40040600T016R050	6,0	6	16,00	50	0,50	4
6337897	40140600T028R050	6,0	6	28,00	75	0,50	4
6337898	40140600T028R100	6,0	6	28,00	75	1,00	4
6338338	40240600T038R050	6,0	6	38,00	100	0,50	4
6338339	40240600T038R100	6,0	6	38,00	100	1,00	4
6337739	40040800T020R100	8,0	8	20,00	50	1,00	4
6337738	40040800T020R050	8,0	8	20,00	50	0,50	4
6337899	40140800T028R050	8,0	8	28,00	75	0,50	4
6337900	40140800T028R100	8,0	8	28,00	75	1,00	4
6338340	40240800T041R050	8,0	8	41,00	100	0,50	4
6338341	40240800T041R100	8,0	8	41,00	100	1,00	4
6337740	40041000T022R050	10,0	10	22,00	72	0,50	4
6337741	40041000T022R100	10,0	10	22,00	72	1,00	4
6337912	40141000T032R100	10,0	10	32,00	89	1,00	4
6337911	40141000T032R050	10,0	10	32,00	89	0,50	4
6338342	40241000T045R050	10,0	10	45,00	100	0,50	4
6338343	40241000T045R100	10,0	10	45,00	100	1,00	4
6337742	40041200T025R050	12,0	12	25,00	89	0,50	4
6337743	40041200T025R100	12,0	12	25,00	89	1,00	4
6337914	40141200T045R100	12,0	12	45,00	100	1,00	4
6337913	40141200T045R050	12,0	12	45,00	100	0,50	4
6338344	40241200T075R050	12,0	12	75,00	150	0,50	4
6338345	40241200T075R100	12,0	12	75,00	150	1,00	4
6337744	40041600T032R050	16,0	16	32,00	92	0,50	4
6337745	40041600T032R100	16,0	16	32,00	92	1,00	4
6337915	40141600T056R050	16,0	16	56,00	110	0,50	4
6338346	40241600T075R050	16,0	16	75,00	150	0,50	4
6338347	40241600T075R100	16,0	16	75,00	150	1,00	4
6338349	40242000T075R050	20,0	20	75,00	150	0,50	4

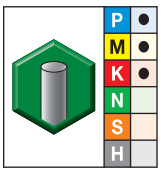
NOTE: Refer to the NOVO™ app for the complete GP end mill offering.

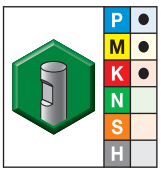
GP End Mills • Series D004 D014 • Square End • 4 Flute • Metric DIN 6527









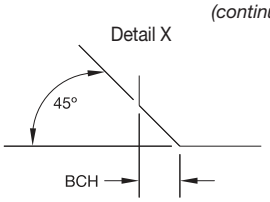


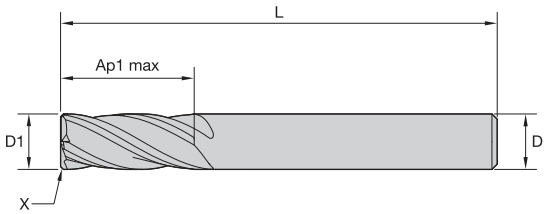
● first choice
○ alternate choice

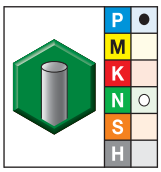
TiAlN		UNCOATED		TiAlN							
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
5825894	D0040200T004		–		–	2,0	6	4,00	50	–	4
5825895	D0140200T007		–		–	2,0	6	7,00	57	–	4
5825896	D0140250T008		–		–	2,5	6	8,00	57	–	4
5825897	D0040300T005		–		–	3,0	6	5,00	50	–	4
5825898	D0140300T008		–		–	3,0	6	8,00	57	–	4
5825899	D0140350T010		–		–	3,5	6	10,00	57	–	4
5825900	D0040400T008		–		–	4,0	6	8,00	54	0,10	4
6085348	D0040400T008S		–		–	4,0	6	8,00	54	–	4
6085349	D0140400T011S		–		–	4,0	6	11,00	57	–	4
5825931	D0140400T011		–		–	4,0	6	11,00	57	0,10	4
6085350	D0140450T011S		–		–	4,5	6	11,00	57	–	4
5825932	D0140450T011		–		–	4,5	6	11,00	57	0,10	4
6085361	D0040500T009S		–		–	5,0	6	9,00	54	–	4
5825933	D0040500T009		–		–	5,0	6	9,00	54	0,10	4
6085362	D0140500T013S		–		–	5,0	6	13,00	57	–	4
5825934	D0140500T013		–		–	5,0	6	13,00	57	0,10	4
6085363	D0140550T013S		–		–	5,5	6	13,00	57	–	4
5825935	D0140550T013		–		–	5,5	6	13,00	57	0,10	4
6085364	D0040600T010S		–		–	6,0	6	10,00	54	–	4
5825936	D0040600T010		–		–	6,0	6	10,00	54	0,10	4
6085365	D0140600T013S		–		–	6,0	6	13,00	57	–	4
5825937	D0140600T013		–		–	6,0	6	13,00	57	0,10	4
6085366	D0140650T016S		–		–	6,5	8	16,00	63	–	4
5825938	D0140650T016		–		–	6,5	8	16,00	63	0,10	4
6085367	D0040700T011S		–		–	7,0	8	11,00	58	–	4
5825939	D0040700T011		–		–	7,0	8	11,00	58	0,10	4
6085368	D0140700T016S		–		–	7,0	8	16,00	63	–	4
5825940	D0140700T016		–		–	7,0	8	16,00	63	0,10	4
6085369	D0140750T019S		–		–	7,5	8	19,00	63	–	4
5825941	D0140750T019		–		–	7,5	8	19,00	63	0,10	4
6085370	D0040800T012S		–		–	8,0	8	12,00	58	–	4
5825942	D0040800T012		–		–	8,0	8	12,00	58	0,20	4
6085371	D0140800T019S		–		–	8,0	8	19,00	63	–	4
5825943	D0140800T019		–		–	8,0	8	19,00	63	0,20	4
6085372	D0040900T013S		–		–	9,0	10	13,00	66	–	4
5825944	D0040900T013		–		–	9,0	10	13,00	66	0,20	4
6085373	D0140900T019S		–		–	9,0	10	19,00	72	–	4
5825945	D0140900T019		–		–	9,0	10	19,00	72	0,20	4
6085374	D0041000T014S		–		–	10,0	10	14,00	66	–	4
5825946	D0041000T014		–		–	10,0	10	14,00	66	0,20	4
6085375	D0141000T022S		–		–	10,0	10	22,00	72	–	4
5825947	D0141000T022		–		–	10,0	10	22,00	72	0,20	4
6085376	D0041200T016S	6085406	D0041200W016S	6085396	D0041200W016S	12,0	12	16,00	73	–	4
5825948	D0041200T016		–	5825958	D0041200W016	12,0	12	16,00	73	0,30	4
6085377	D0141200T026S		–	6085397	D0141200W026S	12,0	12	26,00	83	–	4
5825949	D0141200T026	5825969	D0141200W026	5825959	D0141200W026	12,0	12	26,00	83	0,30	4
	–		–	6085407	D0141200W026S	12,0	12	26,00	83	–	4
6085378	D0041400T018S		–		–	14,0	14	18,00	75	–	4
5825950	D0041400T018	5825970	D0041400W018	5825960	D0041400W018	14,0	14	18,00	75	0,30	4
6085379	D0141400T026S		–	6085399	D0141400W026S	14,0	14	26,00	83	–	4
5825951	D0141400T026		–	5825961	D0141400W026	14,0	14	26,00	83	0,30	4
	–		–	6085409	D0141400W026S	14,0	14	26,00	83	–	4

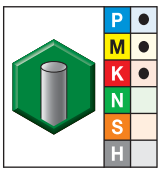
GP End Mills • Series D004 D014 • Square End • 4 Flute • Metric DIN 6527

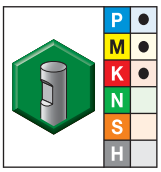
(continued)









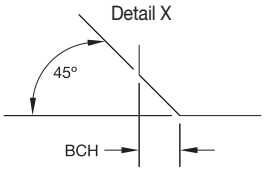


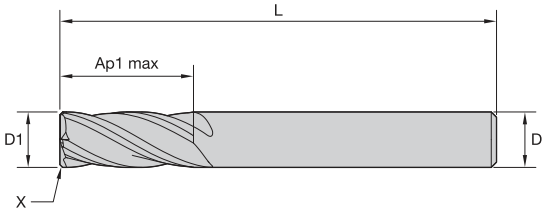
● first choice
○ alternate choice

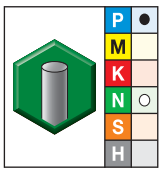
TiAlN		UNCOATED		TiAlN							
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
6085380	D0041600T022S	6085410	D0041600W022S	6085400	D0041600W022S	16,0	16	22,00	82	–	4
5825952	D0041600T022	5825972	D0041600W022	5825962	D0041600W022	16,0	16	22,00	82	0,30	4
6085391	D0141600T032S	6085421	D0141600W032S	6085401	D0141600W032S	16,0	16	32,00	92	–	4
5825953	D0141600T032	5825973	D0141600W032	5825963	D0141600W032	16,0	16	32,00	92	0,30	4
6085392	D0041800T024S	6086478	D0041800W024S	6085402	D0041800W024S	18,0	18	24,00	84	–	4
5825954	D0041800T024		–	5825964	D0041800W024	18,0	18	24,00	84	0,30	4
6085393	D0141800T032S		–	6085403	D0141800W032S	18,0	18	32,00	92	–	4
5825955	D0141800T032		–	5825965	D0141800W032	18,0	18	32,00	92	0,30	4
6085394	D0042000T026S		–	6085404	D0042000W026S	20,0	20	26,00	92	–	4
5825956	D0042000T026	5825976	D0042000W026	5825966	D0042000W026	20,0	20	26,00	92	0,30	4
6085395	D0142000T038S	6086491	D0142000W038S	6085405	D0142000W038S	20,0	20	38,00	104	–	4
5825957	D0142000T038	5825977	D0142000W038	5825967	D0142000W038	20,0	20	38,00	104	0,30	4

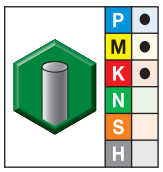
NOTE: For application data, please see pages B52–B54.

GP End Mills • Series 2528 • Square End • 4 Flute • Metric DIN 6528







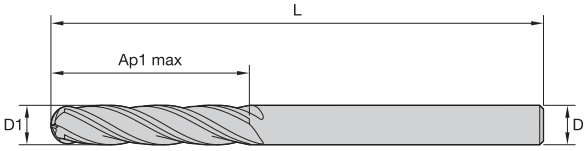


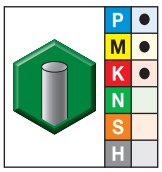
● first choice
○ alternate choice

UNCOATED		TiAlN								
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
	–	6086492	25280400T011S	4,0	4	11,00	50	–	4
	–	5825978	25280400T011	4,0	4	11,00	50	0,10	4
	–	6086493	25280500T013S	5,0	5	13,00	50	–	4
	–	5825979	25280500T013	5,0	5	13,00	50	0,10	4
6086509	25280600T013S	6086494	25280600T013S	6,0	6	13,00	57	–	4
	–	5825980	25280600T013	6,0	6	13,00	57	0,10	4
	–	6086495	25280800T019S	8,0	8	19,00	63	–	4
	–	5825981	25280800T019	8,0	8	19,00	63	0,20	4
	–	6086496	25281000T022S	10,0	10	22,00	72	–	4
	–	5825982	25281000T022	10,0	10	22,00	72	0,20	4
	–	6086497	25281200T026S	12,0	12	26,00	83	–	4
	–	5825983	25281200T026	12,0	12	26,00	83	0,30	4
	–	6086498	25281400T026S	14,0	14	26,00	83	–	4
	–	5825984	25281400T026	14,0	14	26,00	83	0,30	4
	–	6086499	25281600T032S	16,0	16	32,00	92	–	4
	–	5825985	25281600T032	16,0	16	32,00	92	0,30	4
	–	6086500	25281800T032S	18,0	18	32,00	92	–	4
	–	5825986	25281800T032	18,0	18	32,00	92	0,30	4
	–	6086501	25282000T038S	20,0	20	38,00	104	–	4
	–	5825987	25282000T038	20,0	20	38,00	104	0,30	4

NOTE: For application data, please see pages B52–B54.

GP End Mills • Series 4000 4010 • Ball Nose • 4 Flute • Metric



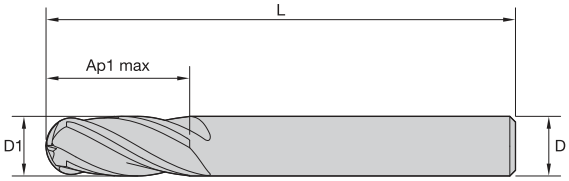


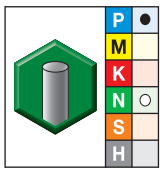
● first choice
○ alternate choice

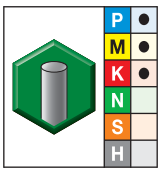
TiAlN order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
5825555	40000200T006	2,0	3	6,30	38	4
6231685	40000300T009	3,0	3	9,50	38	4
6232637	40100300T019	3,0	3	19,00	63	4
5825556	40000300T020	3,0	3	20,00	75	4
5825557	40000400T014	4,0	4	14,00	50	4
5825558	40100400T025	4,0	4	25,00	75	4
5825559	40000500T016	5,0	5	16,00	50	4
5825560	40100500T030	5,0	5	30,00	75	4
5825573	40000600T016	6,0	6	16,00	50	4
5825574	40100600T019	6,0	6	19,00	63	4
5825575	40100600T030	6,0	6	30,00	75	4
5825576	40000800T019	8,0	8	19,00	63	4
6232638	40100800T028	8,0	8	28,00	76	4
5825577	40100800T040	8,0	8	40,00	100	4
5825578	40001000T022	10,0	10	22,00	72	4
6232639	40101000T032	10,0	10	32,00	89	4
5825579	40101000T040	10,0	10	40,00	100	4
5825580	40001200T025	12,0	12	25,00	75	4
5825581	40101200T045	12,0	12	45,00	150	4
6232640	40101200T046	12,0	12	46,00	100	4
6232671	40101200T075	12,0	12	75,00	150	4
5825583	40001400T032	14,0	14	32,00	83	4
5825584	40101400T050	14,0	14	50,00	100	4
5825585	40001600T032	16,0	16	32,00	89	4
5825586	40101600T065	16,0	16	65,00	150	4
5825588	40102000T056	20,0	20	56,00	125	4
6232672	40102000T075	20,0	20	75,00	150	4

NOTE: For application data, please see pages B53–B54.

GP End Mills • Series D010 • Ball Nose • 4 Flute • Metric DIN 6527





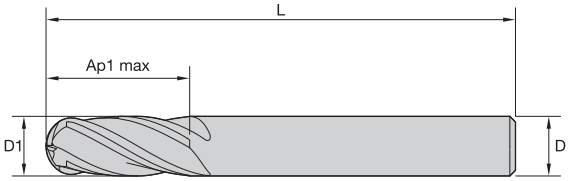


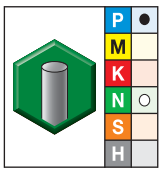
● first choice
○ alternate choice

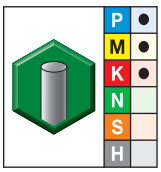
UNCOATED order #	UNCOATED catalogue #	TiAlN order #	TiAlN catalogue #	D1	D	length of cut Ap1 max	length L	Z U
5825604	D0100300T008	5825527	D0100300T008	3,0	6	8,00	57	4
5825605	D0100400T011	5825528	D0100400T011	4,0	6	11,00	57	4
—		5825529	D0100500T013	5,0	6	13,00	57	4
5825607	D0100600T013	5825530	D0100600T013	6,0	6	13,00	57	4
5825608	D0100800T019	5825531	D0100800T019	8,0	8	19,00	63	4
5825609	D0101000T022	5825532	D0101000T022	10,0	10	22,00	72	4
5825610	D0101200T026	5825533	D0101200T026	12,0	12	26,00	83	4
5825589	D0101200W026	5825540	D0101200W026	12,0	12	26,00	83	4
5825611	D0101400T026	5825534	D0101400T026	14,0	14	26,00	83	4
5825590	D0101400W026	5825541	D0101400W026	14,0	14	26,00	83	4
5825612	D0101600T032	5825536	D0101600T032	16,0	16	32,00	92	4
—		5825542	D0101600W032	16,0	16	32,00	92	4
5825613	D0101800T032	5825538	D0101800T032	18,0	18	32,00	92	4
—		5825543	D0101800W032	18,0	18	32,00	92	4
5825614	D0102000T038	5825539	D0102000T038	20,0	20	38,00	104	4
5825593	D0102000W038	5825544	D0102000W038	20,0	20	38,00	104	4

NOTE: For application data, please see page B53.

GP End Mills • Series 2848 • Ball Nose • 4 Flute • Metric DIN 6528







● first choice
○ alternate choice

UNCOATED		TiAlN						
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
	–	5825545	28480400T011	4,0	4	11,00	50	4
	–	5825546	28480500T013	5,0	5	13,00	50	4
	–	5825547	28480600T013	6,0	6	13,00	57	4
5825597	28480800T019	5825548	28480800T019	8,0	8	19,00	63	4
	–	5825549	28481000T022	10,0	10	22,00	72	4
	–	5825550	28481200T026	12,0	12	26,00	83	4
	–	5825551	28481400T026	14,0	14	26,00	83	4
	–	5825552	28481600T032	16,0	16	32,00	92	4
	–	5825553	28481800T032	18,0	18	32,00	92	4
	–	5825554	28482000T038	20,0	20	38,00	104	4

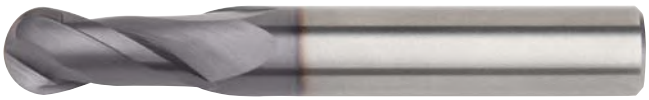
NOTE: For application data, please see pages B53.

GP End Mills • Series D002 4002 • Application Data • Uncoated • Metric

Material Group		Side Milling (A) and Slotting (B)			Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B	Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	ap	min		max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	0,1 x D	0,1 x D	0,5 x D	120	–	160	fz	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	1	0,1 x D	0,1 x D	0,5 x D	120	–	160	fz	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	2	0,1 x D	0,1 x D	0,5 x D	112	–	152	fz	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	0,5 x D	400	–	1600	fz	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N	2	Ap1 max	0,1 x D	0,5 x D	400	–	1200	fz	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N	4	Ap1 max	0,1 x D	0,5 x D	320	–	600	fz	0,014	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series 4011 4021 • Application Data • Uncoated • Metric



Material Group		Side Milling (A)		Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	min		max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	1	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	2	Ap1 max	0,1 x D	112	–	152	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	400	–	1600	fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N	2	Ap1 max	0,1 x D	400	–	1200	fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N	4	Ap1 max	0,1 x D	320	–	600	fz	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

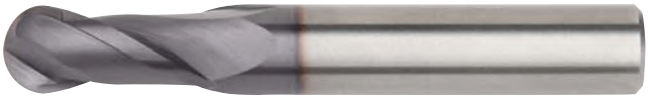
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.
For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D012 2819 4012 4022 • Application Data • Uncoated • Metric

Material Group		Side Milling (A)		Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	min		max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	1	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	2	Ap1 max	0,1 x D	112	–	152	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	400	–	1600	fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N	2	Ap1 max	0,1 x D	400	–	1200	fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N	4	Ap1 max	0,1 x D	320	–	600	fz	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D001 4001 • Application Data • Uncoated • Metric



Material Group		Side Milling (A) and Slotting (B)			Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	1	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	Ap1 max	0,1 x D	0,5 x D	112	–	152	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	0,5 x D	400	–	1600	fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
	2	Ap1 max	0,1 x D	0,5 x D	400	–	1200	fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
	4	Ap1 max	0,1 x D	0,5 x D	320	–	600	fz	0,007	0,014	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

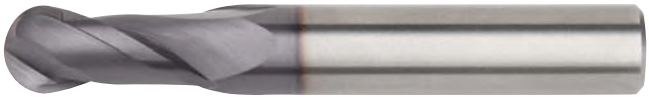
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.
For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D002 4002 • Application Data • TiAlN • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series 4011 4021 • Application Data • TiAlN • Metric



Material Group		Side Milling (A)		TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A).												
		A		Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	min		max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

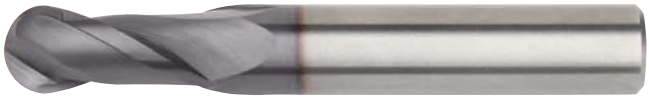
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.
For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D012 4012 • Application Data • TiAlN • Metric

Material Group		Side Milling (A)		TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A).												
		A		Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	min		max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D001 D011 2838 4001 • Application Data • TiAlN • Metric



Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.													
		A		B	Cutting Speed — vc m/min				D1 — Diameter												
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

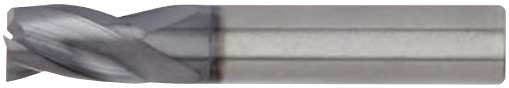
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.
For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series 4013..S 4013 • Application Data • Uncoated • Metric

Material Group		Side Milling (A)		Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	min		max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	1	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	Ap1 max	0,1 x D	112	–	152	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	400	–	1600	fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
	2	Ap1 max	0,1 x D	400	–	1200	fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
	4	Ap1 max	0,1 x D	320	–	600	fz	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

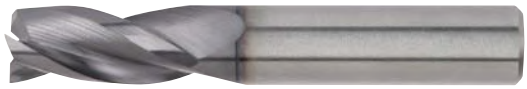
GP End Mills • Series D003..S D013..S D003 D013 4003..S 4003 • Application Data • Uncoated • Metric



Material Group		Side Milling (A)		Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	min		max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	1	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	Ap1 max	0,1 x D	112	–	152	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	400	–	1600	fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
	2	Ap1 max	0,1 x D	400	–	1200	fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
	4	Ap1 max	0,1 x D	320	–	600	fz	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

GP End Mills • Series 4013..S 4013 • Application Data • TiAlN • Metric



Material Group		Side Milling (A)		TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A).												
		A		Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

GP End Mills • Series D003..S D013..S D003 D013 4003..S 4003 • Application Data • TiAlN • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.													
		A		B	Cutting Speed — vc m/min				D1 — Diameter												
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

GP End Mills • Series 4004 4014 4024 • Application Data • Uncoated • Metric

Material Group		Side Milling (A) and Slotting (B)			Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.										
		A		B	Cutting Speed — vc m/min				D1 — Diameter									
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	1	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	Ap1 max	0,1 x D	0,5 x D	112	–	152	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	0,5 x D	400	–	1600	fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
	2	Ap1 max	0,1 x D	0,5 x D	400	–	1200	fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
	4	Ap1 max	0,1 x D	0,5 x D	320	–	600	fz	0,007	0,014	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D014 2528 4014 4024 • Application Data • Uncoated • Metric

Material Group		Side Milling (A)		Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A).							
		A		Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	min		max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	1	Ap1 max	0,1 x D	120	–	160	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	Ap1 max	0,1 x D	112	–	152	fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	400	–	1600	fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
	2	Ap1 max	0,1 x D	400	–	1200	fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
	4	Ap1 max	0,1 x D	320	–	600	fz	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series D010 2848 4010 • Application Data • Uncoated • Metric

Material Group		Side Milling (A) and Slotting (B)			Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.										
		A		B	Cutting Speed — vc m/min				D1 — Diameter									
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	1	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P	2	Ap1 max	0,1 x D	0,5 x D	112	–	152	fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
N	1	Ap1 max	0,1 x D	0,5 x D	400	–	1600	fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N	2	Ap1 max	0,1 x D	0,5 x D	400	–	1200	fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N	4	Ap1 max	0,1 x D	0,5 x D	320	–	600	fz	0,007	0,014	0,021	0,028	0,042	0,056	0,070	0,084	0,112	0,140

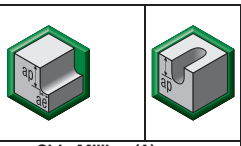
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

GP End Mills • Series 4004 4014 4024 • Application Data • TiAlN • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — Vc m/min				D1 — Diameter											
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
P	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
M	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
K	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on greater than 12mm diameters.

GP End Mills • Series 4000 4010 • Application Data • TiAlN • Metric



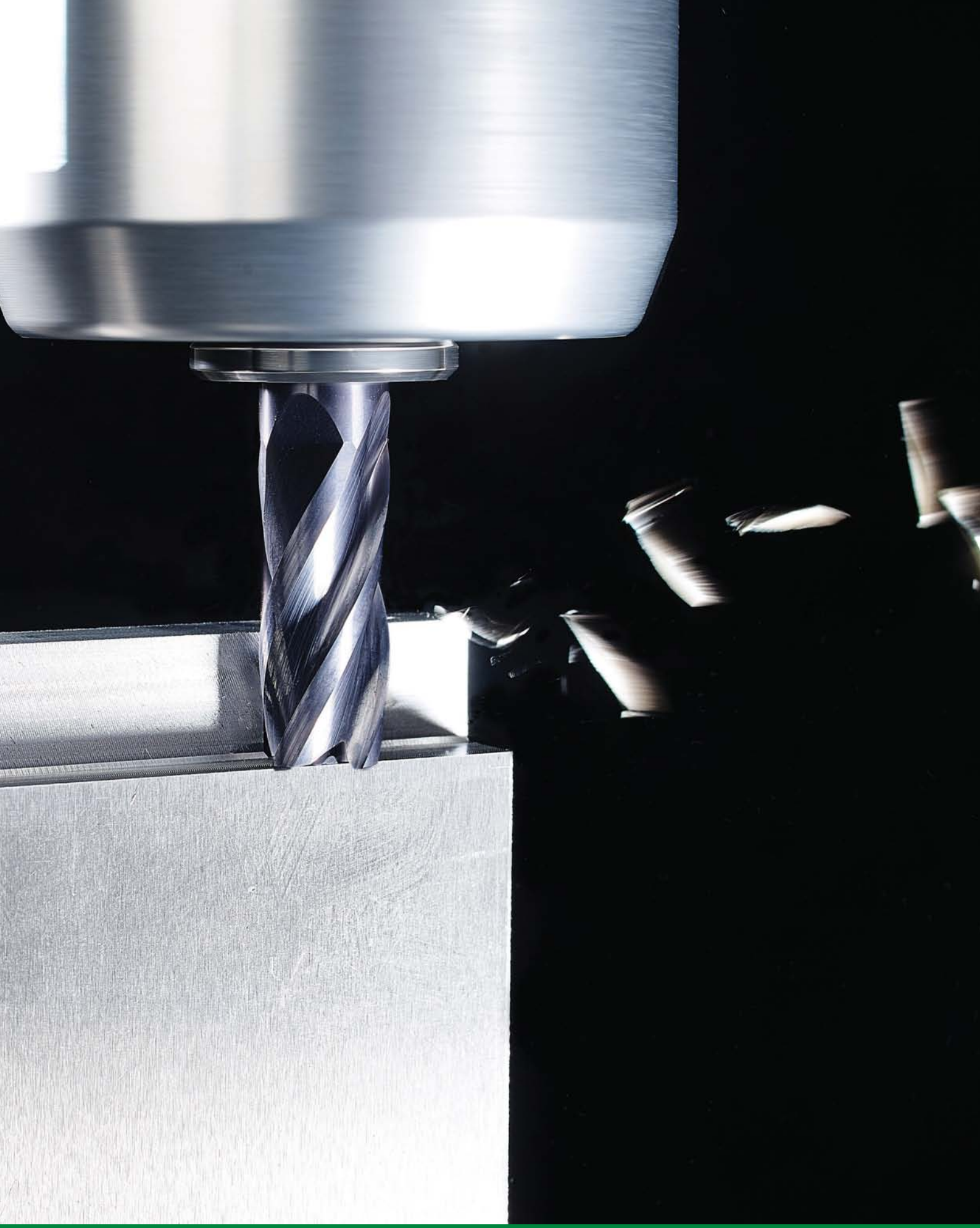
Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.
Refer to NOVO for slotting application information.

GP End Mills • Series D014 2528 4014 4024 • Application Data • TiAlN • Metric

Material Group		Side Milling (A)		TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A).												
		A		Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	min		max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.



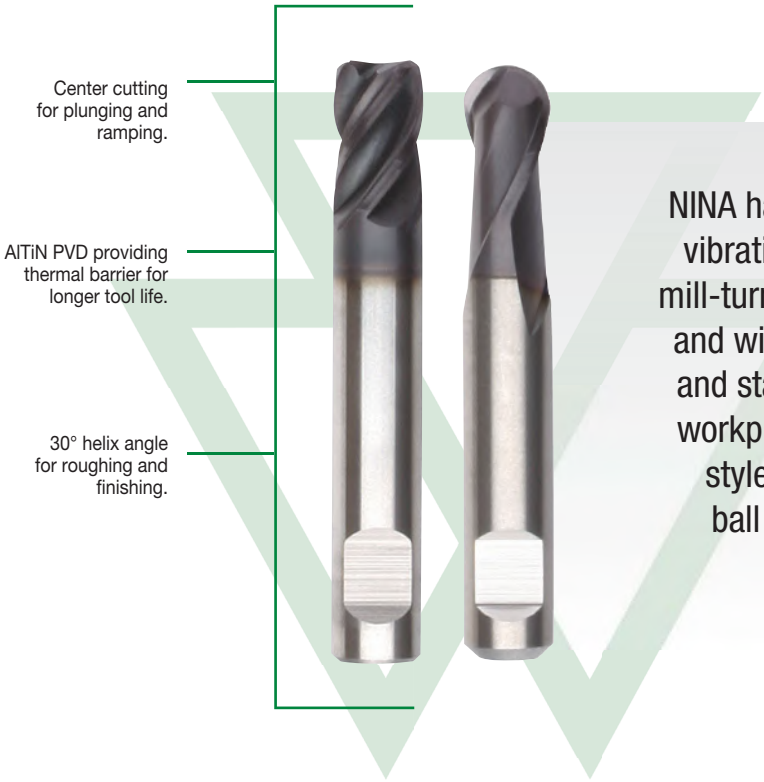
widia.com

WIDIA™

NINA™

General-Purpose Solid Carbide End Mills

NINA end mills are designed to minimize tool costs for short length-of-cut applications. This end mill is an economical choice for high-quality and performance when regrinding is not justified.



NINA has a short, compact design to minimize vibration and enhance soft cutting action on mill-turn machines. A state-of-the-art substrate and wide range of coatings offer high tool life and stable manufacturing on a wide range of workpiece materials. With different front-end styles (sharp edge, corner chamfer, radii, ball nose, and chamfering), NINA covers a wide range of applications.

SHORT

The NINA series is designed to perform a maximum depth of cut of 1 x D.

STABLE

The overall design of the NINA cutters is shorter vs regular end mills, providing more stability under high radial force conditions.

ECONOMIC

With the shorter design less carbide is used to make the tool a more economical option.

SHORT, AFFORDABLE STABILITY

PRODUCT

GRADE

TiAlN, ALTIN, K30F-DCHP

FLUTES

2–4

DIAMETER RANGE

2–12mm

CORNER CONDITIONS

Sharp Edges
Chamfer
Ball Nose

INDUSTRY

GENERAL ENGINEERING

MATERIALS

FIRST CHOICE

P M K

APPLICATIONS

SIDE/ SHOULDER MILLING ROUGHING

SLOTTING SQUARE END

HELICAL MILLING

RAMPING BLANK

3D PROFILING

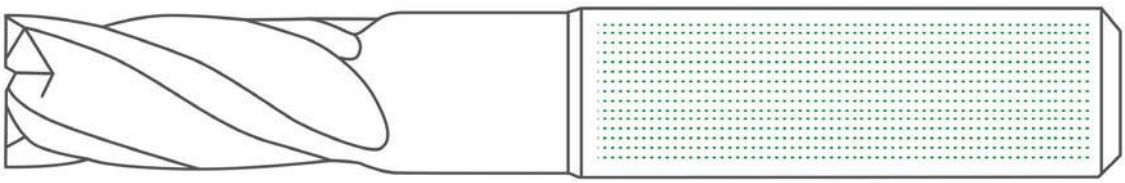
CENTER CUTTING

for maximum flexibility.

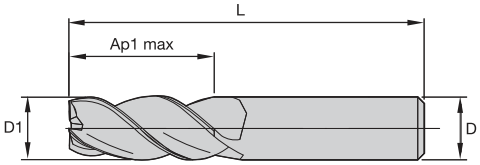
30° HELIX ANGLE

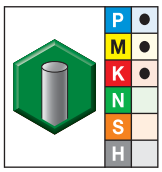
for high versatility.

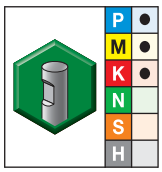
CYLINDRICAL AND WELDON® SHANK

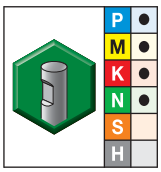


NINA • Series 423002 423001 323001







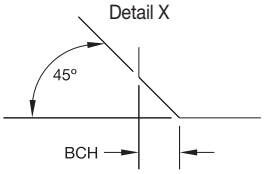


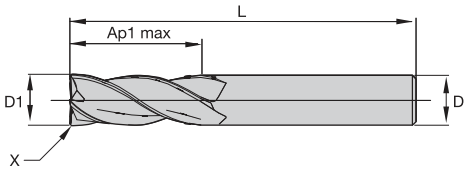
● first choice
○ alternate choice

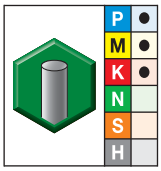
TiAlN		TiAlN		TiCN-CW						
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
2627990	423002-000020	2343352	423001-000020	2336740	323001-000020	2,0	6	4,00	38	3
2628043	423002-000030	2343354	423001-000030	2336747	323001-000030	3,0	6	5,00	38	3
2628044	423002-000040	2343356	423001-000040	2336753	323001-000040	4,0	6	7,00	38	3
2628045	423002-000050	2343358	423001-000050	2336759	323001-000050	5,0	6	8,00	38	3
2628046	423002-000060	2343360	423001-000060	2336765	323001-000060	6,0	6	8,00	38	3
2628047	423002-000080	2343362	423001-000080	2336771	323001-000080	8,0	8	11,00	43	3
2628048	423002-000100	2343364	423001-000100	2336777	323001-000100	10,0	10	13,00	50	3
2628049	423002-000120	2343366	423001-000120	2336783	323001-000120	12,0	12	15,00	55	3

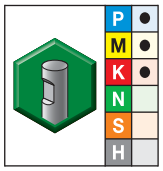
NOTE: For application data, please see page B61.

NINA • Series 423004 423003







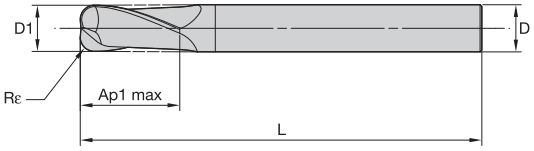


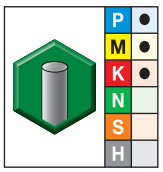
● first choice
○ alternate choice

AlTiN-MT		AlTiN-MW							
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	Z U
3657761	423004-000040		–	4,0	6	7,00	38	0,40	4
3657762	423004-000060	3657757	423003-000060	6,0	6	8,00	38	0,40	4
3657763	423004-000080	3657758	423003-000080	8,0	8	11,00	43	0,40	4
3657764	423004-000100	3657759	423003-000100	10,0	10	13,00	50	0,50	4
3657765	423004-000120	3657760	423003-000120	12,0	12	15,00	55	0,50	4

NOTE: For application data, please see page B61.

NINA • Series 423048



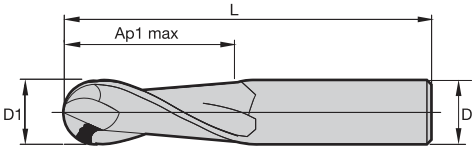


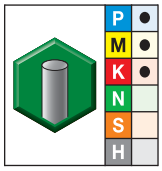
● first choice
○ alternate choice

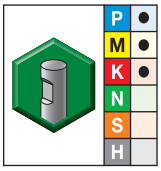
AlTiN-MT							
order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	Z U
2343566	423048-000030	3,0	6	5,00	38	0,50	2
2343568	423048-000040	4,0	6	7,00	38	0,50	2

NOTE: For application data, please see page B62.

NINA • Series 423039 423038





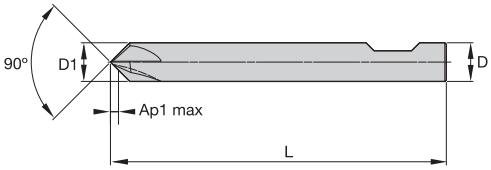


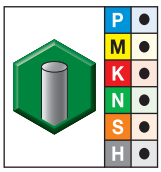
● first choice
○ alternate choice

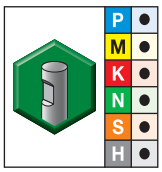
AlTiN-MT		AlTiN-MW						
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
	–	2343514	423038-000020	2,0	6	4,00	38	2
2343533	423039-000030	2343516	423038-000030	3,0	6	5,00	38	2
	–	2343519	423038-000040	4,0	6	7,00	38	2
	–	2343521	423038-000050	5,0	6	8,00	38	2
2343539	423039-000060	2343523	423038-000060	6,0	6	8,00	38	2
	–	2343525	423038-000080	8,0	8	11,00	43	2
	–	2343527	423038-000100	10,0	10	13,00	50	2
	–	2343529	423038-000120	12,0	12	15,00	55	2

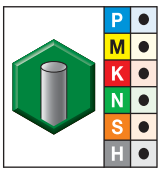
NOTE: For application data, please see page B62.

NINA • Series 423036 423037









● first choice
○ alternate choice

TiAlN		TiAlN		AlTiN						
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
	–	2343508	423036-000060		–	6,0	6	1,00	38	4
2628498	423037-000060		–		–	6,0	6	1,00	83	4
	–	2343510	423036-000080		–	8,0	8	1,50	43	4
2628499	423037-000080		–		–	8,0	8	1,50	104	4
	–	2343512	423036-000100		–	10,0	10	2,00	50	4
	–		–	2628500	423037-000100	10,0	10	2,00	125	4

NOTE: For application data, please see page B63.

NINA • Series 423002 323002 423001 323001 • Application Data • K30F-DCF • Metric

Material Group		Side Milling (A) and Slotting (B)			K30F-TICN TiCN			K30F-DCF TiAIN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.								
		A		B	Cutting Speed — vc m/min			Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	ap	min	–	max	min	–	max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	0	0,75 x D	0,5 x D	0,5 x D	150	–	200	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
	1	0,75 x D	0,5 x D	0,5 x D	150	–	200	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
	2	0,75 x D	0,5 x D	0,5 x D	140	–	190	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
	3	0,75 x D	0,5 x D	0,5 x D	120	–	160	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070
	4	0,75 x D	0,5 x D	0,5 x D	90	–	150	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062
M	1	0,75 x D	0,5 x D	0,5 x D	90	–	115	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070
	2	0,75 x D	0,5 x D	0,5 x D	60	–	80	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056
K	1	0,75 x D	0,5 x D	0,5 x D	120	–	150	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
	2	0,75 x D	0,5 x D	0,5 x D	110	–	140	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070
N	1	0,75 x D	0,5 x D	0,5 x D	500	–	2000	500	–	2000	fz	0,020	0,030	0,040	0,050	0,060	0,080	0,100	0,120
	2	0,75 x D	0,5 x D	0,5 x D	500	–	1500	500	–	1500	fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108
	5	0,75 x D	0,5 x D	0,5 x D	250	–	1000	250	–	1000	fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108

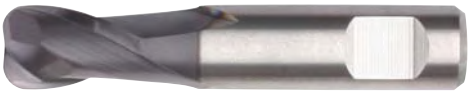
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

NINA • Series 423004 423003 • Application Data • K30F-DCHP • Metric

Material Group		Side Milling (A) and Slotting (B)			K30F-DCHP AlTiN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.						
		A		B	Cutting Speed — vc m/min				D1 — Diameter					
		ap	ae	ap	min	–	max	mm	4,0	5,0	6,0	8,0	10,0	12,0
P	0	1 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083
	1	1 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083
	2	1 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083
	3	1 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070
	4	1 x D	0,5 x D	1 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062
M	1	1 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070
	2	1 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056
K	1	1 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083
	2	1 x D	0,5 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070
	3	1 x D	0,5 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056
N	1	1 x D	0,5 x D	1 x D	500	–	2000	fz	0,040	0,050	0,060	0,080	0,100	0,120
	2	1 x D	0,5 x D	1 x D	500	–	1500	fz	0,036	0,045	0,054	0,072	0,090	0,108
	3	1 x D	0,5 x D	1 x D	250	–	1000	fz	0,036	0,045	0,054	0,072	0,090	0,108

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

NINA • Series 423048 423047 • Application Data • K30F-DCHP • Metric



Material Group		Side Milling (A) and Slotting (B)			K30F-DCHP AlTiN Cutting Speed — vc m/min			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.						
		A		B					D1 — Diameter					
		ap	ae	ap	min	–	max	mm	4,0	5,0	6,0	8,0	10,0	12,0
P	0	0,75 x D	0,5 x D	0,5 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083
	1	0,75 x D	0,5 x D	0,5 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083
	2	0,75 x D	0,5 x D	0,5 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083
	3	0,75 x D	0,5 x D	0,5 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070
	4	0,75 x D	0,5 x D	0,5 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062
M	1	0,75 x D	0,5 x D	0,5 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070
	2	0,75 x D	0,5 x D	0,5 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056
K	1	0,75 x D	0,5 x D	0,5 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083
	2	0,75 x D	0,5 x D	0,5 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070
N	1	0,75 x D	0,5 x D	0,5 x D	500	–	2000	fz	0,040	0,050	0,060	0,080	0,100	0,120
	2	0,75 x D	0,5 x D	0,5 x D	500	–	1500	fz	0,036	0,045	0,054	0,072	0,090	0,108
	5	0,75 x D	0,5 x D	0,5 x D	250	–	1000	fz	0,036	0,045	0,054	0,072	0,090	0,108

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

NINA • Series 423039 423038 • Application Data • K30F-DCHP • Metric

Material Group		Side Milling (A) and Slotting (B)			K30F-DCHP AlTiN Cutting Speed — vc m/min			Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A)						
		A		B					D1 — Diameter					
		ap	ae	ap	min	–	max	mm	4,0	5,0	6,0	8,0	10,0	12,0
P	0	0,75 x D	0,5 x D	0,5 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083
	1	0,75 x D	0,5 x D	0,5 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083
	2	0,75 x D	0,5 x D	0,5 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083
	3	0,75 x D	0,5 x D	0,5 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070
	4	0,75 x D	0,5 x D	0,5 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062
M	1	0,75 x D	0,5 x D	0,5 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070
	2	0,75 x D	0,5 x D	0,5 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056
K	1	0,75 x D	0,5 x D	0,5 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083
	2	0,75 x D	0,5 x D	0,5 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070
N	1	0,75 x D	0,5 x D	0,5 x D	500	–	2000	fz	0,040	0,050	0,060	0,080	0,100	0,120
	2	0,75 x D	0,5 x D	0,5 x D	500	–	1500	fz	0,036	0,045	0,054	0,072	0,090	0,108
	5	0,75 x D	0,5 x D	0,5 x D	250	–	1000	fz	0,036	0,045	0,054	0,072	0,090	0,108

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

NINA • Series 423036 423037 • Application Data • K30F-DCHP • Metric

Material Group		Chamfer Milling		K30F-DCF TiAlN			K30F-DCHP AlTiN			Recommended feed per tooth (fz = mm/th) for chamfering (A)			
		A		Cutting Speed — vc m/min			Cutting Speed — vc m/min				D1 — Diameter		
		ap	ae	min	–	max	min	–	max	mm	6,0	8,0	10,0
P	0	0,35 x D	0,35 x D	150	–	200	150	–	200	fz	0,035	0,048	0,058
	1	0,35 x D	0,35 x D	150	–	200	150	–	200	fz	0,035	0,048	0,058
	2	0,35 x D	0,35 x D	140	–	190	140	–	190	fz	0,035	0,048	0,058
	3	0,35 x D	0,35 x D	120	–	160	120	–	160	fz	0,029	0,040	0,048
	4	0,35 x D	0,35 x D	90	–	150	90	–	150	fz	0,026	0,036	0,043
	5	0,35 x D	0,35 x D	60	–	100	60	–	100	fz	0,024	0,032	0,039
	6	0,35 x D	0,35 x D	50	–	75	50	–	75	fz	0,020	0,027	0,032
M	1	0,35 x D	0,35 x D	90	–	115	90	–	115	fz	0,029	0,040	0,048
	2	0,35 x D	0,35 x D	60	–	80	60	–	80	fz	0,024	0,032	0,039
	3	0,35 x D	0,35 x D	60	–	70	60	–	70	fz	0,020	0,027	0,032
K	1	0,35 x D	0,35 x D	120	–	150	120	–	150	fz	0,035	0,048	0,058
	2	0,35 x D	0,35 x D	110	–	140	110	–	140	fz	0,029	0,040	0,048
	3	0,35 x D	0,35 x D	110	–	130	110	–	130	fz	0,024	0,032	0,039
N	1	0,35 x D	0,35 x D	500	–	2000	500	–	2000	fz	0,048	0,064	0,080
	2	0,35 x D	0,35 x D	500	–	1500	500	–	1500	fz	0,043	0,058	0,072
	3	0,35 x D	0,35 x D	500	–	1500	500	–	1500	fz	0,034	0,045	0,056
	4	0,35 x D	0,35 x D	400	–	750	400	–	750	fz	0,0038	0,051	0,064
	5	0,35 x D	0,35 x D	250	–	1000	250	–	1000	fz	0,043	0,058	0,072
	6	0,35 x D	0,35 x D	100	–	750	100	–	750	fz	0,048	0,064	0,080
	7	0,35 x D	0,35 x D	100	–	750	100	–	750	fz	0,034	0,045	0,056
S	1	0,35 x D	0,35 x D	50	–	90	50	–	90	fz	0,036	0,050	0,061
	2	0,35 x D	0,35 x D	25	–	40	25	–	40	fz	0,019	0,026	0,032
	3	0,35 x D	0,35 x D	25	–	40	25	–	40	fz	0,019	0,026	0,032
	4	0,35 x D	0,35 x D	50	–	60	50	–	60	fz	0,026	0,037	0,045
H	1	0,35 x D	0,35 x D	80	–	140	80	–	140	fz	0,026	0,036	0,043

HANITA™

PRODUCTIVITY

Solid end mills in the Hanita™ portfolio achieve exceptional levels of productivity in complex operations at increased cutting parameters.

DURABILITY

End mills in the Hanita portfolio feature optimized geometries capable of peak performance in high-demand machining strategies.

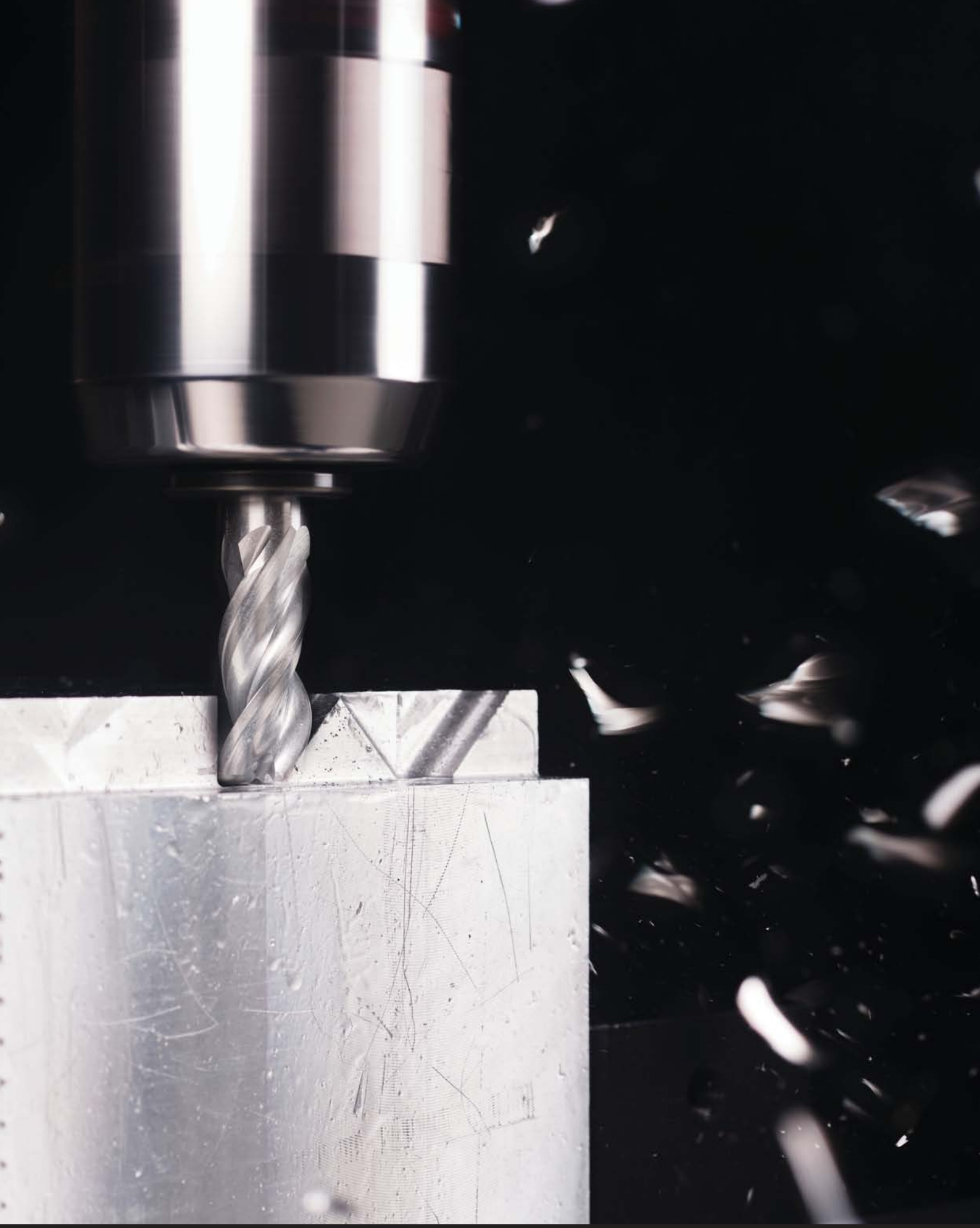
INNOVATION

Hanita is a brand for innovation enthusiasts who are searching for precision-engineered solid carbide end mill solutions.

Hanita **high-performance solid carbide end mill solutions** are developed for customers who have a passion for performance.

Offering a comprehensive range of standard and custom end mills spanning a broad range of diameters and lengths, all boasting **unparalleled metal removal rates** through **innovative geometries,** Hanita delivers not only the tool for the job but **the experience** to develop a solution for the customer.

Hanita solutions are available through WIDIA™ channel partners.



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HANITA™

Solid End Milling

Hanita High-Performance Solid Carbide End Mills B68–B199

VariMill XTREME B84–B92

VariMill I B94–B104

VariMill II B106–B118

VariMill III ER B120–B124

Roughers B126–B138

Finishers B140–B149

ALUFLASH B150–B160

X-Feed B162–B167

Vision Plus B168–B192

HSS End Mills B194–B199

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill™ XTREME™	VariMill XTREME	VariMill XTREME	VariMill XTREME	VariMill XTREME	VariMill XTREME	VariMill XTREME
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**4X0E**	**4X0E**	**4X0E**	**4XNE**	**4XNE**	**4XNE**	**4XNE**
Page		B86	B86	B87	B87	B88	B88	B89
Flute		4	4	4	4	4	4	4
Diameter D1		3—25mm	4—12mm	25mm	4—20mm	16mm	4—20mm	16mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	0,10—0,30mm	—	—	0,30mm	0,10—0,30mm	—
Radius Sizes		0,20—3,00mm	—	1,00mm	—	—	—	0,20—5,00mm
Helix Angle		37° / 39°	37° / 39°	37° / 39°	37° / 39°	37° / 39°	37° / 39°	37° / 39°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	No	No	Yes	Yes	Yes	Yes
Materials								
P	**0**	●	●	●	●	●	●	●
	1	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
K	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	○	○	○	○	○	○	○
	2	○	○	○	○	○	○	○
	3	○	○	○	○	○	○	○
	4	○	○	○	○	○	○	○
H	**1**	○	○	○	○	○	○	○
	2	○	○	○	○	○	○	○
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill™ XTREME™	VariMill I™	VariMill I	VariMill I	VariMill I	VariMill I	VariMill I
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**4XNE**	**4777**	**4777**	**4777**	**4777**	**4717**	**4727**
Page		B89	B96	B96	B96	B96	B97	B97
Flute		4	4	4	4	4	4	4
Diameter D1		12—20mm	4—20mm	4—25mm	4—25mm	4—25mm	6—20mm	12—20mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	Long	Extended
Corner Style								
Chamfer Size		—	—	0,40—0,50mm	—	0,40—0,50mm	0,40—0,50mm	0,50mm
Radius Sizes		1,00mm	—	—	0,20—5,00mm	—	—	—
Helix Angle		37° / 39°	38°	38°	38°	38°	38°	38°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		Yes	No	No	No	No	No	No
Materials								
P	**0**	●	●	●	●	●	●	●
	1	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	**1**	●	○	○	○	○	○	○
	2	●	○	○	○	○	○	○
	3	●	○	○	○	○	○	○
K	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	○	○	○	○	○	○	○
	2	○	○	○	○	○	○	○
	3	○	○	○	○	○	○	○
	4	○	○	○	○	○	○	○
H	**1**	○	○	○	○	○	○	○
	2	○	○	○	○	○	○	○
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

		Hanita Solid End Milling Portfolio						
		VariMill I™	VariMill I	VariMill I	VariMill I	VariMill I	VariMill II™	VariMill II
● first choice ○ alternate choice								
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**4778**	**47N7**	**47N7**	**47N6**	**47N0**	**5777**	**5777**
Page		B98	B99	B99	B100	B100	B108	B108
Flute		4	4	4	4	4	5	5
Diameter D1		4—25mm	4—20mm	6—20mm	6—20mm	5—20mm	4—20mm	4—25mm
Shank								
Length of Cut		Regular	Regular	Regular	Extended	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	0,40—0,50mm	0,40—0,50mm	—	—	—
Radius Sizes		0,20—0,30mm	0,40—5,00mm	—	—	—	—	0,25—5,00mm
Helix Angle		38°	38°	38°	38°	38°	38°	38°
Center Cutting		Yes	Yes	Yes	Yes	Yes	No	No
Neck		No	Yes	Yes	Yes	Yes	No	No
Materials								
P	**0**	○	●	●	●	●	●	●
	1	○	●	●	●	●	●	●
	2	○	●	●	●	●	●	●
	3	○	●	●	●	●	●	●
	4	○	●	●	●	●	●	●
	5	○	●	●	●	●	●	●
	6	○	●	●	●	●	●	●
M	**1**	●	○	○	○	○	○	○
	2	●	○	○	○	○	○	○
	3	●	○	○	○	○	○	○
K	**1**		●	●	●	●	●	●
	2		●	●	●	●	●	●
	3		●	●	●	●	●	●
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	●	○	○	○	○	○	○
	2	●	○	○	○	○	○	○
	3	●	○	○	○	○	○	○
	4	●	○	○	○	○	○	○
H	**1**		○	○	○	○	○	○
	2		○	○	○	○	○	○
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill II™	VariMill II	VariMill II	VariMill II	VariMill II	VariMill II	VariMill II
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**5777**	**577C**	**577C**	**577C**	**57N8**	**57N8**	**57N8**
Page		B108	B109	B109	B109	B110	B110	B110
Flute		5	5	5	5	5	5	5
Diameter D1		16,00mm	4—20mm	4—25mm	4—25mm	6—16mm	6—25mm	16—20mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		0,75mm	—	0,25—5,00mm	0,25—0,75mm	—	0,5—5,00mm	0,5—3,00mm
Helix Angle		38°	38°	38°	38°	38°	38°	38°
Center Cutting		No	Yes	Yes	Yes	No	No	No
Neck		No	No	No	No	Yes	Yes	Yes
Materials								
P	**0**	●	●	●	●	○	○	○
	1	●	●	●	●	○	○	○
	2	●	●	●	●	○	○	○
	3	●	●	●	●	○	○	○
	4	●	●	●	●	○	○	○
	5	●	●	●	●	○	○	○
	6	●	●	●	●	○	○	○
M	**1**	○	○	○	○	●	●	●
	2	○	○	○	○	●	●	●
	3	○	○	○	○	●	●	●
K	**1**	●	●	●	●			
	2	●	●	●	●			
	3	●	●	●	●			
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	○	○	○	○	●	●	●
	2	○	○	○	○	●	●	●
	3	○	○	○	○	●	●	●
	4	○	○	○	○	●	●	●
H	**1**	○	○	○	○			
	2	○	○	○	○			
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill II™	VariMill II	VariMill II	VariMill II	VariMill II	VariMill II	VariMill II
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**57NC**	**57NC**	**57NC**	**577E**	**577E**	**577E**	**577E**
Page		B111	B111	B111	B112	B112	B112	B112
Flute		5	5	5	5	5	5	5
Diameter D1		6—25mm	6—25mm	6—25mm	10mm	12—20mm	16—20mm	16—25mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		—	0,25—4,00mm	0,50—3,00mm	—	0,75mm	—	0,75mm
Helix Angle		38°	38°	38°	38°	38°	38°	38°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		Yes	Yes	Yes	No	No	No	No
Materials								
P	**0**	○	○	○				
	1	○	○	○				
	2	○	○	○				
	3	○	○	○				
	4	○	○	○				
	5	○	○	○	●	●	●	●
	6	○	○	○	●	●	●	●
M	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
K	**1**							
	2							
	3							
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●
H	**1**							
	2							
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill II™	VariMill II	VariMill II	VariMill II	VariMill II	VariMill II	VariMill II
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**57NE**	**57NE**	**57NE**	**57NE**	**57NE**	**5718**	**5718**
Page		B113	B113	B113	B113	B113	B114	B114
Flute		5	5	5	5	5	5	5
Diameter D1		10mm	10mm	10—20mm	12—25mm	12—25mm	6—25mm	6—25mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	X-Long	X-Long
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		—	0,50—2,00mm	0,50—4,00mm	—	0,50—4,00mm	—	0,5—4,00mm
Helix Angle		38°	38°	38°	38°	38°	43°	43°
Center Cutting		Yes	Yes	Yes	Yes	Yes	No	No
Neck		Yes	Yes	Yes	Yes	Yes	No	No
Materials								
P	**0**						●	●
	1						●	●
	2						●	●
	3						●	●
	4						●	●
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
K	**1**						●	●
	2						●	●
	3						●	●
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●
H	**1**						●	●
	2						●	●
	3						●	●
	4						●	●

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill III™	VariMill III	VariMill III	VariMill III	VariMill III	VariMill III	VariMill III
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**771E**	**771E**	**772E**	**772E**	**772E**	**772E**	**77NE**
Page		B122	B122	B122	B122	B122	B122	B122
Flute		7	7	7	7	7	7	7
Diameter D1		10—20mm	10—20mm	10—20mm	10—20mm	12—20mm	12—20mm	10—20mm
Shank								
Length of Cut		Regular	Regular	X-Long	X-Long	X-Long	X-Long	Regular
Corner Style								
Chamfer Size		0,5mm	—	0,5mm	—	0,5mm	—	0,5mm
Radius Sizes		—	0,5mm	—	0,5mm	—	0,5mm	—
Helix Angle		38°	38°	38°	38°	38°	38°	38°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	No	No	No	No	No	Yes
Materials								
P	**0**							
	1							
	2							
	3							
	4							
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
K	**1**							
	2							
	3							
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●
H	**1**							
	2							
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		VariMill III™	Roughers	Roughers	Roughers	Roughers	Roughers	Roughers
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**77NE**	**4906**	**4906**	**4976**	**49N6**	**4U50**	**4U80**
Page		B122	B128	B128	B129	B129	B130	B130
Flute		7	3 - 4	3 - 4 - 5	3 - 4	3 - 5	4 - 6	4 - 6
Diameter D1		10—20mm	4—20mm	4—25mm	4—20mm	6—20mm	6—25mm	6—25mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	Short	Regular
Corner Style								
Chamfer Size		—	0,30—0,50mm	0,30—0,50mm	0,30—0,50mm	0,30—0,50mm	—	—
Radius Sizes		0,5mm	—	—	—	—	0,30—1,00mm	0,30—1,00mm
Helix Angle		38°	30°	30°	30°	30°	45°	45°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		Yes	No	No	No	Yes	Yes	No
Materials								
P	**0**		●	●	●	●		
	1		●	●	●	●		
	2		●	●	●	●		
	3		●	●	●	●		
	4		●	●	●	●		
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	**1**	●	○	○	○	○	●	●
	2	●	○	○	○	○	●	●
	3	●	○	○	○	○	●	●
K	**1**		●	●	●	●		
	2		●	●	●	●		
	3		●	●	●	●		
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	●	○	○	○	○	●	●
	2	●	○	○	○	○	●	●
	3	●	○	○	○	○	●	●
	4	●	○	○	○	○	●	●
H	**1**		○	○	○	○		
	2		○	○	○	○		
	3							
	4							

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		Roughers	Roughers	Roughers	Roughers	Roughers	Roughers	Roughers
UOM		Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series		4U80	4U40	4U70	4U70	DQ13	DQ13	49H6
Page		B130	B131	B131	B131	B132	B132	B132
Flute		4–6	4	4–6	4–6	3	3	4
Diameter D1		6—16mm	8mm	6—20mm	6—16mm	3—4mm	3—18mm	10—16mm
Shank								
Length of Cut		Regular	Short	Regular	Regular	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	0,50—1,00mm	0,30—0,60mm	—	—	—
Radius Sizes		0,30—0,50mm	0,75mm	—	—	0,25mm	0,25—0,45mm	0,50mm
Helix Angle		45°	45°	45°	45°	30°	30°	30°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	Yes	No	No	No	No	No
Materials								
P	0					●	●	●
	1					●	●	●
	2					●	●	●
	3					●	●	●
	4					●	●	●
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	1	●	●	●	●	○	○	○
	2	●	●	●	●	○	○	○
	3	●	●	●	●	○	○	○
K	1					●	●	●
	2					●	●	●
	3					●	●	●
N	1							
	2							
	3							
	4							
	5							
S	1	●	●	●	●	○	○	○
	2	●	●	●	●	○	○	○
	3	●	●	●	●	○	○	○
	4	●	●	●	●	○	○	○
H	1					○	○	○
	2					○	○	○
	3							
	4							

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● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		Roughers	Finishers	Finisher	Finisher	Finisher	Finisher	Finisher
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**4940**	**DC03**	**4603**	**D503**	**D513**	**D507**	**D517**
Page		B133	B142	B142	B143	B143	B144	B144
Flute		4–6	3	3	3	3	6	6
Diameter D1		6—16mm	3—12mm	3—16mm	2—12mm	3—10mm	6—20mm	6—20mm
Shank								
Length of Cut		Short	Regular	Regular	Regular	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		0,75—1,00mm	0,25—0,45mm	—	—	—	—	—
Helix Angle		45°	35°	60°	45°	45°	45°	45°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	No	No	No	No	No	No
Materials								
P	**0**	●	●	●	●	●	●	●
	1	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●
	5	●	●	●	●	●	●	●
	6	●	●	●	●	●	●	●
M	**1**	○	●	●	●	●	●	●
	2	○	●	●	●	●	●	●
	3	○	●	●	●	●	●	●
K	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
N	**1**							
	2							
	3							
	4							
	5							
S	**1**	○	●	●	●	●	●	●
	2	○	●	●	●	●	●	●
	3	○	●	●	●	●	●	●
	4	○	●	●	●	●	●	●
H	**1**	○	●	●	●	●	●	●
	2	○	●	●	●	●	●	●
	3		●	●	●	●	●	●
	4		●	●	●	●	●	●

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● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		Finisher	Finisher	ALUFLASH™	ALUFLASH	ALUFLASH	ALUFLASH	ALUFLASH
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**4503 JJ**	**4001 JJ**	**2A09**	**2A09**	**3A09**	**3A09**	**3AN9**
Page		B145	B145	B152	B152	B153	B153	B154
Flute		3	2	2	2	3	3	3
Diameter D1		1—20mm	1—16mm	1—20mm	1—20mm	3mm	3—4mm	4—20mm
Shank								
Length of Cut		Regular	Regular	Regular	Regular	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		—	—	—	0,20—1,00mm	—	0,20—0,50mm	—
Helix Angle		45°	30°	37° / 39°	37° / 39°	37° / 39°	37° / 39°	37° / 39°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	Yes	No	No	No	No	Yes
Materials								
P	**0**	●	●					
	1	●	●					
	2	●	●					
	3	●	●					
	4	●	●					
	5	●	●					
	6	●	●					
M	**1**	●	●					
	2	●	●					
	3	●	●					
K	**1**	●	●					
	2	●	●					
	3	●	●					
N	**1**			●	●	●	●	●
	2			●	●	●	●	●
	3			●	●	●	●	●
	4			●	●	●	●	●
	5			●	●	●	●	●
S	**1**	●	●					
	2	●	●					
	3	●	●					
	4	●	●					
H	**1**	●	●					
	2	●	●					
	3	●	●					
	4	●	●					

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● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		ALUFLASH™	ALUFLASH	ALUFLASH	X-Feed™	X-Feed	X-Feed	X-Feed
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**3AN9**	**3AP9**	**3AP9**	**70N6**	**71N6**	**70NS**	**70N7**
Page		B155	B156	B156	B164	B164	B165	B165
Flute		3	3	3	6	6	6	6
Diameter D1		4—20mm	12mm	4—20mm	6—12mm	6—20mm	6—25mm	6—20mm
Shank								
Length of Cut		Regular	Long	Long	Long	Regular	Regular	Regular
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		0,20—5,00mm	—	0,20—4,00mm	—	—	—	—
Helix Angle		37° / 39°	37° / 39°	37° / 39°	20°	20°	20°	20°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Materials								
P	**0**				●	●		
	1				●	●		
	2				●	●		
	3				●	●		
	4				●	●		
	5						●	
	6						●	
M	**1**						●	
	2						●	
	3						●	
K	**1**							
	2							
	3							
N	**1**	●	●	●				
	2	●	●	●				
	3	●	●	●				
	4	●	●	●				
	5	●	●	●				
S	**1**						●	
	2						●	
	3				●	●	●	
	4				●	●	●	
H	**1**							●
	2							●
	3							●
	4							●

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		Vision Plus™	Vision Plus	Vision Plus	Vision Plus	Vision Plus	Vision Plus	Vision Plus
UOM		Metric	Metric	Metric	Metric	Metric	Metric	Metric
Series		7505	7515	7525	7545	7585	7595	75N2
Page		B170	B170	B170	B170	B171	B171	B172
Flute		4	4–6	4–5–6	4	4	4	3
Diameter D1		3—12mm	6—25mm	6—25mm	3—16mm	6—16mm	3—20mm	3—6mm
Shank								
Length of Cut		Regular	Long	Extended	Short	Short	Long	Regular
Corner Style								
Chamfer Size		–	–	–	–	–	–	–
Radius Sizes		–	–	–	–	0,25—1,00mm	0,25—2,00mm	0,30—1,00mm
Helix Angle		50°	50°	50°	50°	50°	50°	30°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	No	No	No	No	No	Yes
Materials								
P	0							
	1							
	2							
	3							
	4							
	5							
	6							
M	1							
	2							
	3							
K	1							
	2							
	3							
N	1							
	2							
	3							
	4							
	5							
S	1							
	2							
	3							
	4							
H	1	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		Vision Plus™	Vision Plus	Vision Plus	Vision Plus	Vision Plus	Vision Plus	Vision Plus
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**75N5**	**7670**	**D518**	**D618**	**7050**	**7060**	**7061**
Page		B172	B173	B173	B174	B174	B174	B175
Flute		4	6	4–6–8	4–6	4	4	2
Diameter D1		3—20mm	16mm	4—25mm	3—20mm	2—16mm	6—10mm	1—8mm
Shank								
Length of Cut		Regular	Short	Regular	Long	Regular	Regualr	Regular
Corner Style								
Chamfer Size		–	–	–	–	–	–	–
Radius Sizes		0,25—2,00mm	1mm	–	–	–	–	–
Helix Angle		50°	45°	50°	50°	15°	15°	15°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		Yes	Yes	No	No	No	No	No
Materials								
P	**0**							
	1							
	2							
	3							
	4							
	5							
	6							
M	**1**							
	2							
	3							
K	**1**							
	2							
	3							
N	**1**							
	2							
	3							
	4							
	5							
S	**1**							
	2							
	3							
	4							
H	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio						
		Vision Plus™	Vision Plus	Vision Plus	Vision Plus Micro	Vision Plus Micro	Vision Plus Micro	Vision Plus Micro
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**7150**	**7151**	**70N1**	**7N02**	**7N12**	**7N22**	**7N01**
Page		B175	B176	B176	B177–B178	B177–B178	B177–B178	B179
Flute		4	2	2	2	2	2	2
Diameter D1		3—12mm	1—12mm	1—12mm	0,3—2mm	1—4mm	0,4—3,05mm	0,3—6mm
Shank								
Length of Cut		Regular	Regular	—	Regular	Long	Extended	Regular
Corner Style								
Chamfer Size		—	—	—	—	—	—	—
Radius Sizes		—	—	—	—	—	—	—
Helix Angle		15°	15°	30°	30°	30°	30°	30°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck		No	No	Yes	Yes	Yes	Yes	Yes
Materials								
P	**0**							
	1							
	2							
	3							
	4							
	5							
	6							
M	**1**							
	2							
	3							
K	**1**							
	2							
	3							
N	**1**							
	2							
	3							
	4							
	5							
S	**1**							
	2							
	3							
	4							
H	**1**	●	●	●	●	●	●	●
	2	●	●	●	●	●	●	●
	3	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●

Hanita™ High-Performance Solid Carbide End Mills • Selection Guide • Metric

● first choice
○ alternate choice

		Hanita Solid End Milling Portfolio					
		Vision Plus™ Micro	HSS Roughers	HSS Roughers	WavCut I™	WavCut I	WavCut I
UOM		**Metric**	**Metric**	**Metric**	**Metric**	**Metric**	**Metric**
Series		**7N21**	**60N6**	**6LN6**	**660W**	**661W**	**664W**
Page		B179	B196	B196	B197	B197	B197
Flute		2	4–5	4–5	5–6	6–8	5–6
Diameter D1		0,5—3mm	6—30mm	12—25mm	25—50mm	25—50mm	25—50mm
Shank							
Length of Cut		Regular	Regular	Regular	Regular	Long	Short
Corner Style							
Chamfer Size		—	0,25—0,50mm	0,35—0,5mm	1mm	1mm	1mm
Radius Sizes		—	—	—	—	—	—
Helix Angle		30°	30°	30°	35°	35°	35°
Center Cutting		Yes	Yes	Yes	Yes	Yes	Yes
Neck		Yes	No	Yes	No	No	No
Materials							
P	**0**		●	●			
	1		●	●			
	2		●	●			
	3		●	●			
	4		●	●			
	5		●	●			
	6		●	●			
M	**1**		●	●	●	●	●
	2		●	●	●	●	●
	3		●	●	●	●	●
K	**1**		●	●			
	2		●	●			
	3		●	●			
N	**1**						
	2						
	3						
	4						
	5						
S	**1**		●	●	●	●	●
	2		●	●	●	●	●
	3		●	●	●	●	●
	4		●	●	●	●	●
H	**1**	●					
	2	●					
	3	●					
	4	●					

VariMill™ XTREME™

High-Performance Solid End Milling

VariMill XTREME is for CNC machining companies seeking a versatile solution capable of machining a broad range of materials while ensuring a high productivity output to reduce manufacturing costs through aggressive machining conditions.

Built-in features to enable aggressive versatility.

Twisted end face to improve edge stability, which enables aggressive ramping angles and helical capability.

Non-linear chip gashes for improved chip evacuation, enabling the ramping function and z-axis machining.

Asymmetrical divided flute and variable helix angle for reduced vibrations.

Parabolic core for increased tool stability and reduced deflection and risk of breakage.

VariMill XTREME will dominate the shop floor through productive output due to its versatile offering and ability to machine a broad range of materials in aggressive cutting conditions.

AGGRESSIVE

Exceeds expectations in aggressive cutting parameters.

PRODUCTIVE

Improved chip evacuation and increased edge/corner strength to reduce any risk of breakage while pushing the cutting parameters to the limit.

VERSATILE

Capable of machining a broad range of materials (steel, stainless steel, cast iron, super alloys), provides high-performance and tool life in a variety of operations including ramping, slotting, plunging, drilling, helical interpolation, and dynamic milling.

AGGRESSIVE VERSATILITY

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
WS15PE	4

DIAMETER RANGE

METRIC
3–25mm

INDUSTRY

GENERAL ENGINEERING

ENERGY

AEROSPACE

APPLICATIONS

MATERIALS

P M K S H

SIDE MILLING

SLOTTING

HELICAL INTERPOLATION

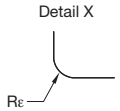
RAMPING

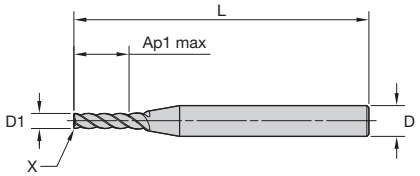
DYNAMIC MILLING

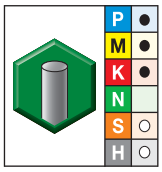
PLUNGING

DRILLING

VariMill XTREME • Series 4X0E • Radiused • 4 Flute • Cylindrical Shank • Metric





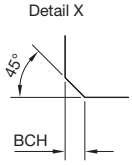


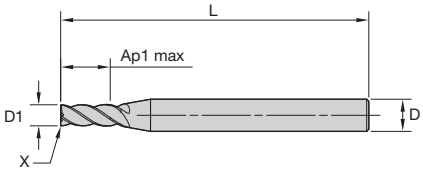
● first choice
○ alternate choice

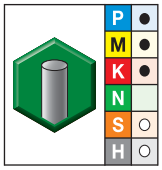
WS15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
6829314	4X0EM03002RAT	3,0	6	9,50	57	0,20	4
6830480	4X0EM25008RKT	25,0	25	50,00	121	1,50	4
6830671	4X0EM25008RPT	25,0	25	50,00	121	3,00	4

VariMill XTREME • Series 4X0E • Chamfered • 4 Flute • Cylindrical Shank • Metric





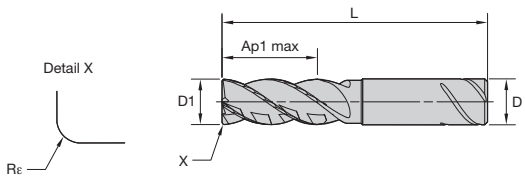


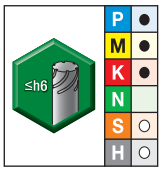
● first choice
○ alternate choice

WS15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
6829315	4X0EM04002CST	4,0	6	8,00	57	0,10	4
6829320	4X0EM05002CST	5,0	6	10,00	57	0,10	4
6829695	4X0EM06002CST	6,0	6	12,00	57	0,10	4
6829881	4X0EM08003CAT	8,0	8	16,00	63	0,20	4
6829888	4X0EM10004CAT	10,0	10	20,00	72	0,20	4
6830075	4X0EM12005CCT	12,0	12	24,00	83	0,30	4

VariMill XTREME • Series 4X0E • Radiused • 4 Flute • Safe-Lock™ Shank • Metric



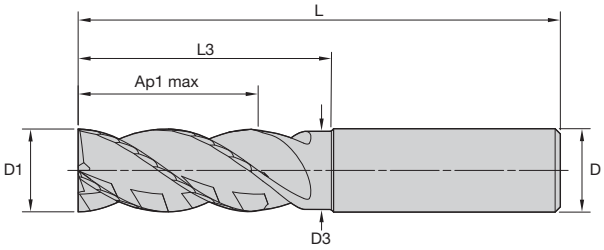


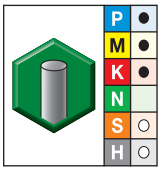
● first choice
○ alternate choice

WS15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
6830479	4X0EM25018RJV	25,0	25	50,00	135	1,00	4

VariMill XTREME • Series 4XNE • Square End • 4 Flute • Necked • Cylindrical Shank • Metric



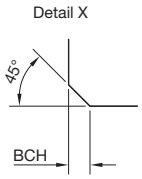


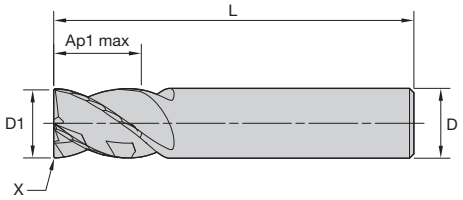
● first choice
○ alternate choice

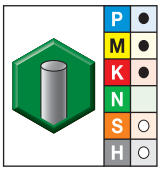
WS15PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	ZU
6829316	4XNEM04002SZT	4,0	6	3,76	8,00	12,00	57	4
6829691	4XNEM05002SZT	5,0	6	4,70	10,00	15,00	57	4
6829696	4XNEM06002SZT	6,0	6	5,64	12,00	18,00	57	4
6829882	4XNEM08003SZT	8,0	8	7,52	16,00	24,00	63	4
6829889	4XNEM10004SZT	10,0	10	9,40	20,00	30,00	72	4
6830076	4XNEM12005SZT	12,0	12	11,28	24,00	36,00	83	4
6830284	4XNEM16006SZT	16,0	16	15,04	32,00	48,00	92	4
6830472	4XNEM20007SZT	20,0	20	18,80	40,00	60,00	115	4

VariMill XTREME • Series 4XNE • Chamfered • 4 Flute • Cylindrical Shank • Metric





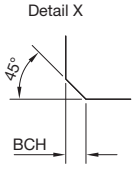


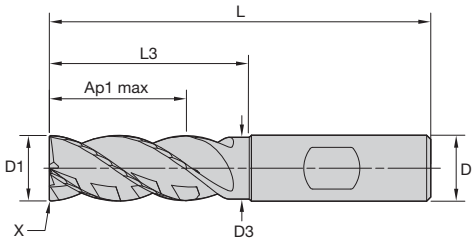
● first choice
○ alternate choice

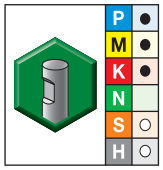
WS15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
6830283	4X0EM16006CCT	16,0	16	18,00	82	0,30	4

VariMill XTREME • Series 4XNE • Chamfered • 4 Flute • Necked • Weldon® Shank • Metric





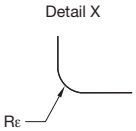


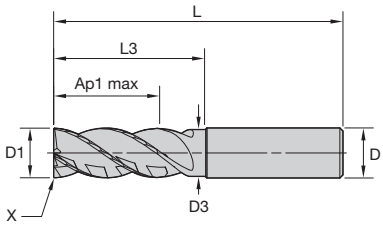
● first choice
○ alternate choice

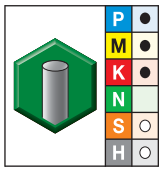
WS15PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU
6829319	4XNEM04002CSW	4,0	6	3,76	12,00	16,00	57	0,10	4
6829694	4XNEM05002CSW	5,0	6	4,70	13,00	18,00	57	0,10	4
6829700	4XNEM06002CSW	6,0	6	5,64	13,00	21,00	57	0,10	4
6829887	4XNEM08003CAW	8,0	8	7,52	16,00	27,00	63	0,20	4
6830074	4XNEM10004CAW	10,0	10	9,40	22,00	32,00	72	0,20	4
6830282	4XNEM12005CCW	12,0	12	11,28	26,00	36,00	83	0,30	4
6830285	4XNEM16006CCW	16,0	16	15,04	32,00	48,00	92	0,30	4
6830473	4XNEM20007CCW	20,0	20	18,80	40,00	60,00	115	0,30	4

VariMill XTREME • Series 4XNE • Radiused • 4 Flute • Necked • Cylindrical Shank • Metric





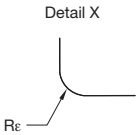


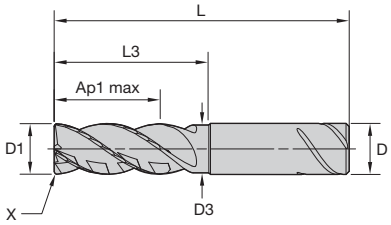
● first choice
○ alternate choice

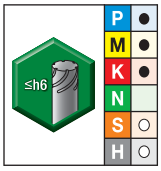
WS15PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
6829317	4XNEM04002RAT	4,0	6	3,76	8,00	12,00	57	0,20	4
6829318	4XNEM04002RET	4,0	6	3,76	8,00	12,00	57	0,50	4
6829692	4XNEM05002RAT	5,0	6	4,70	10,00	15,00	57	0,20	4
6829693	4XNEM05002RET	5,0	6	4,70	10,00	15,00	57	0,50	4
6829697	4XNEM06002RAT	6,0	6	5,64	12,00	18,00	57	0,20	4
6829698	4XNEM06002RET	6,0	6	5,64	12,00	18,00	57	0,50	4
6829699	4XNEM06002RJT	6,0	6	5,64	12,00	18,00	57	1,00	4
6829883	4XNEM08003RAT	8,0	8	7,52	16,00	24,00	63	0,20	4
6829884	4XNEM08003RET	8,0	8	7,52	16,00	24,00	63	0,50	4
6829885	4XNEM08003RJT	8,0	8	7,52	16,00	24,00	63	1,00	4
6829886	4XNEM08003RKT	8,0	8	7,52	16,00	24,00	63	1,50	4
6829890	4XNEM10004RCT	10,0	10	9,40	20,00	30,00	72	0,30	4
6830071	4XNEM10004RET	10,0	10	9,40	20,00	30,00	72	0,50	4
6830072	4XNEM10004RJT	10,0	10	9,40	20,00	30,00	72	1,00	4
6830073	4XNEM10004RKT	10,0	10	9,40	20,00	30,00	72	1,50	4
6830077	4XNEM12005RET	12,0	12	11,28	24,00	36,00	83	0,50	4
6830079	4XNEM12005RKT	12,0	12	11,28	24,00	36,00	83	1,50	4
6830080	4XNEM12005RMT	12,0	12	11,28	24,00	36,00	83	2,00	4
6830281	4XNEM12005RPT	12,0	12	11,28	24,00	36,00	83	3,00	4
6830286	4XNEM16006RET	16,0	16	15,04	32,00	48,00	92	0,50	4
6830288	4XNEM16006RKT	16,0	16	15,04	32,00	48,00	92	1,50	4
6830289	4XNEM16006RPT	16,0	16	15,04	32,00	48,00	92	3,00	4
6830471	4XNEM16006RQT	16,0	16	15,04	32,00	48,00	92	4,00	4
6830474	4XNEM20007RET	20,0	20	18,80	40,00	60,00	115	0,50	4
6830476	4XNEM20007RKT	20,0	20	18,80	40,00	60,00	115	1,50	4
6830477	4XNEM20007RPT	20,0	20	18,80	40,00	60,00	115	3,00	4
6830478	4XNEM20007RRT	20,0	20	18,80	40,00	60,00	115	5,00	4

VariMill XTREME • Series 4XNE • Radiused • 4 Flute • Necked • Safe-Lock™ Shank • Metric







● first choice
○ alternate choice

WS15PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
6830078	4XNEM12005RJV	12,0	12	11,28	24,00	36,00	83	1,00	4
6830287	4XNEM16006RJV	16,0	16	15,04	32,00	48,00	92	1,00	4
6830475	4XNEM20007RJV	20,0	20	18,80	40,00	60,00	115	1,00	4

VariMill XTREME • Side Milling and Slotting • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WS15PE Cutting Speed — vc m/min			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B				D1 — Diameter												
		ap	ae	ap	min	Start	max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D1	0,5 x D1	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	1	1,5 x D1	0,5 x D1	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,5 x D1	0,5 x D1	1,25 x D1	140	165	190	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	3	1,5 x D1	0,5 x D1	1,25 x D1	120	140	160	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	4	1,5 x D1	0,5 x D1	1,25 x D1	90	120	150	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	5	1,5 x D1	0,5 x D1	1,25 x D1	60	80	100	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	6	1,5 x D1	0,5 x D1	1,25 x D1	50	65	75	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
M	1	1,5 x D1	0,5 x D1	1,25 x D1	90	100	115	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	2	1,5 x D1	0,5 x D1	1,25 x D1	60	70	80	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	3	1,5 x D1	0,5 x D1	1,0 x D1	60	65	70	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
K	1	1,5 x D1	0,5 x D1	1,0 x D1	120	135	150	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,5 x D1	0,5 x D1	1,0 x D1	110	125	140	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	3	1,5 x D1	0,5 x D1	1,0 x D1	110	120	130	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
S	1	1,5 x D1	0,5 x D1	0,75 x D1	50	70	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D1	0,5 x D1	0,75 x D1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D1	0,5 x D1	0,5 x D1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D1	0,5 x D1	1,25 x D1	50	55	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D1	0,5 x D1	1,0 x D1	80	110	140	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	2	1,5 x D1	0,5 x D1	1,0 x D1	70	90	120	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078

NOTE: See page B92 for more information on VARIMILL XTREME adjustment factors for feed calculations.

VariMill XTREME • Ramping • Application Data • WS15PE • Metric

Material Group		Helical Interpolation/ Ramping 0°–15°	WS15PE Cutting Speed — vc m/min			Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping — fz x 2												
						Diameter — D1 [Ømin – Ømax]												
						mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
		Max Depth	min	Start	max	min–max	3,5–5.7	4,6–7,6	5,8–9,5	6,9–11,4	9,2–15,2	11,5–19,0	13,8–22,8	16,1–26,6	18,4–30,4	20,7–34,2	23,0–38,0	28,8–47,5
P	0	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	1	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,25 x D1	140	165	190	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	3	1,25 x D1	120	140	160	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	4	1,25 x D1	90	120	150	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	5	1,25 x D1	60	80	100	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	6	1,25 x D1	50	65	75	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
M	1	1,25 x D1	90	100	115	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	2	1,25 x D1	60	70	80	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	3	1,0 x D1	60	65	70	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
K	1	1,0 x D1	120	135	150	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,0 x D1	110	125	140	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	3	1,0 x D1	110	120	130	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
S	1	0,75 x D1	50	70	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,75 x D1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	0,5 x D1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,25 x D1	50	55	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,0 x D1	80	110	140	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	2	1,0 x D1	70	90	120	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078

VariMill XTREME • Ramping • Application Data • WS15PE • Metric

Material Group		Helical Interpolation/ Ramping 15°–30°	WS15PE Cutting Speed — vc m/min			Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping — fz x 2												
						Diameter — D1 [Ømin – Ømax]												
						mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
		Max Depth	min	Start	max	min–max	3,5–5.7	4,6–7,6	5,8–9,5	6,9–11,4	9,2–15,2	11,5–19,0	13,8–22,8	16,1–26,6	18,4–30,4	20,7–34,2	23,0–38,0	28,8–47,5
P	0	1,25 x D1	150	165	175	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	1	1,25 x D1	150	165	175	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	2	1,25 x D1	140	155	165	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	3	1,25 x D1	120	130	140	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	4	1,25 x D1	90	105	120	fz	0,013	0,018	0,022	0,027	0,037	0,045	0,051	0,058	0,063	0,068	0,073	0,080
	5	1,25 x D1	60	70	80	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	6	1,25 x D1	50	55	65	fz	0,010	0,013	0,017	0,020	0,028	0,033	0,038	0,043	0,047	0,050	0,053	0,059
M	1	1,25 x D1	90	95	100	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	2	1,25 x D1	60	65	70	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	3	1,0 x D1	60	62	65	fz	0,010	0,013	0,017	0,020	0,028	0,033	0,038	0,043	0,047	0,050	0,053	0,059
K	1	1,0 x D1	120	130	135	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	2	1,0 x D1	110	120	125	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	3	1,0 x D1	110	115	120	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
S	1	0,75 x D1	50	60	70	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	2	0,75 x D1	25	27	30	fz	0,008	0,010	0,013	0,016	0,022	0,026	0,031	0,035	0,038	0,042	0,045	0,051
	3	0,5 x D1	25	27	30	fz	0,008	0,010	0,013	0,016	0,022	0,026	0,031	0,035	0,038	0,042	0,045	0,051
	4	1,25 x D1	50	52	55	fz	0,009	0,013	0,017	0,021	0,030	0,037	0,043	0,048	0,053	0,057	0,061	0,069
H	1	1,0 x D1	80	95	110	fz	0,013	0,018	0,022	0,027	0,037	0,045	0,051	0,058	0,063	0,068	0,073	0,080
	2	1,0 x D1	70	80	90	fz	0,010	0,013	0,017	0,020	0,028	0,033	0,038	0,043	0,047	0,050	0,053	0,059

Material Group		Helical Interpolation/ Ramping 30°–45°	WS15PE Cutting Speed — vc m/min			Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping — fz x 2												
						Diameter — D1 [Ømin – Ømax]												
						mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
		Max Depth	min	Start	max	min–max	3,5–5.7	4,6–7,6	5,8–9,5	6,9–11,4	9,2–15,2	11,5–19,0	13,8–22,8	16,1–26,6	18,4–30,4	20,7–34,2	23,0–38,0	28,8–47,5
P	0	1,25 x D1	140	150	165	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	1	1,25 x D1	140	150	165	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	2	1,25 x D1	140	150	165	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	3	1,25 x D1	105	115	120	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	4	1,25 x D1	90	100	110	fz	0,011	0,014	0,018	0,022	0,030	0,036	0,041	0,046	0,051	0,055	0,058	0,064
	5	1,25 x D1	70	75	80	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
	6	1,25 x D1	55	60	65	fz	0,008	0,011	0,013	0,016	0,022	0,027	0,031	0,034	0,038	0,040	0,043	0,047
M	1	1,25 x D1	75	85	90	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	2	1,25 x D1	50	55	60	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
	3	1,0 x D1	45	50	55	fz	0,008	0,011	0,013	0,016	0,022	0,027	0,031	0,034	0,038	0,040	0,043	0,047
K	1	1,0 x D1	110	120	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	2	1,0 x D1	100	110	120	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	3	1,0 x D1	90	100	110	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
S	1	0,75 x D1	80	85	90	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	2	0,75 x D1	20	25	28	fz	0,006	0,008	0,011	0,013	0,017	0,021	0,025	0,028	0,031	0,033	0,036	0,040
	3	0,5 x D1	20	25	28	fz	0,006	0,008	0,011	0,013	0,017	0,021	0,025	0,028	0,031	0,033	0,036	0,040
	4	1,25 x D1	35	40	45	fz	0,008	0,010	0,014	0,017	0,024	0,029	0,034	0,038	0,042	0,046	0,049	0,055
H	1	1,0 x D1	75	80	85	fz	0,011	0,014	0,018	0,022	0,030	0,036	0,041	0,046	0,051	0,055	0,058	0,064
	2	1,0 x D1	65	70	75	fz	0,008	0,011	0,013	0,016	0,022	0,027	0,031	0,034	0,038	0,040	0,043	0,047

VariMill XTREME • Plunging/Drilling • Application Data • WS15PE • Metric

Material Group		Plunging/Drilling			WS15PE Cutting Speed — vc m/min			Recommended feed per revolution (fn =mm/rev) for plunging and drilling — D1 — Diameter												
		Max Depth	Applicable	Coolant	min	Start	max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	●	Preferred	140	150	165	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	1	1,5 x D	●	Required	140	150	165	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	2	1,5 x D	●	Required	140	150	165	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	3	1 x D	●	Required	105	115	120	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	4	1 x D	●	Required	90	100	110	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	5	0,5 x D	●	Required	70	75	80	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
	6	0,5 x D	●	Required	55	60	65	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
M	1	0,75 x D	●	Required	75	85	90	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	2	0,5 x D	●	Required	50	55	60	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
	3	0,5 x D	●	Required	45	50	55	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
K	1	1,5 x D	●	Preferred	110	120	130	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	2	1 x D	●	Required	100	110	120	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	3	1 x D	●	Required	90	100	110	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
S	1	0,3 x D	○	Required	80	85	90	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	2	0,1 x D	○	Required	20	25	28	fn	0,010	0,012	0,015	0,018	0,022	0,028	0,033	0,040	0,045	0,050	0,060	0,070
	3	0,1 x D	○	Required	20	25	28	fn	0,010	0,012	0,015	0,018	0,022	0,028	0,033	0,040	0,045	0,050	0,060	0,070
	4	0,2 x D	○	Required	35	40	45	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
H	1	0,3 x D	○	Required	75	80	85	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	2	0,2 x D	○	Required	65	70	75	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100

VariMill XTREME • Adjustment Factor Table for Feed Calculation

Metric

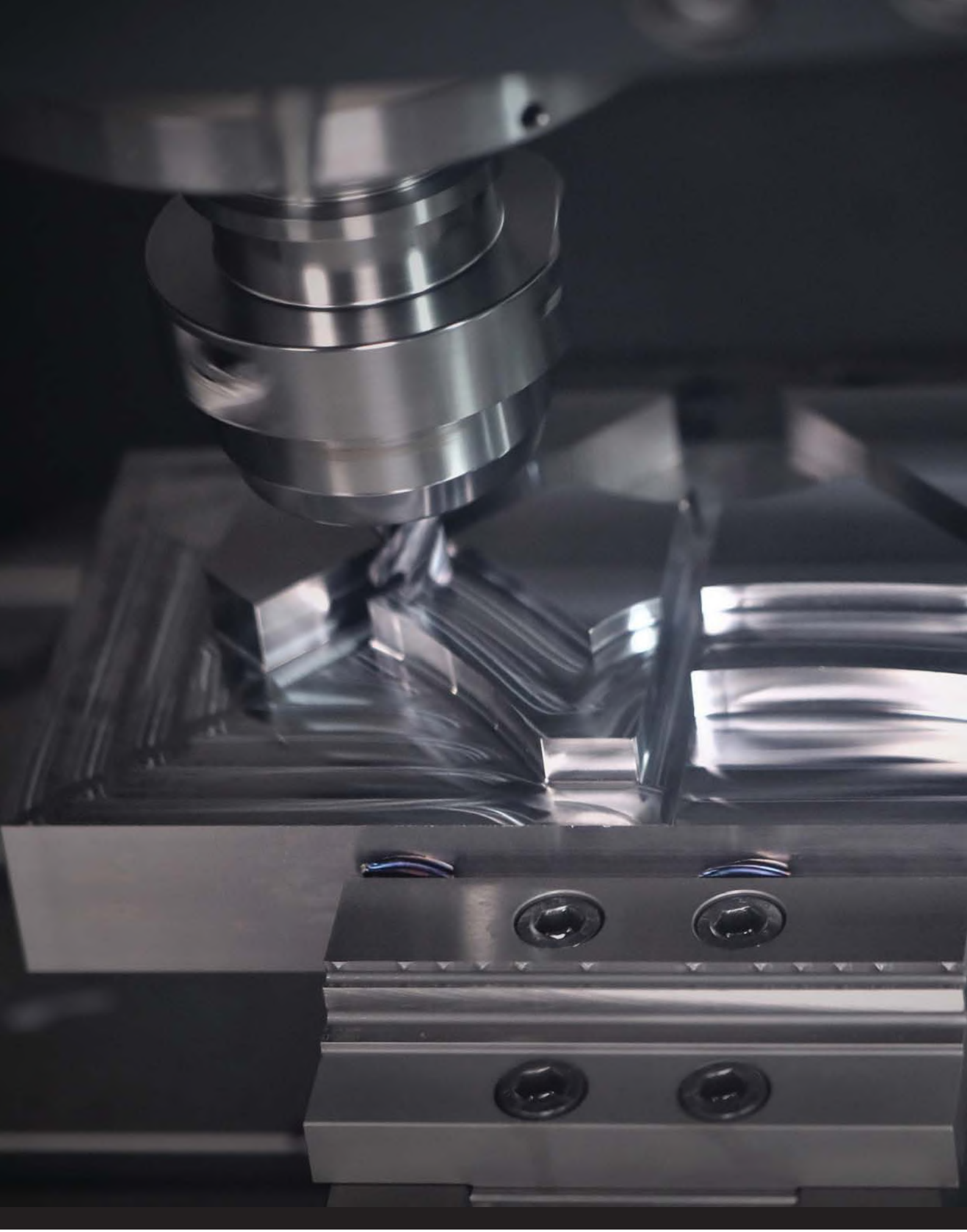
	Ae/D	2%	4%	5%	8%	10%	20%	30%	40%	50%
Speed factor	Kv	2	1,5	1,45	1,4	1,35	1,25	1,2	1	1
Feed factor	KFz	2,4	2,3	2,2	2	1,7	1,25	1,02	1	1

To calculate application-specific cutting data, please use Kv coefficient table to the right for adaptation of cutting speed and KFz for feed, respectively.

*Vc new = Vc * Kv*
*Fz new = IPT * KFz*

Calculation example:
Application: D = 20mm; M2 material group;
Ae = 2mm
Cutting data recommendation: Vc = 80 m/min;
Fz = 0,089 mm/th
Adjustment coefficients: Ae = 2mm equals 10,0%;
Kv = 1,35; KFz = 1,7

Final cutting data recommendation:
*Vc new = 80 * 1,35 = 108 m/min*
*Fz new = 0,089 * 1,7 = 0,15 mm/min*



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HANITA™

VariMill I™

High-Performance Solid End Milling

The VariMill I end mill family is for CNC machine shops looking for an all-around tool with a wide standard product range capable of machining multiple materials, covering configurations from a long length-of-cut through a ball nose profile for 3D machining applications.

Features and Benefits

Unequal flute spacing to cut harmonics and reduce the development of vibrations during cutting.

Center cutting for improved ramping capabilities and plunging.

38° helix angle to provide the best combination between a roughing and a finishing tool.

Unique core design to offer maximum room for chip evacuation while keeping the tool design stable.

VariMill I offers plunging, slotting, and profiling at the highest possible feed rates for a wide range of materials. It is designed to provide maximum metal removal rates (MRR) and to achieve superior surface conditions. A wide range of diameters and corner configurations, such as chamfer, radii, and sharp edges, are available from stock.

STABLE

Unequal flute spacing design to ensure low vibrations and high cutting stability.

EASY

With its advanced geometry, machinist will be able to apply VariMill I with confidence.

VERSATILE

Roughing and finishing operations in one single tool with the capability to work on multiple materials.

CHATTER-FREE VERSATILITY

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
WP15PE WS15PE TiAlN	4

DIAMETER RANGE

METRIC
4–25mm

INDUSTRY

- GENERAL ENGINEERING
- AEROSPACE
- ENERGY
- TRANSPORTATION

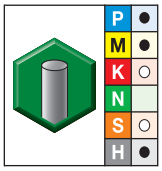
APPLICATIONS

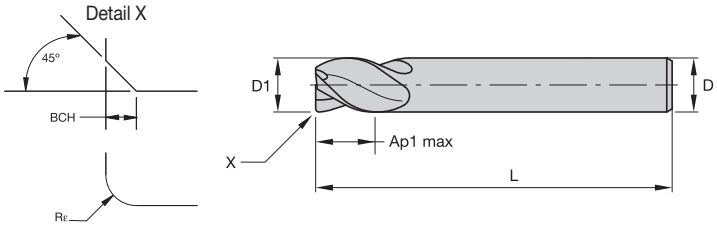
MATERIALS

P M K S H

- SIDE MILLING
- RAMPING
- HELICAL INTERPOLATION
- SLOTTING
- DYNAMIC MILLING
- PLUNGING

VariMill I • Series 4777 • Square End • 4 Flute • Metric



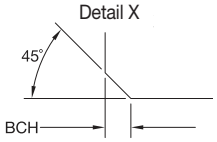


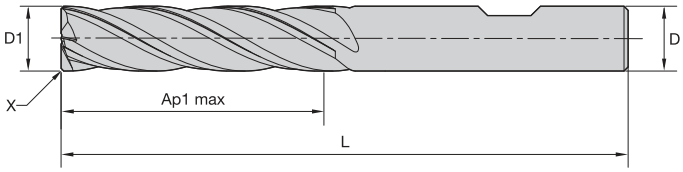
● first choice
○ alternate choice

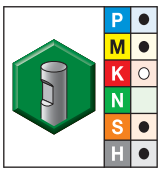
WP15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	BCH	ZU
5576753	477704001T	4,0	6	12,00	55	0,20	–	4
5576751	477704002T	4,0	6	12,00	55	–	0,40	4
5576754	4777040Z2T	4,0	6	12,00	55	–	–	4
5576755	477705002T	5,0	6	13,00	57	–	0,40	4
5576757	477705012T	5,0	6	13,00	57	0,20	–	4
5576758	4777050Z2T	5,0	6	13,00	57	–	–	4
5576759	477706002T	6,0	6	13,00	57	–	0,40	4
5576760	477706002W	6,0	6	13,00	57	–	0,40	4
5576761	477706012T	6,0	6	13,00	57	0,20	–	4
6471861	4777060R2TE	6,0	6	13,00	57	0,50	–	4
6471862	4777060R2TJ	6,0	6	13,00	57	1,00	–	4
5576762	4777060Z2T	6,0	6	13,00	57	–	–	4
5576763	477707003T	7,0	8	16,00	63	–	0,40	4
5576765	477707013T	7,0	8	16,00	63	0,20	–	4
5576766	4777070Z3T	7,0	8	16,00	63	–	–	4
5576767	477708003T	8,0	8	16,00	63	–	0,40	4
5576768	477708003W	8,0	8	16,00	63	–	0,40	4
5576769	477708013T	8,0	8	16,00	63	0,20	–	4
6471863	4777080R3TE	8,0	8	16,00	63	0,50	–	4
6471864	4777080R3TJ	8,0	8	16,00	63	1,00	–	4
6471865	4777080R3TK	8,0	8	16,00	63	1,50	–	4
6471866	4777080R3TM	8,0	8	16,00	63	2,00	–	4
5576770	4777080Z3T	8,0	8	16,00	63	–	–	4
5576771	477709004T	9,0	10	19,00	72	–	0,50	4
5576773	477709014T	9,0	10	19,00	72	0,20	–	4
5576774	4777090Z4T	9,0	10	19,00	72	–	–	4
5576775	477710004T	10,0	10	22,00	72	–	0,50	4
5576776	477710004W	10,0	10	22,00	72	–	0,50	4
5576777	477710024T	10,0	10	22,00	72	0,30	–	4
6471867	4777100R4TE	10,0	10	22,00	72	0,50	–	4
6471868	4777100R4TJ	10,0	10	22,00	72	1,00	–	4
6471869	4777100R4TK	10,0	10	22,00	72	1,50	–	4
6471870	4777100R4TM	10,0	10	22,00	72	2,00	–	4
6471871	4777100R4TN	10,0	10	22,00	72	2,50	–	4
5576778	4777100Z4T	10,0	10	22,00	72	–	–	4
5576779	4777110Z5T	11,0	12	26,00	83	–	–	4
5576790	477712005T	12,0	12	26,00	83	–	0,50	4
5576791	477712005W	12,0	12	26,00	83	–	0,50	4
5576792	477712025T	12,0	12	26,00	83	0,30	–	4
6471872	4777120R5TE	12,0	12	26,00	83	0,50	–	4
6471873	4777120R5TJ	12,0	12	26,00	83	1,00	–	4
6471874	4777120R5TK	12,0	12	26,00	83	1,50	–	4
6471875	4777120R5TM	12,0	12	26,00	83	2,00	–	4
6471876	4777120R5TN	12,0	12	26,00	83	2,50	–	4
6471877	4777120R5TP	12,0	12	26,00	83	3,00	–	4
5576793	4777120Z5T	12,0	12	26,00	83	–	–	4
5576795	477714014W	14,0	14	26,00	83	–	0,50	4
5576794	477714015T	14,0	14	26,00	83	–	0,50	4
5576796	477716006T	16,0	16	32,00	92	–	0,50	4
5576797	477716006W	16,0	16	32,00	92	–	0,50	4
5576798	477716026T	16,0	16	32,00	92	0,30	–	4
6471878	4777160R6TJ	16,0	16	32,00	92	1,00	–	4
6471879	4777160R6TM	16,0	16	32,00	92	2,00	–	4
6471880	4777160R6TP	16,0	16	32,00	92	3,00	–	4
6471891	4777160R6TQ	16,0	16	32,00	92	4,00	–	4
5576799	4777160Z6T	16,0	16	32,00	92	–	–	4
5576810	477718018T	18,0	18	32,00	92	–	0,50	4
5576812	477720007T	20,0	20	38,00	104	–	0,50	4
5576813	477720007W	20,0	20	38,00	104	–	0,50	4
5576814	47772002T	20,0	20	38,00	104	0,30	–	4
6471892	4777200R7TP	20,0	20	38,00	104	3,00	–	4
5576816	477725008T	25,0	25	45,00	121	–	0,50	4
5576817	477725008W	25,0	25	45,00	121	–	0,50	4
6471893	4777250R8TR	25,0	25	45,00	121	5,00	–	4

VariMill I • Series 4717 • Square End • Long Length • 4 Flute • Metric





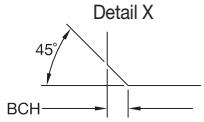


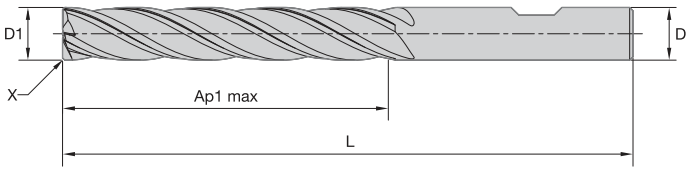
● first choice
○ alternate choice

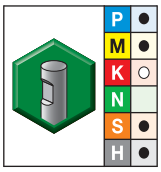
TiAlN-LW

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
3641112	471706002LW	6,0	6	32,00	76	0,40	4
3641113	471708003LW	8,0	8	32,00	87	0,40	4
3641114	471710004LW	10,0	10	38,00	89	0,50	4
3641115	471712005LW	12,0	12	51,00	100	0,50	4
3641116	471716006LW	16,0	16	57,00	125	0,50	4
3641117	471720007LW	20,0	20	57,00	125	0,50	4

VariMill I • Series 4727 • Square End • Extended Length • 4 Flute • Metric





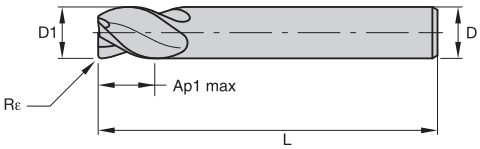


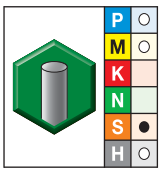
● first choice
○ alternate choice

TiAlN-LW

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
3641118	472712005LW	12,0	12	76,00	125	0,50	4
3641119	472716006LW	16,0	16	76,00	150	0,50	4
3641120	472720007LW	20,0	20	102,00	175	0,50	4

VariMill I • Series 4778 • Square End • 4 Flute • Metric



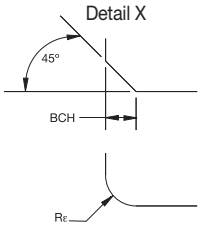


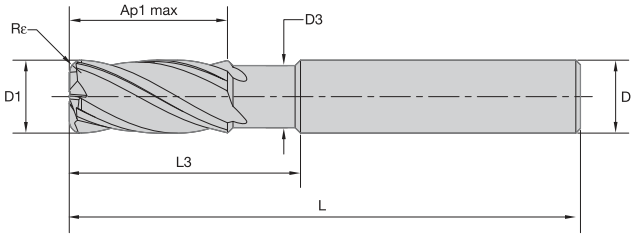
● first choice
○ alternate choice

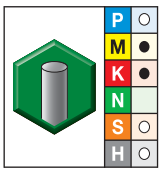
WS15PE

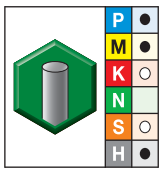
order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
2545563	477804002MT	4,0	6	12,00	55	0,20	4
2545564	477805002MT	5,0	6	13,00	57	0,20	4
2545565	477806002MT	6,0	6	13,00	57	0,20	4
2545570	477807003MT	7,0	8	16,00	63	0,20	4
2545603	477808003MT	8,0	8	16,00	63	0,20	4
2601245	477810004MT	10,0	10	22,00	72	0,30	4
2601246	477812005MT	12,0	12	26,00	83	0,30	4
2601248	477814014MT	14,0	14	26,00	83	0,30	4
2601249	477816006MT	16,0	16	32,00	92	0,30	4
2601251	477820007MT	20,0	20	38,00	104	0,30	4

VariMill I • Series 47N7 • Square End • Neck • 4 Flute • Metric





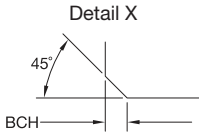


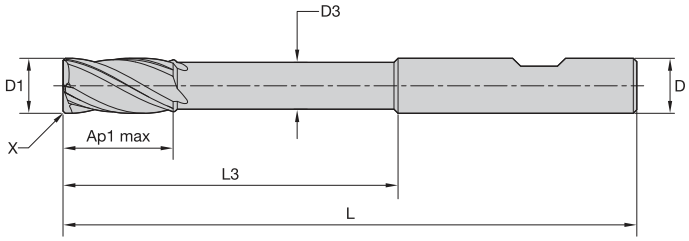


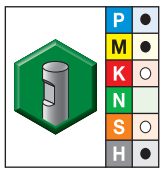
● first choice
○ alternate choice

WP15PE		TiAlN-LT										
order #	catalogue #	order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	BCH	ZU
	–	3462450	47N704002LT	4,0	6	3,60	12,00	16,00	55	0,40	–	4
	–	3462451	47N704012LT	4,0	6	3,60	12,00	16,00	55	0,50	–	4
	–	3462453	47N704022LT	4,0	6	3,60	12,00	16,00	55	1,00	–	4
	–	3462454	47N705002LT	5,0	6	4,60	13,00	18,00	57	0,50	–	4
	–	3462455	47N705012LT	5,0	6	4,60	13,00	18,00	57	1,00	–	4
	–	3462457	47N706002LT	6,0	6	5,50	13,00	21,00	57	0,50	–	4
	–	3462459	47N706012LT	6,0	6	5,50	13,00	21,00	57	1,00	–	4
6522659	47N7060R2TK	3462461	47N706022LT	6,0	6	5,50	13,00	21,00	57	1,50	–	4
6522658	47N7060C2W		–	6,0	6	5,50	13,00	21,00	57	–	0,40	4
	–	3462462	47N708003LT	8,0	8	7,50	16,00	27,00	63	0,50	–	4
	–	3462464	47N708013LT	8,0	8	7,50	16,00	27,00	63	1,00	–	4
6522681	47N7080R3TK	3462466	47N708023LT	8,0	8	7,50	16,00	27,00	63	1,50	–	4
	–	3462467	47N708033LT	8,0	8	7,50	16,00	27,00	63	2,00	–	4
6522660	47N7080C3W		–	8,0	8	7,50	16,00	27,00	63	–	0,40	4
	–	3462468	47N710004LT	10,0	10	9,50	22,00	32,00	72	0,50	–	4
	–	3462470	47N710014LT	10,0	10	9,50	22,00	32,00	72	1,00	–	4
6522683	47N7100R4TK	3462472	47N710024LT	10,0	10	9,50	22,00	32,00	72	1,50	–	4
	–	3462473	47N710034LT	10,0	10	9,50	22,00	32,00	72	2,00	–	4
6522682	47N7100C4W		–	10,0	10	9,50	22,00	32,00	72	–	0,50	4
	–	3462475	47N712005LT	12,0	12	11,50	26,00	38,00	83	0,50	–	4
	–	3462477	47N712015LT	12,0	12	11,50	26,00	38,00	83	1,00	–	4
6522685	47N7120R5TK	3462479	47N712025LT	12,0	12	11,50	26,00	38,00	83	1,50	–	4
	–	3462480	47N712035LT	12,0	12	11,50	26,00	38,00	83	2,00	–	4
	–	3462482	47N712045LT	12,0	12	11,50	26,00	38,00	83	4,00	–	4
6522684	47N7120C5W		–	12,0	12	11,50	26,00	38,00	83	–	0,50	4
6522686	47N7120R5TP		–	12,0	12	11,50	26,00	38,00	83	3,00	–	4
	–	3462484	47N716006LT	16,0	16	15,00	32,00	44,00	92	1,00	–	4
	–	3462486	47N716016LT	16,0	16	15,00	32,00	44,00	92	2,00	–	4
	–	3462488	47N716026LT	16,0	16	15,00	32,00	44,00	92	4,00	–	4
6522687	47N7160C6W		–	16,0	16	15,00	32,00	44,00	92	–	0,50	4
6522688	47N7160R6TE		–	16,0	16	15,00	32,00	44,00	92	0,50	–	4
6522689	47N7160R6TP		–	16,0	16	15,00	32,00	44,00	92	3,00	–	4
3462491	47N720007MT	3462490	47N720007LT	20,0	20	19,00	38,00	55,00	104	1,00	–	4
	–	3462492	47N720017LT	20,0	20	19,00	38,00	55,00	104	2,00	–	4
6522690	47N7200C7W		–	20,0	20	19,00	38,00	55,00	104	–	0,50	4
6522701	47N7200R7TE		–	20,0	20	19,00	38,00	55,00	104	0,50	–	4
6522702	47N7200R7TP		–	20,0	20	19,00	38,00	55,00	104	3,00	–	4
6522703	47N7200R7TR		–	20,0	20	19,00	38,00	55,00	104	5,00	–	4

VariMill I • Series 47N6 • Square End • Long Neck • 4 Flute • Metric





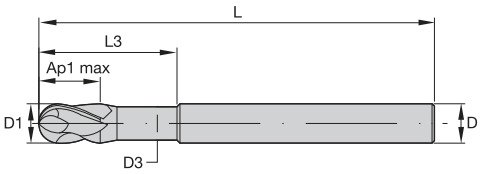


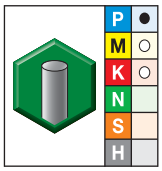
● first choice
○ alternate choice

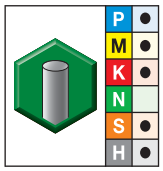
TiAlN-LW

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU
4067705	47N606002LW	6,0	6	5,50	12,00	42,00	100	0,40	4
4067706	47N608003LW	8,0	8	7,30	16,00	62,00	100	0,40	4
4067707	47N610004LW	10,0	10	9,10	20,00	60,00	100	0,50	4
4067708	47N612005LW	12,0	12	11,00	24,00	73,00	125	0,50	4
4067709	47N616006LW	16,0	16	14,56	32,00	100,00	150	0,50	4
4067710	47N620007LW	20,0	20	18,20	40,00	98,00	175	0,50	4

VariMill I • Series 47N0 • Ball Nose • Neck • 4 Flute • Metric







● first choice
○ alternate choice

WP15PE order #	WP15PE catalogue #	TiAlN-LT order #	TiAlN-LT catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	ZU
5576818	47N005002T	2605589	47N005002LT	5,0	6	4,70	9,00	15,00	57	4
5576819	47N006002T	2605590	47N006002LT	6,0	6	5,64	10,00	15,00	57	4
5576820	47N008003T	2605591	47N008003LT	8,0	8	7,52	12,00	20,00	63	4
5576821	47N010004T	2605592	47N010004LT	10,0	10	9,40	14,00	25,00	72	4
5576822	47N012005T	2605593	47N012005LT	12,0	12	11,28	16,00	30,00	83	4
5576823	47N016006T		—	16,0	16	15,04	22,00	38,00	92	4
5576824	47N020007T		—	20,0	20	18,80	26,00	50,00	104	4

VariMill I • Series 4777 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill I • Series 4717 • Application Data • TiAlN-LW • Metric

Material Group		Side Milling (A) Finishing A ap	A ae	TiAlN Cutting Speed — vc m/min min		max	Roughing A ap	A ae	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0
P	1	Ap1 max	0,05 x D*	300	–	400	Ap1 max	0,2 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,092	0,114
	2	Ap1 max	0,05 x D*	280	–	380	Ap1 max	0,2 x D	140	–	190	fz	0,044	0,060	0,072	0,083	0,092	0,114
	3	Ap1 max	0,05 x D*	240	–	320	Ap1 max	0,2 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,079	0,101
	4	Ap1 max	0,05 x D*	180	–	300	Ap1 max	0,2 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,070	0,088
	5	Ap1 max	0,05 x D*	120	–	200	Ap1 max	0,2 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,063	0,081
	6	Ap1 max	0,05 x D*	100	–	150	Ap1 max	0,2 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,052	0,065
M	1	Ap1 max	0,05 x D*	180	–	230	Ap1 max	0,2 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,101
	2	Ap1 max	0,05 x D*	120	–	160	Ap1 max	0,2 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,081
	3	Ap1 max	0,05 x D*	120	–	140	Ap1 max	0,2 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,065
K	1	Ap1 max	0,05 x D*	240	–	300	Ap1 max	0,2 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,092	0,114
	2	Ap1 max	0,05 x D*	220	–	260	Ap1 max	0,2 x D	110	–	130	fz	0,036	0,050	0,061	0,070	0,079	0,101
	3	Ap1 max	0,05 x D*	200	–	260	Ap1 max	0,2 x D	100	–	130	fz	0,029	0,040	0,048	0,056	0,063	0,081
S	1	Ap1 max	0,05 x D*	50	–	90	Ap1 max	0,2 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101
	2	Ap1 max	0,05 x D*	25	–	40	Ap1 max	0,2 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054
	3	Ap1 max	0,05 x D*	25	–	40	Ap1 max	0,2 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054
	4	Ap1 max	0,05 x D*	50	–	60	Ap1 max	0,2 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074
H	1	Ap1 max	0,05 x D*	160	–	280	Ap1 max	0,2 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,070	0,088

**For cutting data above, use ae ≤ 0,8mm.*
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.
For finishing, increase feed per tooth by 20%.

VariMill I • Series 4727 • Application Data • TiAlN-LW • Metric

Material Group		Side Milling (A)										Recommended feed per tooth (fz = mm/th) for side milling (A).			
		Finishing					Roughing								
		A		TiAlN Cutting Speed — vc m/min			A		TiAlN Cutting Speed — vc m/min				D1 — Diameter		
		ap	ae	min		max	ap	ae	min		max	mm	12,0	16,0	20,0
P	1	Ap1 max	0,05 x D*	300	–	400	Ap1 max	0,2 x D	150	–	200	fz	0,083	0,101	0,114
	2	Ap1 max	0,05 x D*	280	–	380	Ap1 max	0,2 x D	140	–	190	fz	0,083	0,101	0,114
	3	Ap1 max	0,05 x D*	240	–	320	Ap1 max	0,2 x D	120	–	160	fz	0,070	0,087	0,101
	4	Ap1 max	0,05 x D*	180	–	300	Ap1 max	0,2 x D	90	–	150	fz	0,062	0,077	0,088
	5	Ap1 max	0,05 x D*	120	–	200	Ap1 max	0,2 x D	60	–	100	fz	0,056	0,070	0,081
	6	Ap1 max	0,05 x D*	100	–	150	Ap1 max	0,2 x D	50	–	75	fz	0,047	0,057	0,065
M	1	Ap1 max	0,05 x D*	180	–	230	Ap1 max	0,2 x D	90	–	115	fz	0,070	0,087	0,101
	2	Ap1 max	0,05 x D*	120	–	160	Ap1 max	0,2 x D	60	–	80	fz	0,056	0,070	0,081
	3	Ap1 max	0,05 x D*	120	–	140	Ap1 max	0,2 x D	60	–	70	fz	0,047	0,057	0,065
K	1	Ap1 max	0,05 x D*	240	–	300	Ap1 max	0,2 x D	120	–	150	fz	0,083	0,101	0,114
	2	Ap1 max	0,05 x D*	220	–	260	Ap1 max	0,2 x D	110	–	130	fz	0,070	0,087	0,101
	3	Ap1 max	0,05 x D*	200	–	260	Ap1 max	0,2 x D	100	–	130	fz	0,056	0,070	0,081
S	1	Ap1 max	0,05 x D*	50	–	90	Ap1 max	0,2 x D	50	–	90	fz	0,070	0,087	0,101
	2	Ap1 max	0,05 x D*	25	–	40	Ap1 max	0,2 x D	25	–	40	fz	0,037	0,046	0,054
	3	Ap1 max	0,05 x D*	25	–	40	Ap1 max	0,2 x D	25	–	40	fz	0,037	0,046	0,054
	4	Ap1 max	0,05 x D*	50	–	60	Ap1 max	0,2 x D	50	–	60	fz	0,052	0,064	0,074
H	1	Ap1 max	0,05 x D*	160	–	280	Ap1 max	0,2 x D	80	–	140	fz	0,062	0,077	0,088

**For cutting data above, use ae ≤ 0,8mm.*

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.
For finishing, increase feed per tooth by 20%.

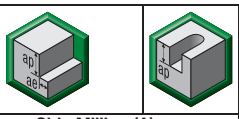
VariMill I • Series 4778 • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.								
		A		B	Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	ap	min		max	mm	4,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

HANITA

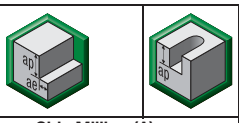
VariMill I • Series 47N7 • Application Data • WP15PE • Metric



Material Group		Side Milling (A) and Slotting (B)			WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.							
		A		B	Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	ap	min	–	max	mm	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

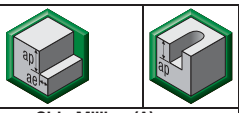
VariMill I • Series 47N7 • Application Data • TiAlN • Metric



Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.							
		A		B	Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	ap	min		max	mm	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

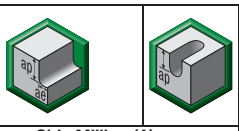
VariMill I • Series 47N6 • Application Data • TiAlN-LW • Metric

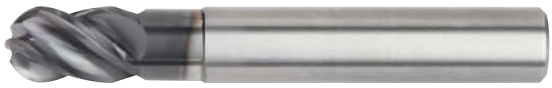


Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.						
		A		B	Cutting Speed — vc m/min				D1 — Diameter					
		ap	ae	ap	min		max	mm	6,0	8,0	10,0	12,0	16,0	20,0
P	0	1,5 x D	0,2 x D	0,5 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,101	0,114
	1	1,5 x D	0,2 x D	0,5 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,2 x D	0,5 x D	140	–	190	fz	0,044	0,060	0,072	0,083	0,101	0,114
	3	1,5 x D	0,2 x D	0,5 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,087	0,101
	4	1,5 x D	0,2 x D	0,5 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,077	0,088
	5	1,5 x D	0,2 x D	0,5 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,070	0,081
	6	1,5 x D	0,2 x D	0,5 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,057	0,065
M	1	1,5 x D	0,2 x D	0,5 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,2 x D	0,5 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081
	3	1,5 x D	0,2 x D	0,5 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,057	0,065
K	1	1,5 x D	0,2 x D	0,5 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,2 x D	0,5 x D	110	–	130	fz	0,036	0,050	0,061	0,070	0,087	0,101
	3	1,5 x D	0,2 x D	0,5 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,070	0,081
S	1	1,5 x D	0,2 x D	0,5 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,1 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054
	3	1,5 x D	0,2 x D	0,5 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054
	4	1,5 x D	0,2 x D	0,5 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074
H	1	1,5 x D	0,1 x D	0,3 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,077	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill I • Series 47N0 • Application Data • WP15PE/TiAlN-LT • Metric





Material Group		Side Milling (A) and Slotting (B)			WP15PE/TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B	Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	ap	min		max	mm	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,25 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,25 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,5 x D	1 x D	140	–	190	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,25 x D	0,5 x D	1 x D	120	–	160	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,25 x D	0,5 x D	0,75 x D	90	–	150	fz	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,25 x D	0,5 x D	1 x D	60	–	100	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1,25 x D	0,5 x D	0,75 x D	50	–	75	fz	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1,25 x D	0,5 x D	1 x D	90	–	115	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,5 x D	1 x D	60	–	80	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,25 x D	0,5 x D	1 x D	60	–	70	fz	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1,25 x D	0,5 x D	1 x D	120	–	150	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,5 x D	1 x D	110	–	140	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,25 x D	0,5 x D	1 x D	110	–	130	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1 x D	0,3 x D	0,3 x D	50	–	90	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,25 x D	0,5 x D	1 x D	25	–	40	fz	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	1,25 x D	0,5 x D	1 x D	50	–	60	fz	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1,25 x D	0,5 x D	0,75 x D	80	–	140	fz	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

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HANITA™

VariMill II™

High-Performance Solid End Milling

The VariMill II 5-flute solid carbide end mill family is a proven leader in high-performance milling, achieving supreme surface finishes in multiple materials through various milling operations, including full slotting up to a depth of cut of 1 x D.

Features and Benefits

Unequal flute spacing to cut harmonics and reduce the development of vibrations during cutting.

Center cutting for improved ramping capabilities and plunging.

38° helix angle to provide the best combination between a roughing and a finishing tool.

Unique core design to offer maximum room for chip evacuation while keeping the tool design stable.

VariMill II carbide end mills utilize a proprietary design driven by a unique relief style and unequal flute spacing.

STABLE

Unequal flute spacing design to ensure low vibrations and high cutting stability.

PRODUCTIVE

5 flute to increase feed-rate per revolution and exceed metal removal expectations.

VERSATILE

Maximum performance in multiple operations and the best choice to remove great volumes of chips in difficult-to-machine materials.

ADVANCED PRODUCTIVITY

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
WP15PE WS15PE	5

DIAMETER RANGE

METRIC
4–25mm

INDUSTRY

- GENERAL ENGINEERING
- AEROSPACE
- ENERGY
- TRANSPORTATION

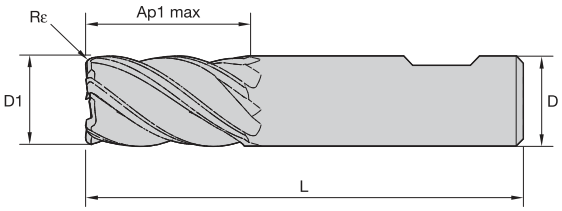
APPLICATIONS

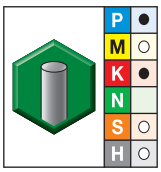
MATERIALS

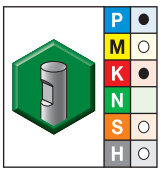
P M K S

- SIDE MILLING
- RAMPING
- HELICAL INTERPOLATION
- SLOTTING
- DYNAMIC MILLING
- PLUNGING

VariMill II • Series 5777 • Square End • Non-Center Cutting • 5 Flute • Metric



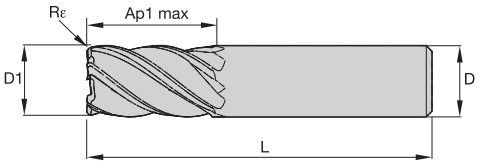


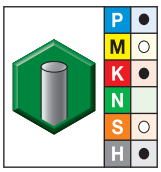


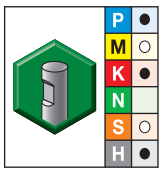
● first choice
○ alternate choice

WP15PE order #	WP15PE catalogue #	WP15PE order #	WP15PE catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
3524587	577704002MT		–	4,0	6	11,00	55	0,25	5
3524586	577704012MT		–	4,0	6	11,00	55	–	5
3524588	577705002MT		–	5,0	6	13,00	57	0,25	5
6525049	577706002ET		–	6,0	6	13,00	57	0,50	5
6525050	577706002JT		–	6,0	6	13,00	57	1,00	5
3524590	577706002MT		–	6,0	6	13,00	57	0,40	5
3524589	577706012MT		–	6,0	6	13,00	57	–	5
6525181	577708003JT		–	8,0	8	19,00	63	1,00	5
6525182	577708003KT		–	8,0	8	19,00	63	1,50	5
3524593	577708003MT		–	8,0	8	19,00	63	0,50	5
3524592	577708013MT		–	8,0	8	19,00	63	–	5
6525183	577710004JT		–	10,0	10	22,00	72	1,00	5
6525184	577710004KT		–	10,0	10	22,00	72	1,50	5
3524596	577710004MT		–	10,0	10	22,00	72	0,50	5
3524595	577710014MT		–	10,0	10	22,00	72	–	5
3524598	577712005MT		–	12,0	12	26,00	83	0,75	5
6525185	577712015ET		–	12,0	12	26,00	73	0,50	5
6525186	577712015JT		–	12,0	12	26,00	73	1,00	5
6525187	577712015KT		–	12,0	12	26,00	73	1,50	5
3524597	577712015MT		–	12,0	12	26,00	83	–	5
6525188	577712015NT		–	12,0	12	26,00	73	2,50	5
6525189	577716006JT		–	16,0	16	32,00	92	1,00	5
3524601	577716006MT	3524620	577716006MW	16,0	16	32,00	92	0,75	5
6525190	577716006PT		–	16,0	16	32,00	92	3,00	5
6525201	577716006QT		–	16,0	16	32,00	92	4,00	5
3524600	577716016MT		–	16,0	16	32,00	92	–	5
3524605	577720007MT		–	20,0	20	38,00	104	0,75	5
6525202	577720007PT		–	20,0	20	38,00	104	3,00	5
3524603	577720017MT		–	20,0	20	38,00	104	–	5
3524606	577725008MT		–	25,0	25	45,00	121	0,75	5
6525203	577725008RT		–	25,0	25	45,00	121	5,00	5

VariMill II • Series 577C • Square End • Center Cutting • 5 Flute • Metric



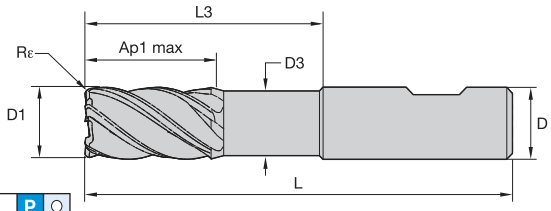


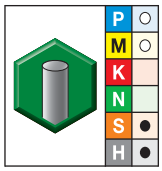


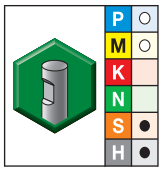
● first choice
○ alternate choice

WP15PE order #	WP15PE catalogue #	WP15PE order #	WP15PE catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
5578866	577C04002T	5578867	577C04002W	4,0	6	11,00	55	0,25	5
5578868	577C04012T		–	4,0	6	11,00	55	–	5
5578990	577C05002T	5578991	577C05002W	5,0	6	13,00	57	0,25	5
6519448	577C050R2TE		–	5,0	6	13,00	57	0,50	5
5578992	577C06002T	5578993	577C06002W	6,0	6	13,00	57	0,40	5
5578994	577C06012T		–	6,0	6	13,00	57	–	5
6519449	577C060R2TE		–	6,0	6	13,00	57	0,50	5
6519450	577C060R2TJ		–	6,0	6	13,00	57	1,00	5
5578995	577C07003T		–	7,0	8	16,00	63	0,40	5
5578997	577C08003T	5578998	577C08003W	8,0	8	19,00	63	0,50	5
5578999	577C08013T		–	8,0	8	19,00	63	–	5
6519481	577C080R3TJ		–	8,0	8	19,00	63	1,00	5
6519482	577C080R3TK		–	8,0	8	19,00	63	1,50	5
5579021	577C09004T		–	9,0	10	19,00	72	0,50	5
5579023	577C10004T	5579024	577C10004W	10,0	10	22,00	72	0,50	5
5579025	577C10014T		–	10,0	10	22,00	72	–	5
6519483	577C100R4TJ		–	10,0	10	22,00	72	1,00	5
6519484	577C100R4TK		–	10,0	10	22,00	72	1,50	5
6519485	577C100R4TM		–	10,0	10	22,00	72	2,00	5
5579026	577C12005T	5579027	577C12005W	12,0	12	26,00	83	0,75	5
5579028	577C12015T		–	12,0	12	26,00	83	–	5
6519486	577C120R5TE		–	12,0	12	26,00	83	0,50	5
6519487	577C120R5TJ		–	12,0	12	26,00	83	1,00	5
6519488	577C120R5TK		–	12,0	12	26,00	83	1,50	5
6519489	577C120R5TM		–	12,0	12	26,00	83	2,00	5
6519490	577C120R5TN		–	12,0	12	26,00	83	2,50	5
6519491	577C120R5TP		–	12,0	12	26,00	83	3,00	5
5579029	577C14004T	5579040	577C14004W	14,0	14	26,00	83	0,75	5
5579041	577C14014T		–	14,0	14	26,00	83	–	5
5579042	577C16006T	5579043	577C16006W	16,0	16	32,00	92	0,75	5
5579044	577C16016T		–	16,0	16	32,00	92	–	5
6519492	577C160R6TE		–	16,0	16	32,00	92	0,50	5
6519493	577C160R6TJ		–	16,0	16	32,00	92	1,00	5
6519497	577C160R6TM		–	16,0	16	32,00	92	2,00	5
6519499	577C160R6TP		–	16,0	16	32,00	92	3,00	5
6519500	577C160R6TQ		–	16,0	16	32,00	92	4,00	5
5579045	577C18008T		–	18,0	18	32,00	92	0,75	5
5579047	577C20007T	5579048	577C20007W	20,0	20	38,00	104	0,75	5
5579049	577C20017T		–	20,0	20	38,00	104	–	5
6519501	577C200R7TJ		–	20,0	20	38,00	104	1,00	5
6519502	577C200R7TM		–	20,0	20	38,00	104	2,00	5
6519503	577C200R7TP		–	20,0	20	38,00	104	3,00	5
6519504	577C200R7TQ		–	20,0	20	38,00	104	4,00	5
6519505	577C200R7TR		–	20,0	20	38,00	104	5,00	5
5579060	577C25008T	5579061	577C25008W	25,0	25	45,00	121	0,75	5
6519506	577C250R8TM		–	25,0	25	45,00	121	2,00	5
6519507	577C250R8TP		–	25,0	25	45,00	121	3,00	5
6519508	577C250R8TQ		–	25,0	25	45,00	121	4,00	5
6519509	577C250R8TR		–	25,0	25	45,00	121	5,00	5

VariMill II • Series 57N8 • Square End • Non-Center Cutting • Neck • 5 Flute • Metric



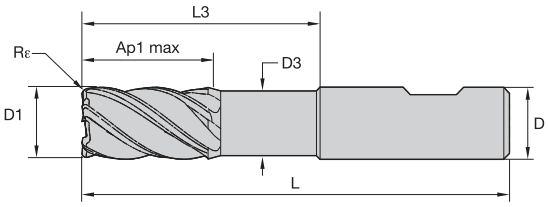


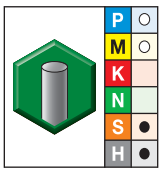


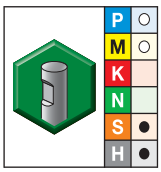
● first choice
○ alternate choice

WS15PE		WS15PE									
order #	catalogue #	order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
3524626	57N806002MT		–	6,0	6	5,60	13,00	18,00	63	–	5
3524627	57N806022MT		–	6,0	6	5,60	13,00	18,00	63	0,50	5
6492821	57N8060R2MTG		–	6,0	6	5,64	13,00	18,00	63	0,75	5
3524629	57N808003MT		–	8,0	8	7,50	19,00	24,00	76	–	5
3524631	57N808023MT		–	8,0	8	7,50	19,00	24,00	76	0,50	5
6492822	57N8080R3MTG		–	8,0	8	7,52	19,00	24,00	76	0,75	5
6492825	57N8080R3MTK		–	8,0	8	7,52	19,00	24,00	76	1,50	5
3524632	57N810004MT		–	10,0	10	9,40	22,00	30,00	76	–	5
3524643	57N810024MT		–	10,0	10	9,40	22,00	30,00	76	0,50	5
3524644	57N810034MT		–	10,0	10	9,40	22,00	30,00	76	1,00	5
3524645	57N810054MT		–	10,0	10	9,40	22,00	30,00	76	2,00	5
6492823	57N8100R4MTG		–	10,0	10	9,40	22,00	30,00	76	0,75	5
6492826	57N8100R4MTK		–	10,0	10	9,40	22,00	30,00	76	1,50	5
3524647	57N812025MT		–	12,0	12	11,28	26,00	36,00	83	0,50	5
3524648	57N812035MT		–	12,0	12	11,28	26,00	36,00	83	1,00	5
3524649	57N812055MT		–	12,0	12	11,28	26,00	36,00	83	2,00	5
6492827	57N8120R5MTK		–	12,0	12	11,28	26,00	36,00	83	1,50	5
6492829	57N8120R5MTN		–	12,0	12	11,28	26,00	36,00	83	2,50	5
6492830	57N8120R5MTP		–	12,0	12	11,28	26,00	36,00	83	3,00	5
3524650	57N816006MT		–	16,0	16	15,05	32,00	48,00	100	–	5
3524651	57N816026MT	3562867	57N816026MW	16,0	16	15,05	32,00	48,00	100	0,50	5
3524652	57N816036MT		–	16,0	16	15,05	32,00	48,00	100	1,00	5
3524654	57N816076MT	3524692	57N816076MW	16,0	16	15,05	32,00	48,00	100	3,00	5
6492832	57N8160R6MTQ		–	16,0	16	15,04	32,00	48,00	100	4,00	5
	–	3524693	57N820027MW	20,0	20	18,80	38,00	60,00	115	0,50	5
6492824	57N8200R7MTJ		–	20,0	20	18,80	38,00	60,00	115	1,00	5
6492833	57N8200R7MTR		–	20,0	20	18,80	38,00	60,00	115	5,00	5
6492831	57N8250R8MTP		–	25,0	25	23,50	45,00	75,00	135	3,00	5
6492834	57N8250R8MTR		–	25,0	25	23,50	45,00	75,00	135	5,00	5

VariMill II • Series 57NC • Square End • Center Cutting • Neck • 5 Flute • Metric



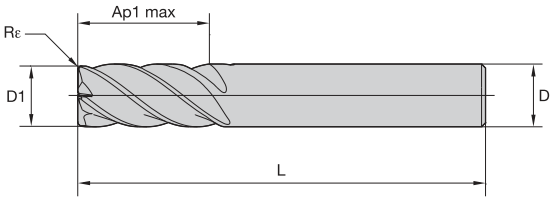


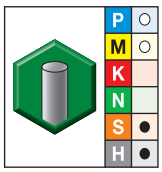


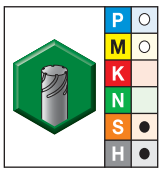
● first choice
○ alternate choice

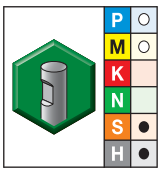
WS15PE		WS15PE									
order #	catalogue #	order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
5598906	57NC06002T		–	6,0	6	5,64	13,00	18,00	63	–	5
5598907	57NC06022T		–	6,0	6	5,64	13,00	18,00	63	0,50	5
5598909	57NC06032T		–	6,0	6	5,64	13,00	18,00	63	1,00	5
	–	5599071	57NC06042W	6,0	6	5,64	13,00	18,00	63	1,50	5
6569491	57NC060R2TK		–	6,0	6	5,64	13,00	17,82	63	1,50	5
5599072	57NC08003T		–	8,0	8	7,52	19,00	24,00	76	–	5
5599073	57NC08023T	5599074	57NC08023W	8,0	8	7,52	19,00	24,00	76	0,50	5
5599075	57NC08033T	5599076	57NC08033W	8,0	8	7,52	19,00	24,00	76	1,00	5
6569493	57NC080R3TM	5599077	57NC08053W	8,0	8	7,52	19,00	24,00	76	2,00	5
6569492	57NC080R3TK		–	8,0	8	7,52	19,00	24,00	76	1,50	5
5599078	57NC10004T		–	10,0	10	9,40	22,00	30,00	76	–	5
5599079	57NC10024T	5599080	57NC10024W	10,0	10	9,40	22,00	30,00	76	0,50	5
5599081	57NC10034T	5599082	57NC10034W	10,0	10	9,40	22,00	30,00	76	1,00	5
5599083	57NC10054T		–	10,0	10	9,40	22,00	30,00	76	2,00	5
6569494	57NC100R4TK		–	10,0	10	9,40	22,00	30,00	76	1,50	5
5599085	57NC12005T		–	12,0	12	11,28	26,00	36,00	83	–	5
5599086	57NC12025T	5599087	57NC12025W	12,0	12	11,28	26,00	36,00	83	0,50	5
5599088	57NC12035T		–	12,0	12	11,28	26,00	36,00	83	1,00	5
5599090	57NC12055T	5599091	57NC12055W	12,0	12	11,28	26,00	36,00	83	2,00	5
6569495	57NC120R5TK		–	12,0	12	11,28	26,00	36,00	83	1,50	5
6569496	57NC120R5TP		–	12,0	12	11,28	26,00	36,00	83	3,00	5
5599092	57NC16006T		–	16,0	16	15,04	32,00	48,00	100	–	5
5599093	57NC16026T	5598905	57NC16026W	16,0	16	15,04	32,00	48,00	100	0,50	5
5599094	57NC16036T	5599095	57NC16036W	16,0	16	15,04	32,00	48,00	100	1,00	5
5599096	57NC16056T		–	16,0	16	15,04	32,00	48,00	100	2,00	5
5599098	57NC16076T	5599099	57NC16076W	16,0	16	15,04	32,00	48,00	100	3,00	5
6569497	57NC160R6TQ		–	16,0	16	15,04	32,00	48,00	100	4,00	5
5599100	57NC20007T		–	20,0	20	18,80	38,00	60,00	115	–	5
5599101	57NC20027T	5599102	57NC20027W	20,0	20	18,80	38,00	60,00	115	0,50	5
5599103	57NC20037T	5599104	57NC20037W	20,0	20	18,80	38,00	60,00	115	1,00	5
5599105	57NC20057T		–	20,0	20	18,80	38,00	60,00	115	2,00	5
5599107	57NC20077T	5599108	57NC20077W	20,0	20	18,80	38,00	60,00	115	3,00	5
5599109	57NC20087T		–	20,0	20	18,80	38,00	60,00	115	4,00	5
6569498	57NC200R7TR		–	20,0	20	18,80	38,00	60,00	115	5,00	5
5599111	57NC25008T		–	25,0	25	23,50	45,00	75,00	135	–	5
5599112	57NC25028T		–	25,0	25	23,50	45,00	75,00	135	0,50	5
5599114	57NC25038T	5599115	57NC25038W	25,0	25	23,50	45,00	75,00	135	1,00	5
5599116	57NC25058T		–	25,0	25	23,50	45,00	75,00	135	2,00	5
5599118	57NC25078T		–	25,0	25	23,50	45,00	75,00	135	3,00	5
5599120	57NC25088T		–	25,0	25	23,50	45,00	75,00	135	4,00	5

VariMill II ER • Series 577E • Square End • Eccentric Relief • 5 Flute • Metric





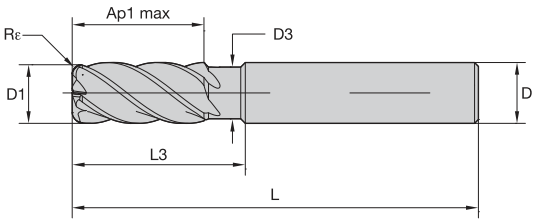


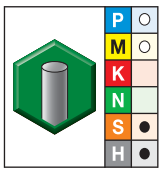


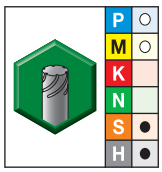
● first choice
○ alternate choice

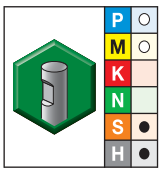
WS15PE		WS15PE		WS15PE							
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
5599171	577E10004T		–		–	10,0	10	22,00	72	—	5
	–		–	5599176	577E12015W	12,0	12	26,00	83	0,75	5
	–	5599177	577E16006V		–	16,0	16	32,00	92	—	5
	–	5599178	577E16016V	5599179	577E16016W	16,0	16	32,00	92	0,75	5
	–	5599180	577E20007V		–	20,0	20	38,00	104	—	5
	–	5599181	577E20017V	5599182	577E20017W	20,0	20	38,00	104	0,75	5
	–	5599183	577E25018V		–	25,0	25	45,00	121	0,75	5

VariMill II ER • Series 57NE • Square End • Eccentric Relief • Neck • 5 Flute • Metric





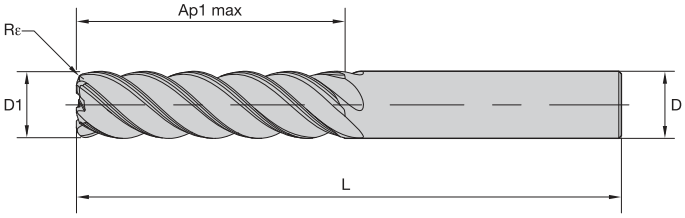


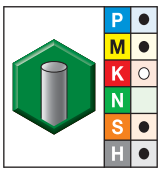


● first choice
○ alternate choice

WS15PE		WS15PE		WS15PE									
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
5599122	57NE10004T		–		–	10,0	10	9,40	22,00	30,00	76	–	5
5599123	57NE10024T		–	5599124	57NE10024W	10,0	10	9,40	22,00	30,00	76	0,50	5
5599125	57NE10034T		–	5599126	57NE10034W	10,0	10	9,40	22,00	30,00	76	1,00	5
5599127	57NE10054T		–	5599128	57NE10054W	10,0	10	9,40	22,00	30,00	76	2,00	5
	–	5599129	57NE12005V		–	12,0	12	11,28	26,00	36,00	83	–	5
	–	5599130	57NE12025V	5599131	57NE12025W	12,0	12	11,28	26,00	36,00	83	0,50	5
	–	5599132	57NE12035V	5599133	57NE12035W	12,0	12	11,28	26,00	36,00	83	1,00	5
	–	5599134	57NE12055V	5599135	57NE12055W	12,0	12	11,28	26,00	36,00	83	2,00	5
	–	5599136	57NE16006V		–	16,0	16	15,04	32,00	48,00	100	–	5
	–	5599137	57NE16026V	5599138	57NE16026W	16,0	16	15,04	32,00	48,00	100	0,50	5
	–	5599139	57NE16036V	5599140	57NE16036W	16,0	16	15,04	32,00	48,00	100	1,00	5
	–	5599141	57NE16056V	5599142	57NE16056W	16,0	16	15,04	32,00	48,00	100	2,00	5
	–	5599143	57NE20007V		–	20,0	20	18,80	38,00	60,00	115	–	5
	–	5599144	57NE20027V	5599145	57NE20027W	20,0	20	18,80	38,00	60,00	115	0,50	5
	–	5599146	57NE20037V	5599147	57NE20037W	20,0	20	18,80	38,00	60,00	115	1,00	5
	–	5599148	57NE20057V	5599149	57NE20057W	20,0	20	18,80	38,00	60,00	115	2,00	5
	–	5599160	57NE20087V	5599161	57NE20087W	20,0	20	18,80	38,00	60,00	115	4,00	5
	–	5599162	57NE25008V		–	25,0	25	23,50	45,00	75,00	135	–	5
	–	5599163	57NE25028V		–	25,0	25	23,50	45,00	75,00	135	0,50	5
	–	5599165	57NE25038V		–	25,0	25	23,50	45,00	75,00	135	1,00	5
	–	5599167	57NE25058V		–	25,0	25	23,50	45,00	75,00	135	2,00	5
	–	5599169	57NE25088V		–	25,0	25	23,50	45,00	75,00	135	4,00	5

VariMill II Long • Series 5718 • Square End • Long Length • 5 Flute • Metric





● first choice
○ alternate choice

AlTiN-MT

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	Z U
5096566	571806002MT	6,0	6	24,00	76	–	5
5096567	571806012MT	6,0	6	24,00	76	0,50	5
5096568	571806022MT	6,0	6	24,00	76	1,00	5
5096569	571808003MT	8,0	8	32,00	76	–	5
5096660	571808013MT	8,0	8	32,00	76	0,50	5
5096661	571808023MT	8,0	8	32,00	76	1,00	5
4124297	571810004MT	10,0	10	40,00	100	–	5
5096662	571810014MT	10,0	10	40,00	100	0,50	5
5096664	571810034MT	10,0	10	40,00	100	2,00	5
5096665	571810044MT	10,0	10	40,00	100	2,50	5
4124298	571812005MT	12,0	12	48,00	125	–	5
5096666	571812015MT	12,0	12	48,00	125	0,50	5
5096667	571812025MT	12,0	12	48,00	125	1,00	5
5096668	571812035MT	12,0	12	48,00	125	2,00	5
5096669	571812045MT	12,0	12	48,00	125	2,50	5
4124299	571814014MT	14,0	14	56,00	120	–	5
5096752	571814024MT	14,0	14	56,00	120	1,00	5
5096755	571814054MT	14,0	14	56,00	120	4,00	5
4124300	571816006MT	16,0	16	64,00	141	–	5
5096756	571816016MT	16,0	16	64,00	141	0,50	5
5096757	571816026MT	16,0	16	64,00	141	1,00	5
5096758	571816036MT	16,0	16	64,00	141	2,00	5
5096759	571816046MT	16,0	16	64,00	141	3,00	5
5096800	571816056MT	16,0	16	64,00	141	4,00	5
4124301	571818018MT	18,0	18	72,00	150	–	5
4124302	571820007MT	20,0	20	80,00	150	–	5
5096805	571820017MT	20,0	20	80,00	150	0,50	5
5096806	571820027MT	20,0	20	80,00	150	1,00	5
5096807	571820037MT	20,0	20	80,00	150	2,00	5
5096808	571820047MT	20,0	20	80,00	150	3,00	5
5096809	571820057MT	20,0	20	80,00	150	4,00	5
4124323	571825008MT	25,0	25	100,00	170	–	5
5096860	571825018MT	25,0	25	100,00	170	0,50	5
5096861	571825028MT	25,0	25	100,00	170	1,00	5
5096862	571825038MT	25,0	25	100,00	170	2,00	5
5096863	571825048MT	25,0	25	100,00	170	3,00	5

VariMill II • Series 5777 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 4,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on > 12mm diameters.

VariMill II • Series 577C • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill II • Series 57N8 • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,036	0,050	0,061	0,007	0,087	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm diameters.

VariMill II • Series 57NC • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill II ER • Series 577E • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.							
		A		B	Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	ap	min		max	mm	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill II ER • Series 57NE • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.							
		A		B	Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	ap	min		max	mm	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill II Long • Series 5718 • Application Data • AlTiN-MT • Metric

Material Group		Side Milling (A)		AlTiN			Recommended feed per tooth (fz = mm/th) for side milling (A).									
		A		Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	min		max	mm	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	Ap1 max	0,05 x D*	300	–	400	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	1	Ap1 max	0,05 x D*	300	–	400	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	2	Ap1 max	0,05 x D*	280	–	380	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	3	Ap1 max	0,05 x D*	240	–	320	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	4	Ap1 max	0,05 x D*	180	–	300	fz	0,039	0,054	0,065	0,075	0,084	0,092	0,099	0,106	0,117
	5	Ap1 max	0,05 x D*	120	–	200	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
	6	Ap1 max	0,05 x D*	100	–	150	fz	0,030	0,040	0,048	0,056	0,062	0,068	0,073	0,078	0,085
M	1	Ap1 max	0,05 x D*	180	–	230	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	2	Ap1 max	0,05 x D*	120	–	160	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
	3	Ap1 max	0,05 x D*	120	–	140	fz	0,030	0,040	0,048	0,056	0,062	0,068	0,073	0,078	0,085
K	1	Ap1 max	0,05 x D*	240	–	300	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	2	Ap1 max	0,05 x D*	220	–	280	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	3	Ap1 max	0,05 x D*	220	–	260	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
S	1	Ap1 max	0,05 x D*	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	Ap1 max	0,05 x D*	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	Ap1 max	0,05 x D*	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	Ap1 max	0,05 x D*	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	Ap1 max	0,05 x D*	160	–	280	fz	0,039	0,054	0,065	0,075	0,084	0,092	0,099	0,106	0,117
	2	Ap1 max	0,06 x D*	140	–	240	fz	0,030	0,040	0,048	0,056	0,062	0,068	0,073	0,078	0,085

** For the above cutting data, do not exceed an overall ae of 0,8mm.*

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machinining centers, please adjust parameters accordingly on >0,5mm diameters.

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VariMill III™ ER

High-Performance Solid End Milling

VariMill III ER is a 7-flute solid carbide end mill engineered to provide the highest metal removal rates in difficult-to-machine workpiece materials, providing extended tool life in semi-finishing, finishing, and dynamic milling operations.

Features and Benefits

7 unequally spaced flutes: one tool for roughing and finishing.

Center cutting: better floor finish and added flexibility.

Eccentric relief: increases edge strength - higher feed rates.

Safe-Lock: eliminates end mill pull-out with no run-out.

VariMill III ER features 7 unequally spaced flutes and a Safe-Lock™ function to allow the tool to be used in roughing and finishing operations without end mill pull-out.

FAST

The 7-flute geometry ensures highest feed-rates in side milling operations.

DYNAMIC

The flute and core design enables high performance and productivity in high-speed and dynamic milling applications.

SPECIFIC

VariMill III ER is particularly engineered to tackle all milling applications on difficult-to-cut materials such as heat-resistant superalloys and stainless steels.

DYNAMICALLY PRODUCTIVE

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
WS15PE	7

DIAMETER RANGE

METRIC
10–20mm

INDUSTRY

GENERAL ENGINEERING

ENERGY

AEROSPACE

APPLICATIONS

MATERIALS

P M S

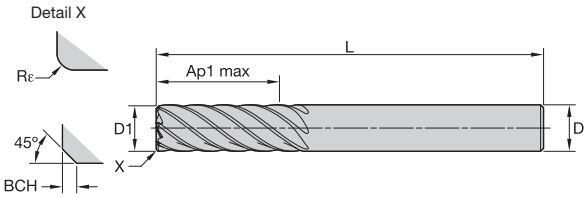
SIDE MILLING

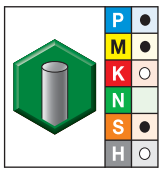
DYNAMIC MILLING

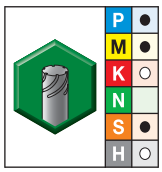
HELICAL INTERPOLATION

RAMPING

VariMill III ER • Series 771E 772E • Square End • 7 Flute • Metric



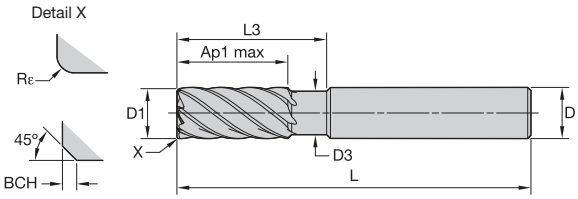


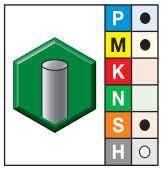


● first choice
○ alternate choice

WS15PE		WS15PE								
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	BCH	Z U
5978092	771E10004T		–	10,0	10	30,00	76	–	0,50	7
5978093	771E10024T		–	10,0	10	30,00	76	0,50	–	7
5978094	772E10004T		–	10,0	10	50,00	100	–	0,50	7
5978095	772E10024T		–	10,0	10	50,00	100	0,50	–	7
5978098	771E12005T		–	12,0	12	36,00	100	–	0,50	7
5978099	771E12025T		–	12,0	12	36,00	100	0,50	–	7
5978100	772E12005T	5978102	772E12005V	12,0	12	60,00	125	–	0,50	7
5978101	772E12025T	5978103	772E12025V	12,0	12	60,00	125	0,50	–	7
5978106	771E16006T		–	16,0	16	48,00	110	–	0,50	7
5978107	771E16026T		–	16,0	16	48,00	110	0,50	–	7
5978108	772E16006T	5978110	772E16006V	16,0	16	80,00	141	–	0,50	7
5978109	772E16026T	5978111	772E16026V	16,0	16	80,00	141	0,50	–	7
5978114	771E20007T		–	20,0	20	60,00	125	–	0,50	7
5978115	771E20027T		–	20,0	20	60,00	125	0,50	–	7
5978116	772E20007T	5978118	772E20007V	20,0	20	100,00	166	–	0,50	7
5978117	772E20027T	5978119	772E20027V	20,0	20	100,00	166	0,50	–	7

VariMill III ER • Series 77NE • Square End • Neck • 7 Flute • Metric





● first choice
○ alternate choice

WS15PE										
order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	BCH	Z U
5978039	77NE10004T	10,0	10	9,40	22,00	30,00	76	–	0,50	7
5978040	77NE10024T	10,0	10	9,40	22,00	30,00	76	0,50	–	7
5978096	77NE12005T	12,0	12	11,28	26,00	36,00	83	–	0,50	7
5978097	77NE12025T	12,0	12	11,28	26,00	36,00	83	0,50	–	7
5978104	77NE16006T	16,0	16	15,04	32,00	48,00	100	–	0,50	7
5978105	77NE16026T	16,0	16	15,04	32,00	48,00	100	0,50	–	7
5978112	77NE20007T	20,0	20	18,80	38,00	60,00	115	–	0,50	7
5978113	77NE20027T	20,0	20	18,80	38,00	60,00	115	0,50	–	7

VariMill III ER • Series 771E • Finishing • Application Data • WS15PE • Metric

Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).							
		A		Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	min		max	mm	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	4	Ap1 max	0,1 x D	90	-	150	fz	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	Ap1 max	0,1 x D	60	-	100	fz	0,048	0,056	0,063	0,070	0,076	0,081	0,091
M	1	Ap1 max	0,1 x D	90	-	115	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	Ap1 max	0,1 x D	60	-	80	fz	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	Ap1 max	0,1 x D	60	-	70	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	Ap1 max	0,1 x D	50	-	90	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	Ap1 max	0,1 x D	25	-	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	Ap1 max	0,1 x D	25	-	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	Ap1 max	0,1 x D	50	-	60	fz	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	Ap1 max	0,1 x D	80	-	140	fz	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	Ap1 max	0,1 x D	70	-	120	fz	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill III ER • Series 771E • Semi-Finishing • Application Data • WS15PE • Metric

Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).							
		A		Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	min		max	mm	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	4	Ap1 max	0,06 x D	180	-	300	fz	0,065	0,075	0,084	0,092	0,099	0,106	0,117
	5	Ap1 max	0,06 x D	120	-	200	fz	0,058	0,067	0,076	0,084	0,091	0,097	0,109
M	1	Ap1 max	0,06 x D	180	-	230	fz	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	2	Ap1 max	0,06 x D	120	-	160	fz	0,058	0,067	0,076	0,084	0,091	0,097	0,109
	3	Ap1 max	0,06 x D	120	-	140	fz	0,048	0,056	0,062	0,068	0,073	0,078	0,085
S	1	Ap1 max	0,06 x D	50	-	90	fz	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	Ap1 max	0,06 x D	25	-	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	Ap1 max	0,06 x D	25	-	40	fz	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	Ap1 max	0,06 x D	50	-	60	fz	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	Ap1 max	0,06 x D	160	-	280	fz	0,065	0,075	0,084	0,092	0,099	0,106	0,117
	2	Ap1 max	0,06 x D	140	-	240	fz	0,048	0,056	0,062	0,068	0,073	0,078	0,085

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill III ER • Series 772E • Application Data • WS15PE • Metric

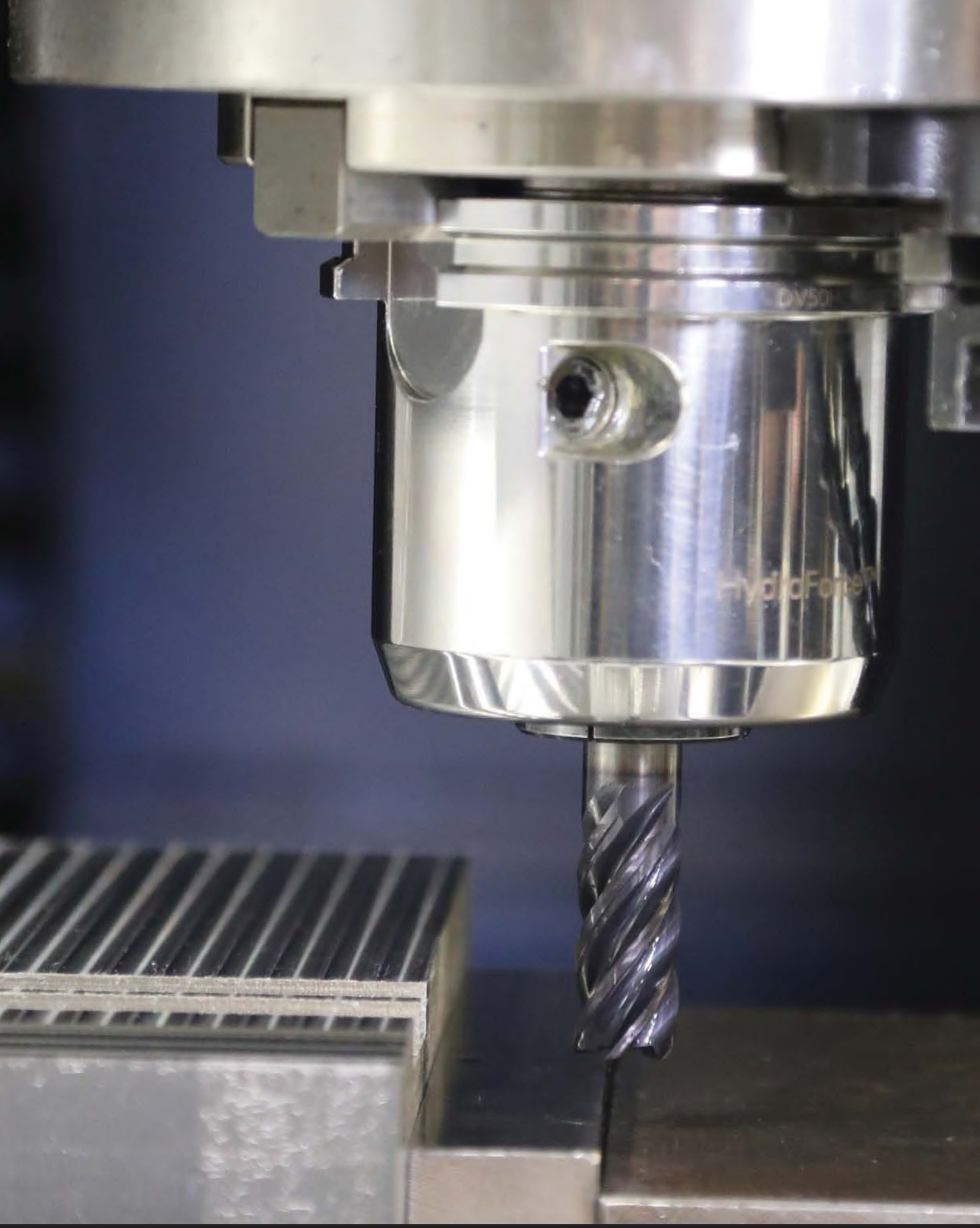
Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).						
		A		Cutting Speed — vc m/min				D1 — Diameter					
		ap	ae	min		max	mm	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,05 x D	300	–	400	fz	0,086	0,099	0,111	0,121	0,130	0,137
	1	Ap1 max	0,05 x D	300	–	400	fz	0,086	0,099	0,111	0,121	0,130	0,137
	2	Ap1 max	0,05 x D	280	–	380	fz	0,086	0,099	0,111	0,121	0,130	0,137
	3	Ap1 max	0,05 x D	240	–	320	fz	0,073	0,084	0,095	0,105	0,113	0,121
	4	Ap1 max	0,05 x D	180	–	300	fz	0,065	0,075	0,084	0,092	0,099	0,106
	5	Ap1 max	0,05 x D	120	–	200	fz	0,058	0,067	0,076	0,084	0,091	0,097
	6	Ap1 max	0,05 x D	100	–	150	fz	0,048	0,056	0,062	0,068	0,073	0,078
M	1	Ap1 max	0,05 x D	180	–	230	fz	0,073	0,084	0,095	0,105	0,113	0,121
	2	Ap1 max	0,05 x D	120	–	160	fz	0,058	0,067	0,076	0,084	0,091	0,097
	3	Ap1 max	0,05 x D	120	–	140	fz	0,048	0,056	0,062	0,068	0,073	0,078
K	1	Ap1 max	0,05 x D	240	–	300	fz	0,086	0,099	0,111	0,121	0,130	0,137
	2	Ap1 max	0,05 x D	220	–	280	fz	0,073	0,084	0,095	0,105	0,113	0,121
	3	Ap1 max	0,05 x D	220	–	260	fz	0,058	0,067	0,076	0,084	0,091	0,097
S	1	Ap1 max	0,05 x D	50	–	90	fz	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,05 x D	25	–	40	fz	0,032	0,037	0,042	0,046	0,050	0,054
	3	Ap1 max	0,05 x D	25	–	40	fz	0,032	0,037	0,042	0,046	0,050	0,054
	4	Ap1 max	0,05 x D	50	–	60	fz	0,045	0,052	0,058	0,064	0,069	0,074
H	1	Ap1 max	0,05 x D	160	–	280	fz	0,065	0,075	0,084	0,092	0,099	0,106
	2	Ap1 max	0,06 x D	140	–	240	fz	0,048	0,056	0,062	0,068	0,073	0,078

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

VariMill III ER • Series 77NE • Application Data • WS15PE • Metric

Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).						
		A		Cutting Speed — vc m/min				D1 — Diameter					
		ap	ae	min		max	mm	10,0	12,0	14,0	16,0	18,0	20,0
P	4	1 x D	0,15 x D	90	-	150	fz	0,054	0,062	0,070	0,077	0,083	0,088
	5	1 x D	0,15 x D	60	-	100	fz	0,048	0,056	0,063	0,070	0,076	0,081
M	1	1 x D	0,15 x D	90	-	115	fz	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,15 x D	60	-	80	fz	0,048	0,056	0,063	0,070	0,076	0,081
	3	1 x D	0,15 x D	60	-	70	fz	0,040	0,047	0,052	0,057	0,061	0,065
S	1	1 x D	0,15 x D	50	-	90	fz	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,15 x D	25	-	40	fz	0,032	0,037	0,042	0,046	0,050	0,054
	3	1 x D	0,15 x D	25	-	40	fz	0,032	0,037	0,042	0,046	0,050	0,054
	4	1 x D	0,15 x D	50	-	60	fz	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1 x D	0,15 x D	80	-	140	fz	0,054	0,062	0,070	0,077	0,083	0,088
	2	1 x D	0,15 x D	70	-	120	fz	0,040	0,047	0,052	0,057	0,061	0,065

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.



widia.com

HANITA™

Roughers

High-Performance Solid End Milling

The High-Performance Roughers group of products includes numerous end mills with chip breaker profiles to operate on multiple materials and in multiple end markets, providing effective chip control to reduce the spindle power and efficiently machine components when a high quantity of material needs to be removed. This group is designed with chip breaker profiles to operate on low-power machines or when the cutting conditions are not stable.

Features and Benefits

Chipbreaker profiles generate small and easy-to-evacuate chips.

Center cut for improved plunging and ramping applications.

Different helix angles to ensure the best performance and cutting actions on different materials categories.

The chip breaker profile on Rougher end mills helps reduce cutting forces and temperature increases, allowing the tool to perform operations longer. With different available shapes, the roughing profiles ensure the formation of small chips which are easier to evacuate from the cutting area on different workpiece materials.

SMOOTH

The chipbreaker profile helps to reduce cutting forces and the generation of high temperatures.

EASY

Small chips are easy to evacuate from the cutting area, increasing productivity and reducing machine downtime.

FIRM

The Roughers' end mills are the perfect tool when full slotting operations are the daily job.

ROUGHING BEYOND THE LIMITS

PRODUCT

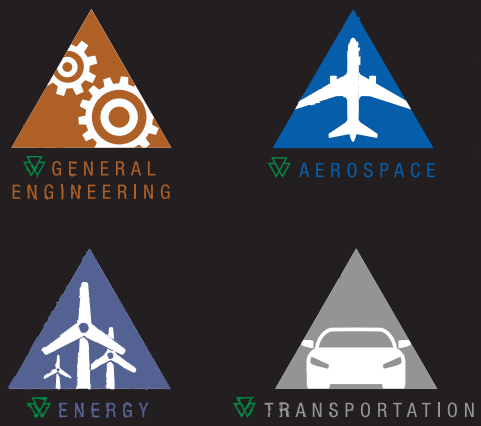
SOLID CARBIDE END MILL

GRADE	FLUTE
WP15PE WS15PE TiAlN	3–6

DIAMETER RANGE

METRIC
3–25mm

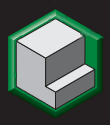
INDUSTRY



APPLICATIONS

MATERIALS

P M K S H


SIDE MILLING

RAMPING

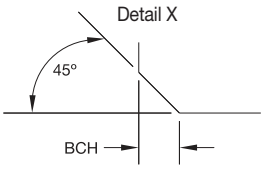
HELICAL INTERPOLATION

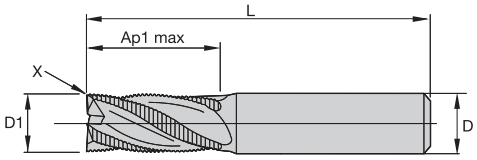
SLOTTING

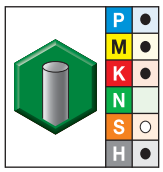
DYNAMIC MILLING

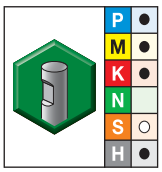
PLUNGING

Roughers • Series 4906 • Chamfer • Metric





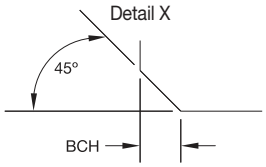


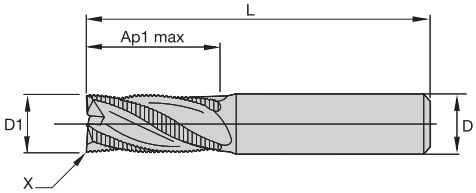


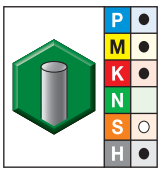
● first choice
○ alternate choice

WP15PE		WP15PE							
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
1657001	490604002RT	1657002	490604002RW	4,0	6	11,00	55	0,30	3
1657009	490605002RT	1657010	490605002RW	5,0	6	13,00	57	0,30	3
1657018	490606002RT	1657019	490606002RW	6,0	6	13,00	57	0,30	3
3133084	490607003RT	1657025	490607003RW	7,0	8	16,00	63	0,30	3
1657033	490608003RT	1657034	490608003RW	8,0	8	16,00	63	0,30	3
1657050	490610004RT	1657051	490610004RW	10,0	10	22,00	72	0,50	4
3133086	490611005RT		–	11,0	12	26,00	83	0,50	4
1657063	490612005RT	1657064	490612005RW	12,0	12	26,00	83	0,50	4
	–	1657085	490614014RW	14,0	14	26,00	83	0,50	4
1657096	490616006RT	1657097	490616006RW	16,0	16	32,00	92	0,50	4
1657112	490620007RT	1657113	490620007RW	20,0	20	38,00	104	0,50	4
	–	1657121	490625008RW	25,0	25	45,00	121	0,50	5

Roughers • Series 4976 • Chamfer • Metric





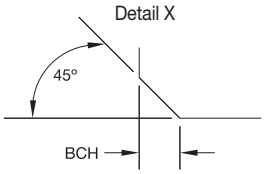


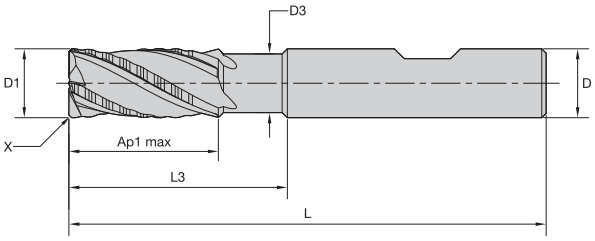
● first choice
○ alternate choice

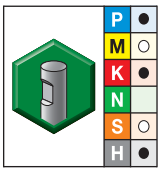
WP15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
5560708	497604002T	4,0	6	8,00	57	0,30	3
5560709	497605002T	5,0	6	13,00	57	0,30	3
5560710	497606002T	6,0	6	13,00	57	0,30	3
5560711	497608003T	8,0	8	16,00	63	0,30	3
5560712	497610004T	10,0	10	22,00	72	0,50	4
5560713	497612005T	12,0	12	26,00	83	0,50	4
5560714	497614014T	14,0	14	26,00	83	0,50	4
5560715	497616006T	16,0	16	32,00	92	0,50	4
5560717	497620007T	20,0	20	38,00	104	0,50	4

Roughers • Series 49N6 • Chamfer • Neck • Metric





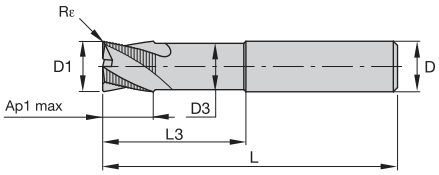


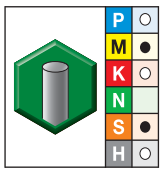
● first choice
○ alternate choice

WP15PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU
3474585	49N606002MW	6,0	6	5,50	13,00	21,00	57	0,30	3
3474587	49N608003MW	8,0	8	7,50	16,00	27,00	63	0,30	3
3474589	49N610004MW	10,0	10	9,50	22,00	32,00	72	0,50	4
3474591	49N612005MW	12,0	12	11,00	26,00	38,00	83	0,50	4
3474594	49N616006MW	16,0	16	15,00	32,00	44,00	92	0,50	4
3474597	49N625008MW	25,0	25	24,00	45,00	65,00	121	0,50	5

Roughers • Series 4U50 • Radius • Metric

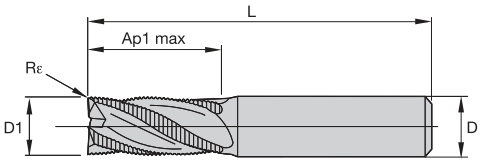


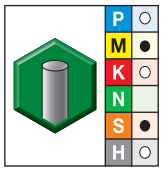


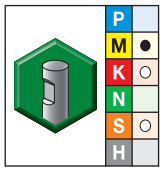
● first choice
○ alternate choice

WS15PE									
order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
6431403	4U50M060R2TC	6,0	6	5,64	6,00	18,00	57	0,30	4
6431404	4U50M080R3TC	8,0	8	7,52	8,00	24,00	63	0,30	4
6431405	4U50M100R4TE	10,0	10	9,40	10,00	30,00	72	0,50	4
6431406	4U50M120R5TE	12,0	12	11,28	12,00	36,00	83	0,50	4
6431407	4U50M160R6TE	16,0	16	15,04	16,00	48,00	92	0,50	6
6431408	4U50M200R7TG	20,0	20	18,80	20,00	60,00	104	1,00	6
6431409	4U50M250R8TG	25,0	25	23,50	25,00	75,00	121	1,00	6

Roughers • Series 4U80 • Radius • Metric



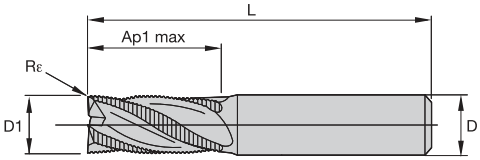


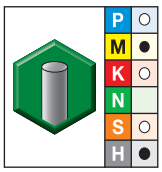


● first choice
○ alternate choice

WS15PE		AlTiN-MW							
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
6431246	4U80M060R2TC	6652714	4U80M060R2WC	6,0	6	13,00	57	0,30	4
6431247	4U80M080R3TC	6652715	4U80M080R3WC	8,0	8	16,00	63	0,30	4
6431248	4U80M100R4TE	6652716	4U80M100R4WE	10,0	10	22,00	72	0,50	4
6431249	4U80M120R5TE	6652717	4U80M120R5WE	12,0	12	26,00	83	0,50	4
6431250	4U80M160R6TE	6652718	4U80M160R6WE	16,0	16	32,00	92	0,50	6
6431401	4U80M200R7TG		–	20,0	20	38,00	104	1,00	6
6431402	4U80M250R8TG		–	25,0	25	45,00	121	1,00	6

Roughers • Series 4U40 • Radius • Metric

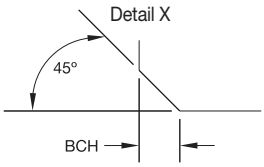


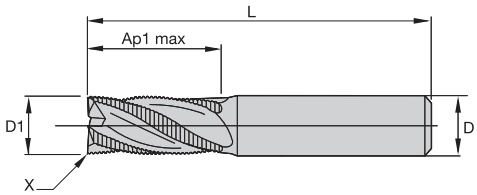


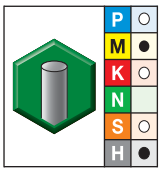
● first choice
○ alternate choice

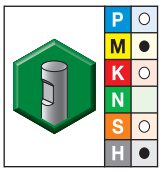
WP15PE							
order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
5583420	4U4008003T	8,0	8	8,00	63	0,75	4

Roughers • Series 4U70 • Radius • Metric





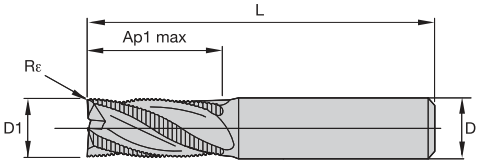


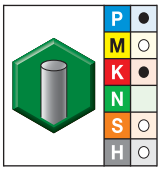


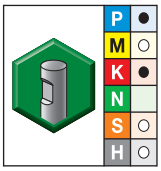
● first choice
○ alternate choice

WP15PE		WP15PE							
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
	–	5583436	4U7006002W	6,0	6	13,00	57	0,30	4
	–	5583437	4U7008003W	8,0	8	16,00	63	0,40	4
	–	5583439	4U7012005W	12,0	12	26,00	83	0,60	4
	–	5583440	4U7016006W	16,0	16	32,00	92	0,60	6
5583431	4U7016046T		–	16,0	16	32,00	92	0,60	4
5583433	4U7020047T		–	20,0	20	38,00	104	1,00	4

Roughers • Series DQ13 • Radius • Metric



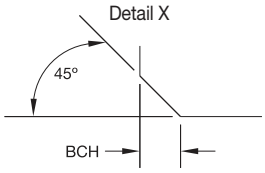


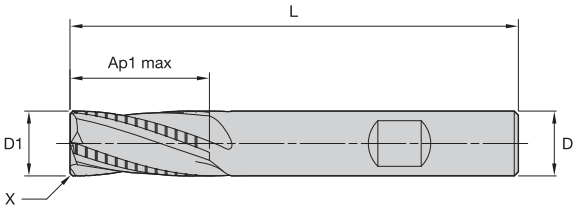


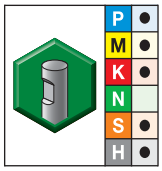
● first choice
○ alternate choice

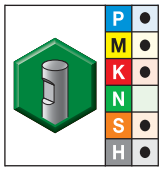
WP15PE		WP15PE								
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
5560534	DQ1303002T	5560536	DQ1303002W	3,0	6	7,00	54	0,25	3
5560535	DQ1304002T		–	4,0	6	8,00	57	0,25	3
	–	5560538	DQ1305002W	5,0	6	10,00	57	0,25	3
	–	5560539	DQ1306002W	6,0	6	10,00	57	0,45	3
	–	5560701	DQ1308003W	8,0	8	16,00	63	0,45	3
	–	5560702	DQ1310004W	10,0	10	19,00	72	0,45	3
	–	5560703	DQ1312005W	12,0	12	22,00	83	0,45	3
	–	5560704	DQ1314014W	14,0	14	22,00	83	0,45	3
	–	5560705	DQ1316006W	16,0	16	32,00	92	0,45	3
	–	5560706	DQ1318018W	18,0	18	32,00	92	0,45	3

Roughers • Series 49H6 • Chamfer • Internal Coolant • Metric





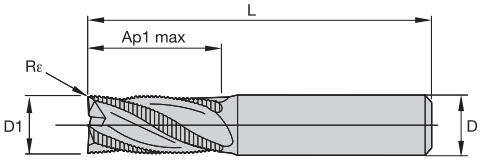


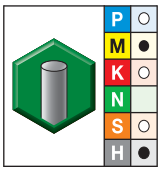


● first choice
○ alternate choice

TiAlN-LW		WP15PE							
order #	catalogue #	order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
	–	1657264	49H610004RW	10,0	10	22,00	72	0,50	4
	–	1657268	49H612005RW	12,0	12	26,00	83	0,50	4
1968206	49H614014LW		–	14,0	14	26,00	83	0,50	4
	–	1657274	49H616006RW	16,0	16	32,00	92	0,50	4

Roughers • Series 4940 • Radius • Metric



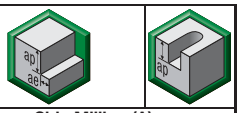


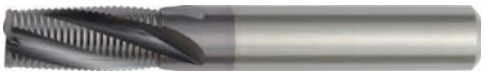
● first choice
○ alternate choice

TiAlN-LT

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
1846543	494006002LT	6,0	6	6,00	57	0,75	4
1846544	494008003LT	8,0	8	8,00	63	0,75	4
1846545	494010004LT	10,0	10	10,00	72	0,75	4
1846546	494012005LT	12,0	12	12,00	83	1,00	4
1846547	494016006LT	16,0	16	16,00	92	1,00	6

Roughers • Series 4906 • Application Data • WP15PE • Metric

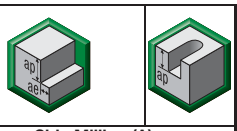




Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	4	1,5 x D	0,3 x D	0,3 x D	90	–	150	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083
	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
M	1	1,5 x D	0,4 x D	0,75 x D	90	–	115	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
	3	1,5 x D	0,4 x D	0,75 x D	60	–	70	fz	0,014	0,017	0,021	0,029	0,034	0,040	0,044	0,048	0,052	0,055	0,060
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	3	1,5 x D	0,4 x D	1 x D	110	–	130	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
S	1	1,5 x D	0,4 x D	0,75 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series 4976 • Application Data • WP15PE • Metric



Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,4 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
M	1	1,5 x D	0,4 x D	0,75 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,4 x D	0,75 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,4 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,75 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,4 x D	0,75 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,3 x D	0,75 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series 49N6 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	4	1,5 x D	0,3 x D	0,5 x D	90	–	150	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083
	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
M	1	1,5 x D	0,4 x D	0,75 x D	80	–	100	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
	3	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,014	0,017	0,021	0,029	0,034	0,040	0,044	0,048	0,052	0,055	0,060
K	1	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	3	1,5 x D	0,4 x D	1 x D	100	–	130	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
S	1	1,5 x D	0,4 x D	0,75 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,4 x D	0,75 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series 4U50 • Application Data • WS15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.								
		A		B	Cutting Speed — Vc m/min				D1 — Diameter								
		ap	ae	ap	min		max	mm	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
M	1	0,8 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	0,8 x D	0,4 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	0,8 x D	0,4 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,8 x D	0,25 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	0,8 x D	0,4 x D	0,75 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	0,8 x D	0,3 x D	0,3 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Roughers • Series 4U80 • Application Data • WS15PE/AlTiN-MW • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE/AlTiN-MW Cutting Speed — Vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1 x D	0,5 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1 x D	0,5 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	1 x D	0,3 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1 x D	0,4 x D	0,75 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Roughers • Series 4U40 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	3	0,8 x D	0,5 x D	0,75 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	0,8 x D	0,4 x D	0,5 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	0,8 x D	0,5 x D	0,75 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	0,8 x D	0,4 x D	0,5 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	0,8 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	0,8 x D	0,4 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	0,8 x D	0,5 x D	0,75 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	0,8 x D	0,5 x D	0,75 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	0,8 x D	0,4 x D	0,75 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	0,8 x D	0,4 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	0,8 x D	0,25 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	0,8 x D	0,4 x D	0,75 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	0,8 x D	0,3 x D	0,5 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	0,8 x D	0,5 x D	0,5 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	2	0,8 x D	0,2 x D	0,3 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
	3	0,8 x D	0,15 x D	0,2 x D	60	–	90	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For rougher tool with 6 flutes, use ap in slotting 60% of table value.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series 4U70 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.							
		A		B	Cutting Speed — vc m/min				D1 — Diameter						
		ap	ae	ap	min		max	mm	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	3	1 x D	0,5 x D	0,75 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1 x D	0,3 x D	0,75 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1 x D	0,5 x D	0,75 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1 x D	0,3 x D	0,3 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1 x D	0,5 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1 x D	0,5 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1 x D	0,5 x D	1 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1 x D	0,5 x D	1 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1 x D	0,3 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1 x D	0,4 x D	0,75 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1 x D	0,3 x D	0,3 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	2	1 x D	0,2 x D	0,2 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
	3	1 x D	0,2 x D	0,2 x D	60	–	90	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For rougher tool with 6 flutes, use ap in slotting 60% of table value.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series DQ13 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.										
		A		B	Cutting Speed — vc m/min				D1 — Diameter									
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1 x D	0,5 x D	0,75 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1 x D	0,5 x D	0,75 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1 x D	0,5 x D	0,75 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1 x D	0,5 x D	0,75 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1 x D	0,5 x D	0,5 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1 x D	0,5 x D	0,75 x D	60	–	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1 x D	0,4 x D	0,5 x D	50	–	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,4 x D	0,75 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1 x D	0,4 x D	0,75 x D	60	–	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1 x D	0,5 x D	0,75 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1 x D	0,5 x D	0,75 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1 x D	0,4 x D	0,75 x D	110	–	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1 x D	0,3 x D	0,4 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1 x D	0,4 x D	0,75 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1 x D	0,2 x D	0,3 x D	80	–	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series 49H6 • Application Data • WP15PE/TiAlN-LW • Metric

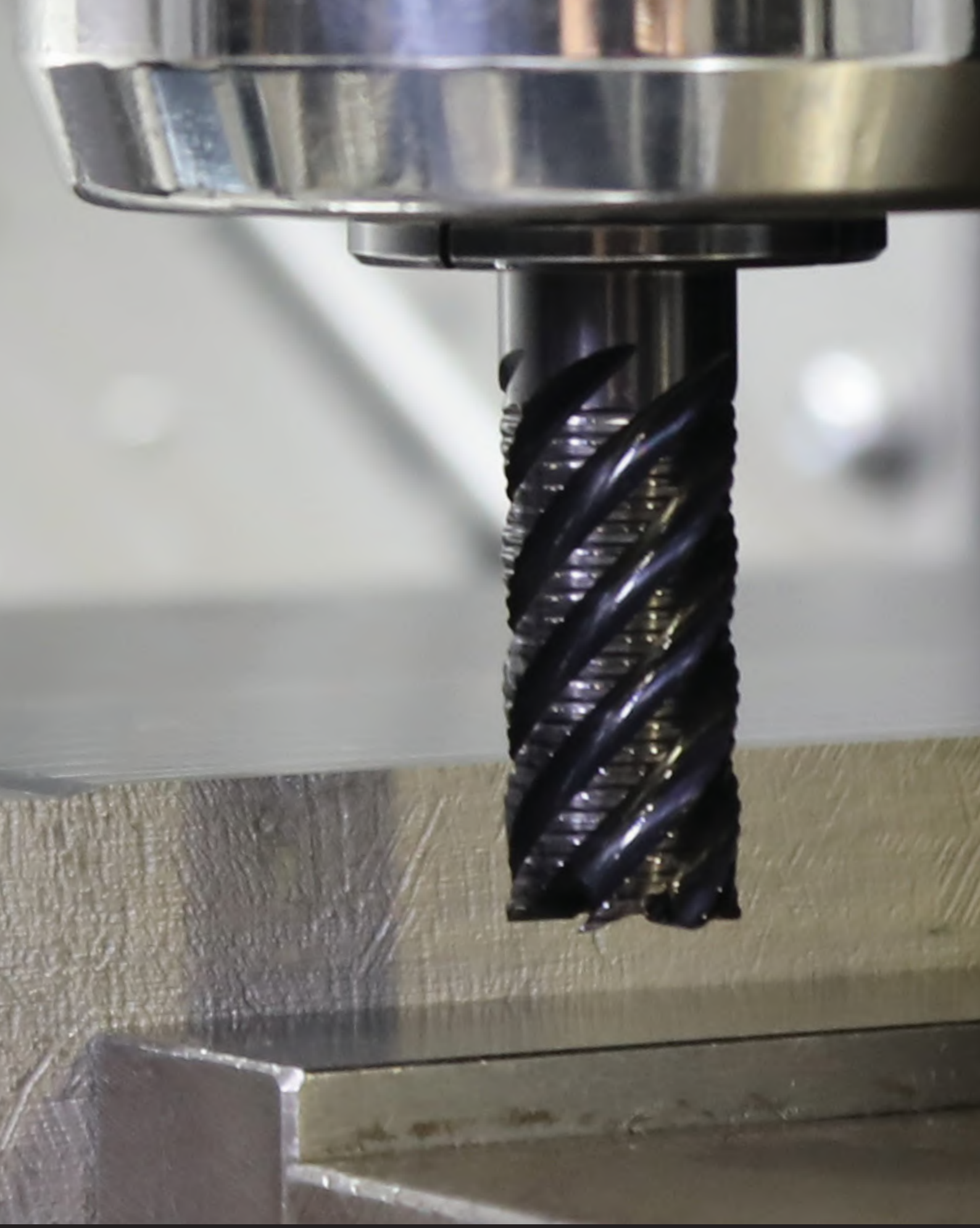
Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE/TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,048	0,058	0,066	0,074	0,081	0,086	0,091
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,048	0,058	0,066	0,074	0,081	0,086	0,091
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,048	0,058	0,066	0,074	0,081	0,086	0,091
	3	1,0 x D	0,4 x D	0,75 x D	120	–	160	fz	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	4	1,0 x D	0,3 x D	0,5 X D	90	–	150	fz	0,036	0,043	0,050	0,056	0,061	0,066	0,070
	5	1,0 x D	0,4 x D	0,75 x D	60	–	100	fz	0,032	0,039	0,045	0,051	0,056	0,060	0,065
M	1	1,0 x D	0,4 x D	0,75 x D	90	–	115	fz	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	2	1,0 x D	0,4 x D	0,75 x D	60	–	80	fz	0,032	0,039	0,045	0,051	0,056	0,060	0,065
	3	1,0 x D	0,4 x D	0,75 x D	60	–	70	fz	0,027	0,032	0,037	0,042	0,046	0,049	0,052
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,048	0,058	0,066	0,074	0,081	0,086	0,091
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,5 x D	0,4 x D	1 x D	110	–	130	fz	0,032	0,039	0,045	0,051	0,056	0,060	0,065
S	1	1,5 x D	0,5 x D	0,75 x D	50	–	90	fz	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,5 x D	0,5 x D	0,75 x D	25	–	40	fz	0,026	0,032	0,037	0,042	0,046	0,050	0,054
H	1	1,0 x D	0,3 x D	0,5 x D	80	–	140	fz	0,036	0,043	0,050	0,056	0,061	0,066	0,070

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Roughers • Series 4940 • Application Data • TiAlN-LT • Metric

Material Group		A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	3	0,8 x D	0,5 x D	0,75 x D	120	–	160	Fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	4	0,8 x D	0,4 x D	0,5 x D	90	–	150	Fz	0,028	0,038	0,046	0,056	0,069	0,088	0,098
	5	0,8 x D	0,5 x D	0,75 x D	60	–	100	Fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	6	0,8 x D	0,4 x D	0,5 x D	50	–	75	Fz	0,021	0,029	0,034	0,042	0,051	0,065	0,071
M	1	0,8 x D	0,5 x D	0,75 x D	80	–	100	Fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	2	0,8 x D	0,4 x D	0,75 x D	60	–	80	Fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	3	0,8 x D	0,4 x D	0,75 x D	60	–	80	Fz	0,021	0,029	0,034	0,042	0,051	0,065	0,071
K	1	0,8 x D	0,5 x D	0,75 x D	120	–	160	Fz	0,037	0,051	0,061	0,075	0,091	0,114	0,124
	2	0,8 x D	0,5 x D	0,75 x D	110	–	140	Fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	3	0,8 x D	0,4 x D	0,75 x D	100	–	130	Fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
S	1	0,8 x D	0,4 x D	0,75 x D	50	–	90	Fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	0,8 x D	0,25 x D	0,3 x D	25	–	40	Fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	0,8 x D	0,4 x D	0,75 x D	25	–	40	Fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	0,8 x D	0,3 x D	0,5 x D	50	–	60	Fz	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	0,8 x D	0,5 x D	0,5 x D	80	–	140	Fz	0,028	0,038	0,046	0,056	0,069	0,088	0,098
	2	0,8 x D	0,2 x D	0,3 x D	70	–	120	Fz	0,021	0,029	0,034	0,042	0,051	0,065	0,071
	3	0,8 x D	0,2 x D	0,2 x D	60	–	90	Fz	0,017	0,023	0,027	0,034	0,041	0,052	0,057

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For rougher tool with 6 flutes, use ap in slotting 60% of table value.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.



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HANITA™

Finishers

High-Performance Solid End Milling

Use the Finishers end mill range to perform precise finishes (in both surface quality and dimension) to the final stages of component machining.

Features and Benefits

Center cutting for improved floor finishing.

Designed profiles with multiple flutes and higher helix for super finishing applications.

Unique geometries designed to be material specific.

The Finishers end mill range was designed using carbide substrates with market-leading geometries and advanced surface technologies, delivering precise movements and smooth floor finishes to a range of components.

PRECISE

The Finishers end mill line will help CNC companies achieve optimal finishes in both surface quality and dimensions.

COMPLETE

From steel to cast iron and stainless steels, the Finishers offer material-specific end mills to complete component jobs.

READY

The Finishers end mill range is ready to make the final pass on critical finishing operations using specialized designs with a higher number of flutes and increased helix angles for super finishing applications.

MIRROR FINISH

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
WP15PE TiAlN	2–8

DIAMETER RANGE

METRIC
1–25mm

INDUSTRY

- GENERAL ENGINEERING
- AEROSPACE
- ENERGY
- TRANSPORTATION

APPLICATIONS

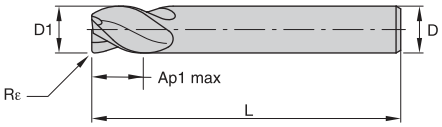
MATERIALS

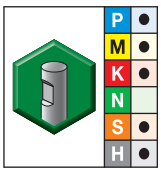
P M K S H

SIDE MILLING

3D PROFILING

Finishers • Series DC03 • Radius • Metric



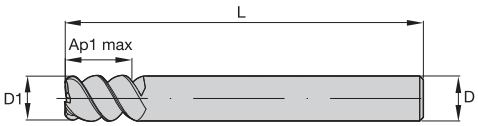


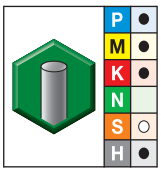
● first choice
○ alternate choice

TiAlN-LW

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
1661856	DC0303002LW	3,0	6	4,00	50	0,25	3
1661858	DC0304002LW	4,0	6	5,00	54	0,25	3
1661862	DC0306002LW	6,0	6	7,00	54	0,45	3
1661866	DC0308003LW	8,0	8	9,00	58	0,45	3
1661868	DC0310004LW	10,0	10	11,00	66	0,45	3
1661870	DC0312005LW	12,0	12	12,00	73	0,45	3

Finishers • Series 4603 • Sharp Edge • Metric



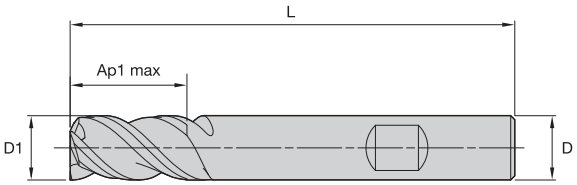


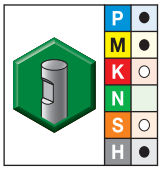
● first choice
○ alternate choice

WP15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
1656750	460303002RT	3,0	6	8,00	57	3
1656758	460304002RT	4,0	6	11,00	57	3
1656773	460306002RT	6,0	6	13,00	57	3
1656781	460308003RT	8,0	8	19,00	63	3
1656791	460310004RT	10,0	10	22,00	72	3
1656799	460312005RT	12,0	12	26,00	83	3
1656807	460316006RT	16,0	16	32,00	92	3

Finishers • Series D503 D513 • Square End • Metric

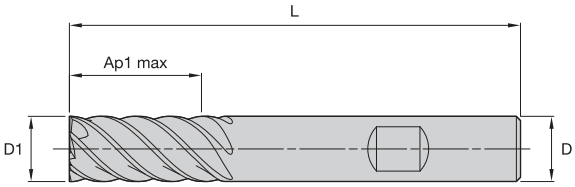


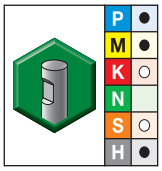


● first choice
○ alternate choice

TiAlN						
order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
1661574	D50302002RW	2,0	6	3,00	50	3
6613012	D503025C2W	2,5	6	3,00	50	3
1661578	D50303002RW	3,0	6	4,00	50	3
6613013	D503030C2W	3,0	6	4,00	50	3
1661680	D51303002RW	3,0	6	7,00	57	3
6613014	D513035C2W	3,5	6	7,00	57	3
1661583	D50304002RW	4,0	6	5,00	54	3
6613015	D503040C2W	4,0	6	5,00	54	3
1661684	D51304002RW	4,0	6	8,00	57	3
1661588	D50305002RW	5,0	6	6,00	54	3
1661688	D51305002RW	5,0	6	10,00	57	3
1661593	D50306002RW	6,0	6	7,00	54	3
6613016	D503060C2W	6,0	6	7,00	54	3
1661692	D51306002RW	6,0	6	10,00	57	3
6613017	D503080C3W	8,0	8	9,00	58	3
1661603	D50308003RW	8,0	8	9,00	58	3
1661701	D51308003RW	8,0	8	16,00	63	3
6613018	D503100C4W	10,0	10	11,00	66	3
1661710	D51310004RW	10,0	10	19,00	72	3
6613019	D503120C5W	12,0	12	12,00	73	3
1661715	D51312005RW	12,0	12	22,00	83	3
1661720	D51314014RW	14,0	14	22,00	83	3
1661725	D51316006RW	16,0	16	26,00	92	3

Finishers • Series D507 D517 • Sharp Edge • Metric



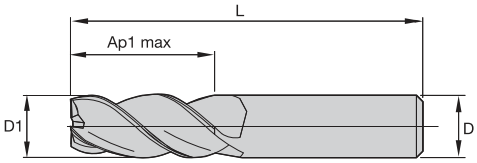


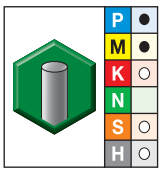
WP15PE

● first choice
○ alternate choice

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
5559100	D50706002W	6,0	6	10,00	54	6
5559108	D51706002W	6,0	6	13,00	57	6
5559101	D50708003W	8,0	8	12,00	58	6
5559109	D51708003W	8,0	8	19,00	63	6
5559102	D50710004W	10,0	10	14,00	66	6
5559110	D51710004W	10,0	10	22,00	72	6
5559103	D50712005W	12,0	12	16,00	73	6
5559111	D51712005W	12,0	12	26,00	83	6
5559112	D51714014W	14,0	14	26,00	83	6
5559105	D50716006W	16,0	16	22,00	82	6
5559113	D51716006W	16,0	16	32,00	92	6
5559114	D51718018W	18,0	18	32,00	92	6
5559107	D50720007W	20,0	20	26,00	92	6
5559115	D51720007W	20,0	20	38,00	104	6

Finishers • Series 4503 JJ • Sharp Edge • JIS



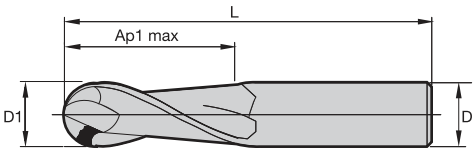


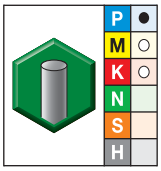
● first choice
○ alternate choice

WP15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
5559170	450301001T	1,0	4	3,00	50	3
5559171	450301501T	1,5	4	3,00	50	3
5559172	450302001T	2,0	4	3,00	50	3
5559173	450302501T	2,5	4	4,00	50	3
5559174	450302511T	2,5	4	5,00	50	3
5559175	450303002T	3,0	6	8,00	50	3
5559176	450303502T	3,5	6	12,00	50	3
5559177	450304002T	4,0	6	12,00	50	3
5559178	450304502T	4,5	6	14,00	50	3
5559179	450305002T	5,0	6	14,00	50	3
5559180	450306002T	6,0	6	16,00	50	3
5559181	450308003T	8,0	8	20,00	63	3
5559182	450310004T	10,0	10	22,00	76	3
5559183	450312005T	12,0	12	25,00	76	3
5559184	450316006T	16,0	16	32,00	89	3
5559185	450320007T	20,0	20	38,00	104	3

Finishers • Series 4001 JJ • Ball Nose • JIS





● first choice
○ alternate choice

WP15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
5559146	400101001T	1,0	4	3,00	50	2
5559147	400101501T	1,5	4	3,00	50	2
5559148	400102001T	2,0	4	3,00	50	2
5559149	400103002T	3,0	6	9,50	58	2
5559160	400104002T	4,0	6	12,00	76	2
5559161	400105002T	5,0	6	14,00	76	2
5559162	400106002T	6,0	6	16,00	100	2
5559163	400108003T	8,0	8	20,00	100	2
5559164	400110004T	10,0	10	22,00	100	2
5559165	400112005T	12,0	12	25,00	125	2
5559167	400116006T	16,0	16	32,00	150	2

Finishers • Series DC03 • Application Data • TiAlN-LW • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	0,75 x D	0,4 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,028	0,028	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	1	0,75 x D	0,4 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,028	0,028	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	0,75 x D	0,4 x D	0,5 x D	140	–	190	fz	0,018	0,023	0,023	0,023	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	3	0,75 x D	0,4 x D	0,5 x D	120	–	160	fz	0,016	0,021	0,021	0,021	0,021	0,033	0,045	0,054	0,062	0,077	0,088
	4	0,75 x D	0,4 x D	0,3 x D	90	–	150	fz	0,014	0,019	0,019	0,019	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	5	0,75 x D	0,4 x D	0,5 x D	60	–	100	fz	0,014	0,019	0,019	0,019	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	6	0,75 x D	0,4 x D	0,3 x D	50	–	75	fz	0,012	0,016	0,016	0,016	0,016	0,025	0,034	0,040	0,047	0,057	0,065
M	1	0,75 x D	0,4 x D	0,5 x D	90	–	115	fz	0,018	0,023	0,023	0,023	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	0,75 x D	0,4 x D	0,5 x D	60	–	80	fz	0,014	0,019	0,019	0,019	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	3	0,75 x D	0,4 x D	0,5 x D	60	–	70	fz	0,012	0,016	0,016	0,016	0,016	0,025	0,034	0,040	0,047	0,057	0,065
K	1	0,75 x D	0,4 x D	0,5 x D	120	–	150	fz	0,021	0,028	0,028	0,028	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	0,75 x D	0,4 x D	0,5 x D	110	–	140	fz	0,018	0,023	0,023	0,023	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	3	0,75 x D	0,4 x D	0,5 x D	110	–	130	fz	0,014	0,019	0,019	0,019	0,019	0,029	0,040	0,048	0,056	0,070	0,081
S	1	0,75 x D	0,4 x D	0,3 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	0,75 x D	0,4 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	0,75 x D	0,4 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	0,75 x D	0,4 x D	0,5 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	0,75 x D	0,4 x D	0,3 x D	80	–	140	fz	0,016	0,021	0,021	0,021	0,021	0,033	0,045	0,054	0,062	0,077	0,088

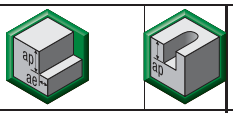
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

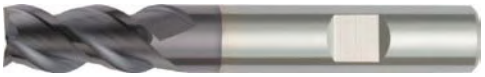
Finishers • Series 4603 • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WP15PE/TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0	
P	0	1,5 x D	0,3 x D	0,5 x D	150	–	200	fz	0,017	0,023	0,029	0,035	0,048	0,058	0,066	0,081	0,086	0,091	
	1	1,5 x D	0,3 x D	0,5 x D	150	–	200	fz	0,017	0,023	0,029	0,035	0,048	0,058	0,066	0,081	0,086	0,091	
	2	1,5 x D	0,3 x D	0,5 x D	140	–	190	fz	0,017	0,023	0,029	0,035	0,048	0,058	0,066	0,081	0,086	0,091	
	3	1,5 x D	0,3 x D	0,5 x D	120	–	160	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081	
	4	1,5 x D	0,3 x D	0,3 x D	90	–	150	fz	0,013	0,017	0,022	0,026	0,036	0,043	0,050	0,061	0,066	0,070	
	5	1,5 x D	0,3 x D	0,5 x D	60	–	100	fz	0,011	0,015	0,019	0,024	0,032	0,039	0,045	0,056	0,060	0,065	
	6	1,5 x D	0,3 x D	0,3 x D	50	–	75	fz	0,010	0,013	0,016	0,020	0,027	0,032	0,037	0,046	0,049	0,052	
M	1	1,5 x D	0,3 x D	0,5 x D	90	–	115	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081	
	2	1,5 x D	0,3 x D	0,5 x D	60	–	80	fz	0,011	0,015	0,019	0,024	0,032	0,039	0,045	0,056	0,060	0,065	
	3	1,5 x D	0,3 x D	0,5 x D	60	–	70	fz	0,010	0,013	0,016	0,020	0,027	0,032	0,037	0,046	0,049	0,052	
K	1	1,5 x D	0,3 x D	0,5 x D	120	–	150	fz	0,017	0,023	0,029	0,035	0,048	0,058	0,066	0,081	0,086	0,091	
	2	1,5 x D	0,3 x D	0,5 x D	110	–	140	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081	
	3	1,5 x D	0,3 x D	0,5 x D	110	–	130	fz	0,011	0,015	0,019	0,024	0,032	0,039	0,045	0,056	0,060	0,065	
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101	
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054	
	3	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054	
	4	1,5 x D	0,3 x D	0,5 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,064	0,069	0,074	
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,013	0,017	0,022	0,026	0,036	0,043	0,050	0,061	0,066	0,070	

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Finishers • Series D503 • Application Data • TiAlN • Metric

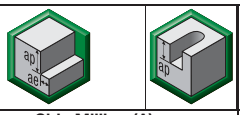




Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	0,75 x D	0,4 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	0,75 x D	0,4 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	0,75 x D	0,4 x D	0,5 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	0,75 x D	0,4 x D	0,5 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	0,75 x D	0,4 x D	0,3 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	0,75 x D	0,4 x D	0,5 x D	60	–	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	0,75 x D	0,4 x D	0,3 x D	50	–	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	0,75 x D	0,4 x D	0,5 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	0,75 x D	0,4 x D	0,5 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	0,75 x D	0,4 x D	0,5 x D	60	–	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	0,75 x D	0,4 x D	0,5 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	0,75 x D	0,4 x D	0,5 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	0,75 x D	0,4 x D	0,5 x D	110	–	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	0,75 x D	0,4 x D	0,3 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	0,75 x D	0,4 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	0,75 x D	0,4 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	0,75 x D	0,4 x D	0,5 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	0,75 x D	0,4 x D	0,3 x D	80	–	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on greater than 12mm diameters.

Finishers • Series D513 • Application Data • TiAlN • Metric



Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,25 x D	0,2 x D	0,25 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,25 x D	0,2 x D	0,25 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,2 x D	0,25 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,25 x D	0,2 x D	0,25 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,25 x D	0,2 x D	0,25 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,25 x D	0,2 x D	0,25 x D	60	–	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1,25 x D	0,2 x D	0,25 x D	50	–	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1,25 x D	0,2 x D	0,25 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,2 x D	0,25 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,25 x D	0,2 x D	0,25 x D	60	–	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1,25 x D	0,2 x D	0,25 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,2 x D	0,25 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,25 x D	0,2 x D	0,25 x D	110	–	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1,25 x D	0,2 x D	0,25 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,2 x D	0,25 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,25 x D	0,2 x D	0,25 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	1,25 x D	0,2 x D	0,25 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1,25 x D	0,2 X D	0,25 x D	80	–	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Finishers • Series D507 • Application Data • WP15PE • Metric

Material Group		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).									
		A		Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	min		max	mm	4,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,0 x D	0,2 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,0 x D	0,2 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,0 x D	0,2 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,0 x D	0,1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,0 x D	0,1 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,0 x D	0,1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1,0 x D	0,1 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1,0 x D	0,1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,0 x D	0,1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,0 x D	0,1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1,0 x D	0,1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,0 x D	0,1 x D	110	–	140	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,0 x D	0,1 x D	110	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1,0 x D	0,1 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,0 x D	0,1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,0 x D	0,15 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	1,0 x D	0,15 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1,0 x D	0,1 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

Finishers • Series D517 • Application Data • WP15PE • Metric

Material Group		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).									
		A		Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	min		max	mm	4,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,05 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,05 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,05 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,05 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,05 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	Ap1 max	0,05 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	Ap1 max	0,05 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	Ap1 max	0,05 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,05 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	Ap1 max	0,05 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	Ap1 max	0,05 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,05 x D	110	–	140	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	Ap1 max	0,05 x D	110	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	Ap1 max	0,04 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,04 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	Ap1 max	0,05 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	4	Ap1 max	0,05 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	Ap1 max	0,04 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

Finishers • Series 4503 JJ • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 3,0	4,0	5,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0
P	0	1,5 x D	0,3 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	1	1,5 x D	0,3 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	2	1,5 x D	0,3 x D	0,5 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	3	1,5 x D	0,3 x D	0,5 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	4	1,5 x D	0,3 x D	0,3 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,077	0,083	0,088
	5	1,5 x D	0,3 x D	0,5 x D	60	–	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
	6	1,5 x D	0,3 x D	0,3 x D	50	–	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,057	0,061	0,065
M	1	1,5 x D	0,3 x D	0,5 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	0,5 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
	3	1,5 x D	0,3 x D	0,5 x D	60	–	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,057	0,061	0,065
K	1	1,5 x D	0,3 x D	0,5 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	2	1,5 x D	0,3 x D	0,5 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	3	1,5 x D	0,3 x D	0,5 x D	110	–	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054
	3	1,5 x D	0,3 x D	0,5 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054
	4	1,5 x D	0,3 x D	0,5 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,064	0,069	0,074
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

Finishers • Series 4001 JJ • Application Data • WP15PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,25 x D	0,25 x D	0,5 x D	150	–	200	fz	0,012	0,019	0,026	0,032	0,039	0,054	0,065	0,075	0,083	0,091	0,097	0,103	0,111
	1	1,25 x D	0,25 x D	0,5 x D	150	–	200	fz	0,012	0,019	0,026	0,032	0,039	0,054	0,065	0,075	0,083	0,091	0,097	0,103	0,111
	2	1,25 x D	0,25 x D	0,5 x D	140	–	190	fz	0,012	0,019	0,026	0,032	0,039	0,054	0,065	0,075	0,083	0,091	0,097	0,103	0,111
	3	1,25 x D	0,25 x D	0,5 x D	120	–	160	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,063	0,071	0,078	0,085	0,091	0,102
	4	1,25 x D	0,25 x D	0,3 x D	90	–	150	fz	0,009	0,014	0,019	0,024	0,030	0,040	0,049	0,056	0,063	0,069	0,075	0,079	0,088
M	1	1,25 x D	0,25 x D	0,5 x D	90	–	115	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,063	0,071	0,078	0,085	0,091	0,102
	2	1,25 x D	0,25 x D	0,5 x D	60	–	80	fz	0,008	0,013	0,017	0,022	0,026	0,036	0,044	0,051	0,057	0,063	0,068	0,073	0,082
K	1	1,25 x D	0,25 x D	0,5 x D	120	–	150	fz	0,012	0,019	0,026	0,032	0,039	0,054	0,065	0,075	0,083	0,091	0,097	0,103	0,111
	2	1,25 x D	0,25 x D	0,5 x D	110	–	140	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,063	0,071	0,078	0,085	0,091	0,102
N	1	1,25 x D	0,25 x D	0,5 x D	500	–	2000	fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,162	0,180	0,225
	2	1,25 x D	0,25 x D	0,5 x D	500	–	1500	fz	0,016	0,024	0,032	0,041	0,049	0,065	0,081	0,097	0,113	0,130	0,146	0,162	0,203
	3	1,25 x D	0,25 x D	0,5 x D	250	–	1000	fz	0,016	0,024	0,032	0,041	0,049	0,065	0,081	0,097	0,113	0,130	0,146	0,162	0,203
	4	1,25 x D	0,25 x D	0,5 x D	100	–	750	fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,162	0,180	0,225

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameters.

ALUFLASH™

High-Performance Solid End Milling

ALUFLASH end mills are for machining companies seeking a vibration-free tool capable of achieving advanced milling applications at accelerated RPMs.

Features and Benefits

Balanced by design to significantly limit vibrations at high RPMs.

"W" flute shape form evacuates chips to increase process security.

Parabolic core for increased tool stability and reduced deflection and risk of breakage.

Double rake gashing for improved chip evacuation and higher ramping capabilities and Z-axis machining.

ALUFLASH end mills will drill into the full material and execute advanced ramping angles at high-feed rates without RPM limitations.

SAFE

The ALUFLASH end mills' balanced design obliterates any apprehension of spindle damage.

ADVANCED

ALUFLASH provides advanced milling capabilities with steep ramping angles, drilling into the full material and cornering without vibration marks.

ACCELERATED

The ALUFLASH end mills enable machinists to increase cutting speeds to the machine capacity, creating limitless performance in any aluminum application.

ACCELERATED ALUMINUM MACHINING

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
UNCOATED	2 & 3

DIAMETER RANGE

METRIC
3–20mm

INDUSTRY

GENERAL ENGINEERING

AEROSPACE

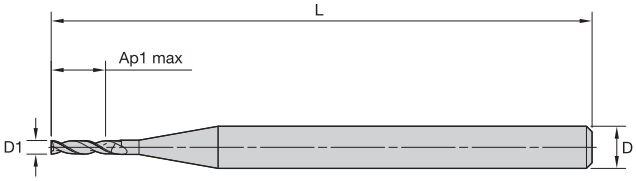
APPLICATIONS

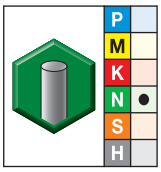
MATERIALS

N

- SIDE MILLING
- SLOTTING
- HELICAL INTERPOLATION
- RAMPING
- DYNAMIC MILLING
- PLUNGING
- DRILLING

ALUFLASH • Series 2A09 • Square End • 2 Flute • Regular Length • Cylindrical Shank • Metric



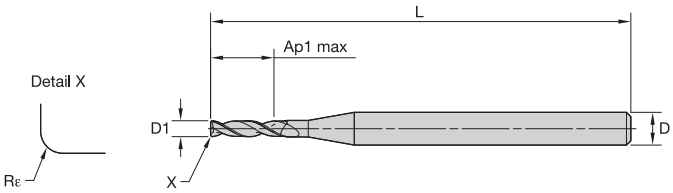


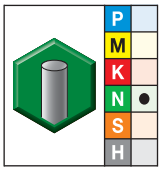
UNCOATED

● first choice
○ alternate choice

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
6853514	2A09M01000SZT	1,0	3	4,00	38	2
6853515	2A09M01500SZT	1,5	3	6,00	38	2
6853517	2A09M02000SZT	2,0	3	8,00	38	2
6853519	2A09M02500SZT	2,5	3	9,00	38	2
6853542	2A09M04001SZT	4,0	4	12,00	50	2
6853544	2A09M05002SZT	5,0	5	14,00	50	2
6853547	2A09M06003SZT	6,0	6	16,00	50	2
6853549	2A09M08004SZT	8,0	8	20,00	63	2
6853552	2A09M12006SZT	12,0	12	25,00	76	2
6853554	2A09M16008SZT	16,0	16	32,00	89	2
6853556	2A09M20009SZT	20,0	20	40,00	104	2

ALUFLASH • Series 2A09 • Radius • 2 Flute • Regular Length • Cylindrical Shank • Metric



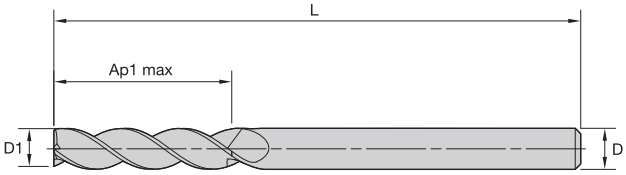


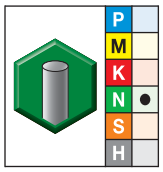
UNCOATED

● first choice
○ alternate choice

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	Z U
6853516	2A09M01500RAT	1,5	3	6,00	38	0,20	2
6853518	2A09M02000RAT	2,0	3	8,00	38	0,20	2
6853520	2A09M02500RAT	2,5	3	9,00	38	0,20	2
6853541	2A09M03000RAT	3,0	3	12,00	38	0,20	2
6853543	2A09M04001RAT	4,0	4	12,00	50	0,20	2
6853546	2A09M05002RAT	5,0	5	14,00	50	0,20	2
6853548	2A09M06003RET	6,0	6	16,00	50	0,50	2
6853550	2A09M08004RET	8,0	8	20,00	63	0,50	2
6853551	2A09M10005RJT	10,0	10	22,00	76	1,00	2
6853553	2A09M12006RJT	12,0	12	25,00	76	1,00	2
6853555	2A09M16008RJT	16,0	16	32,00	89	1,00	2
6853557	2A09M20009RJT	20,0	20	40,00	104	1,00	2

ALUFLASH • Series 3A09 • Square End • 3 Flute • Regular Length • Cylindrical Shank • Metric



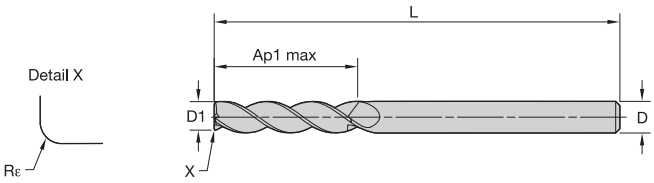


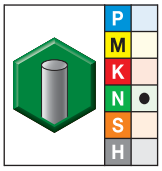
UNCOATED

● first choice
○ alternate choice

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Z U
6853511	3A09M03000SZT	3,0	3	12,00	38	3

ALUFLASH • Series 3A09 • Radius • 3 Flute • Regular Length • Cylindrical Shank • Metric



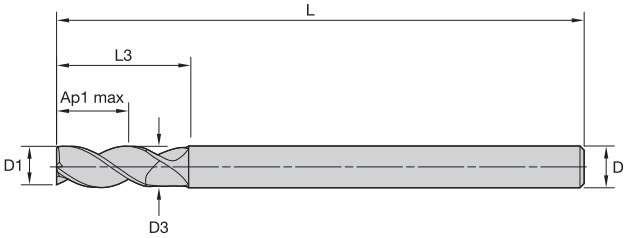


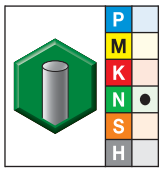
UNCOATED

● first choice
○ alternate choice

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	Z U
6853512	3A09M03000RAT	3,0	3	12,00	38	0,20	3
6853513	3A09M04001RET	4,0	4	12,00	63	0,50	3

ALUFLASH • Series 3AN9 • Square End • 3 Flute • Regular Length • Regular Neck • Cylindrical Shank • Metric



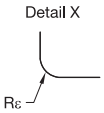


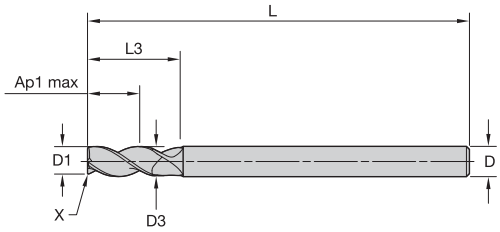
UNCOATED

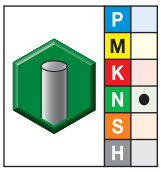
● first choice
○ alternate choice

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6853460	3AN9M04001SZT	4,0	4	3,76	8,00	50	12,00	3
6853462	3AN9M05002SZT	5,0	5	4,70	10,00	63	15,00	3
6853465	3AN9M06003SZT	6,0	6	5,64	13,00	63	18,00	3
6853469	3AN9M08004SZT	8,0	8	7,52	18,00	76	24,00	3
6853474	3AN9M10005SZT	10,0	10	9,40	22,00	76	30,00	3
6853479	3AN9M12006SZT	12,0	12	11,28	25,00	76	36,00	3
6853486	3AN9M16008SZT	16,0	16	15,04	32,00	89	48,00	3
6853494	3AN9M20009SZT	20,0	20	18,80	40,00	115	60,00	3

ALUFLASH • Series 3AN9 • Radius • 3 Flute • Regular Length • Regular Neck • Cylindrical Shank • Metric





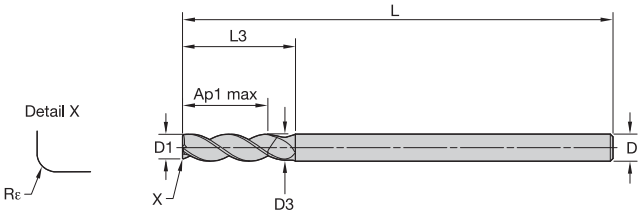


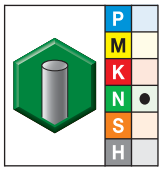
UNCOATED

● first choice
○ alternate choice

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Rε	Z U
6853461	3AN9M04001RAT	4,0	4	3,76	8,00	50	12,00	0,20	3
6853463	3AN9M05002RAT	5,0	5	4,70	10,00	63	15,00	0,20	3
6853464	3AN9M05002RET	5,0	5	4,70	10,00	63	15,00	0,50	3
6853466	3AN9M06003RAT	6,0	6	5,64	13,00	63	18,00	0,20	3
6853467	3AN9M06003RET	6,0	6	5,64	13,00	63	18,00	0,50	3
6853468	3AN9M06003RJT	6,0	6	5,64	13,00	63	18,00	1,00	3
6853470	3AN9M08004RAT	8,0	8	7,52	18,00	76	24,00	0,20	3
6853471	3AN9M08004RET	8,0	8	7,52	18,00	76	24,00	0,50	3
6853473	3AN9M08004RHT	8,0	8	7,52	18,00	76	24,00	1,50	3
6853472	3AN9M08004RJT	8,0	8	7,52	18,00	76	24,00	1,00	3
6853475	3AN9M10005RAT	10,0	10	9,40	22,00	76	30,00	0,20	3
6853476	3AN9M10005RET	10,0	10	9,40	22,00	76	30,00	0,50	3
6853478	3AN9M10005RHT	10,0	10	9,40	22,00	76	30,00	1,50	3
6853477	3AN9M10005RJT	10,0	10	9,40	22,00	76	30,00	1,00	3
6853480	3AN9M12006RAT	12,0	12	11,28	25,00	76	36,00	0,20	3
6853481	3AN9M12006RET	12,0	12	11,28	25,00	76	36,00	0,50	3
6853483	3AN9M12006RHT	12,0	12	11,28	25,00	76	36,00	1,50	3
6853482	3AN9M12006RJT	12,0	12	11,28	25,00	76	36,00	1,00	3
6853484	3AN9M12006RKT	12,0	12	11,28	25,00	76	36,00	2,00	3
6853485	3AN9M12006RPT	12,0	12	11,28	25,00	76	36,00	3,00	3
6853487	3AN9M16008RAT	16,0	16	15,04	32,00	89	48,00	0,20	3
6853488	3AN9M16008RET	16,0	16	15,04	32,00	89	48,00	0,50	3
6853490	3AN9M16008RHT	16,0	16	15,04	32,00	89	48,00	1,50	3
6853489	3AN9M16008RJT	16,0	16	15,04	32,00	89	48,00	1,00	3
6853491	3AN9M16008RMT	16,0	16	15,04	32,00	89	48,00	2,50	3
6853492	3AN9M16008RPT	16,0	16	15,04	32,00	89	48,00	3,00	3
6853493	3AN9M16008RQT	16,0	16	15,04	32,00	89	48,00	4,00	3
6853495	3AN9M20009RAT	20,0	20	18,80	40,00	115	60,00	0,20	3
6853496	3AN9M20009RHT	20,0	20	18,80	40,00	115	60,00	1,50	3
6853497	3AN9M20009RKT	20,0	20	18,80	40,00	115	60,00	2,00	3
6853498	3AN9M20009RPT	20,0	20	18,80	40,00	115	60,00	3,00	3
6853499	3AN9M20009RQT	20,0	20	18,80	40,00	115	60,00	4,00	3
6853500	3AN9M20009RRT	20,0	20	18,80	40,00	115	60,00	5,00	3

ALUFLASH • Series 3AP9 • Radius • 3 Flute • Long Length • Regular Neck • Cylindrical Shank • Metric



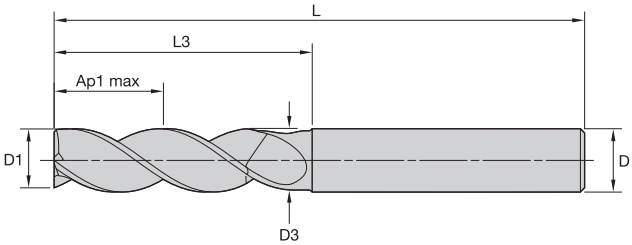


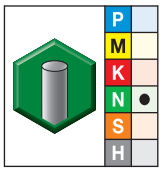
UNCOATED

● first choice
○ alternate choice

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Rε	Z U
6853439	3AP9M04011RAT	4,0	4	3,76	12,00	63	16,00	0,20	3
6853440	3AP9M05002RAT	5,0	5	4,70	15,00	63	20,00	0,20	3
6853441	3AP9M06013RET	6,0	6	5,64	18,00	76	24,00	0,50	3
6853442	3AP9M06013RJT	6,0	6	5,64	18,00	76	24,00	1,00	3
6853443	3AP9M08014RET	8,0	8	7,52	24,00	76	32,00	0,50	3
6853444	3AP9M08014RJT	8,0	8	7,52	24,00	76	32,00	1,00	3
6853445	3AP9M10015RET	10,0	10	9,40	30,00	89	40,00	0,50	3
6853446	3AP9M10015RHT	10,0	10	9,40	30,00	89	40,00	1,50	3
6853447	3AP9M10015RKT	10,0	10	9,40	30,00	89	40,00	2,00	3
6853449	3AP9M12016RET	12,0	12	11,28	36,00	100	48,00	0,50	3
6853450	3AP9M12016RHT	12,0	12	11,28	36,00	100	48,00	1,50	3
6853451	3AP9M12016RPT	12,0	12	11,28	36,00	100	48,00	3,00	3
6853452	3AP9M16018RET	16,0	16	15,04	48,00	110	64,00	0,50	3
6853453	3AP9M16018RHT	16,0	16	15,04	48,00	110	64,00	1,50	3
6853454	3AP9M16018RPT	16,0	16	15,04	48,00	110	64,00	3,00	3
6853455	3AP9M20019RET	20,0	20	18,80	60,00	150	80,00	0,50	3
6853456	3AP9M20019RHT	20,0	20	18,80	60,00	150	80,00	1,50	3
6853457	3AP9M20019RKT	20,0	20	18,80	60,00	150	80,00	2,00	3
6853458	3AP9M20019RPT	20,0	20	18,80	60,00	150	80,00	3,00	3
6853459	3AP9M20019RQT	20,0	20	18,80	60,00	150	80,00	4,00	3

ALUFLASH • Series 3AP9 • Square End • 3 Flute • Long Length • Regular Neck • Cylindrical Shank • Metric



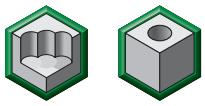


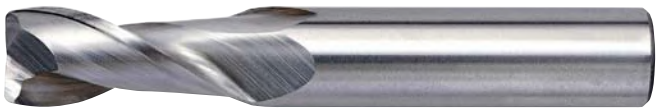
UNCOATED

● first choice
○ alternate choice

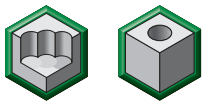
order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6853448	3AP9M12016SZT	12,0	12	11,28	36,00	100	48,00	3

ALUFLASH • Plunging • Application Data • Metric





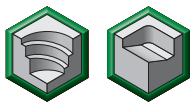
Material Group		Plunging/Drilling			UNCOATED			Recommended feed per revolution (fn =mm/rev) for plunging 2-flute end mills												
					Cutting Speed — Vc m/min				D1 — Diameter											
		Max Depth	Applicable	Coolant	min	Start	max	mm	2,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
N	1	1,5 x D	●	Required	120	260	400	fn	0,080	0,120	0,135	0,150	0,160	0,200	0,220	0,235	0,250	0,265	0,280	0,300
	2	1,5 x D	●	Required	120	250	280	fn	0,080	0,120	0,135	0,150	0,160	0,200	0,220	0,235	0,250	0,265	0,280	0,300
	3	1,5 x D	●	Required	100	200	260	fn	0,080	0,120	0,135	0,150	0,160	0,200	0,220	0,235	0,250	0,265	0,280	0,300
	4	1 x D	●	Required	60	150	260	fn	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,210	0,220	0,235	0,250	0,280
	5	1,5 x D	●	Required	60	200	400	fn	0,080	0,120	0,135	0,150	0,160	0,200	0,220	0,235	0,250	0,265	0,280	0,300

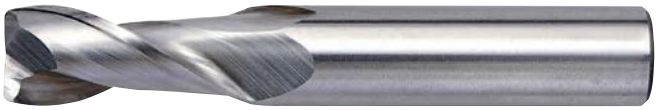


Material Group		Plunging/Drilling			UNCOATED			Recommended feed per revolution (fn =mm/rev) for plunging 3-flute end mills												
					Cutting Speed — Vc m/min				D1 — Diameter											
		Max Depth	Applicable	Coolant	min	Start	max	mm	2,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
N	1	1,5 x D	●	Required	120	260	400	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210
	2	1,5 x D	●	Required	120	250	280	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210
	3	1,5 x D	●	Required	100	200	260	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210
	4	1 x D	●	Required	60	150	260	fn	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,147	0,154	0,165	0,175	0,196
	5	1,5 x D	●	Required	60	200	400	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210

ALUFLASH • Ramping 2 Flute • Application Data • Metric

Helical Interpolation / Ramping 0° - 15°



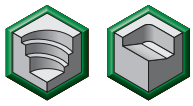


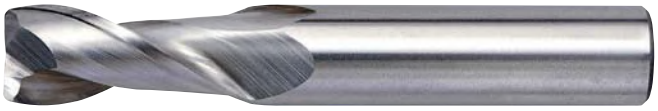
UNCOATED

Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping

Material Group		Max Depth	Cutting Speed — Vc m/min min	Start	max	Diameter – D1 [Ømin–Ømax] mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						mm	2,5-4,8	4,6-7,6	5,8-9,5	6,9-11,4	9,2-15,2	11,5-19,0	13,8-22,8	16,1-26,6	18,4-30,4	20,7-34,2	23,0-38,0	28,8-47,5
N	1	1,25 x D1	500	600	2000	fz	0,022	0,044	0,055	0,066	0,088	0,110	0,132	0,153	0,176	0,198	0,220	0,275
N	2	1,25 x D1	500	600	1500	fz	0,020	0,040	0,048	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247
N	3	1,25 x D1	500	600	1500	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
N	4	1,25 x D1	400	450	750	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
N	5	1,25 x D1	250	400	1000	fz	0,020	0,040	0,050	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247

Helical Interpolation / Ramping 15° - 30°



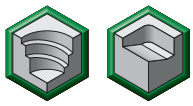


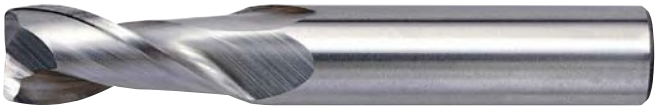
UNCOATED

Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping

Material Group		Max Depth	Cutting Speed — Vc m/min min	Start	max	Diameter – D1 [Ømin–Ømax] mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						mm	2,5-4,8	4,6-7,6	5,8-9,5	6,9-11,4	9,2-15,2	11,5-19,0	13,8-22,8	16,1-26,6	18,4-30,4	20,7-34,2	23,0-38,0	28,8-47,5
N	1	1,25 x D1	500	600	1600	fz	0,017	0,033	0,041	0,050	0,066	0,082	0,099	0,115	0,132	0,148	0,165	0,206
N	2	1,25 x D1	500	600	1200	fz	0,015	0,030	0,036	0,045	0,059	0,074	0,089	0,104	0,119	0,134	0,148	0,185
N	3	1,25 x D1	500	600	1200	fz	0,012	0,023	0,029	0,035	0,046	0,058	0,069	0,080	0,092	0,104	0,115	0,144
N	4	1,25 x D1	400	450	600	fz	0,012	0,023	0,029	0,035	0,046	0,058	0,069	0,080	0,092	0,104	0,115	0,144
N	5	1,25 x D1	250	400	800	fz	0,015	0,030	0,038	0,045	0,059	0,074	0,089	0,104	0,119	0,134	0,148	0,185

Helical Interpolation / Ramping 30° - 45°





UNCOATED

Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping

Material Group		Max Depth	Cutting Speed — Vc m/min min	Start	max	Diameter – D1 [Ømin–Ømax] mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						mm	2,5-4,8	4,6-7,6	5,8-9,5	6,9-11,4	9,2-15,2	11,5-19,0	13,8-22,8	16,1-26,6	18,4-30,4	20,7-34,2	23,0-38,0	28,8-47,5
N	1	1,25 x D1	420	500	800	fz	0,013	0,026	0,033	0,040	0,053	0,066	0,079	0,092	0,106	0,119	0,132	0,165
N	2	1,25 x D1	420	500	800	fz	0,012	0,024	0,029	0,036	0,048	0,059	0,071	0,083	0,095	0,107	0,119	0,148
N	3	1,25 x D1	420	500	800	fz	0,009	0,018	0,023	0,028	0,037	0,046	0,055	0,064	0,074	0,083	0,092	0,115
N	4	1,25 x D1	340	380	450	fz	0,009	0,018	0,023	0,028	0,037	0,046	0,055	0,064	0,074	0,083	0,092	0,115
N	5	1,25 x D1	210	340	600	fz	0,012	0,024	0,030	0,036	0,048	0,059	0,071	0,083	0,095	0,107	0,119	0,148

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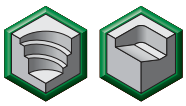
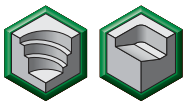


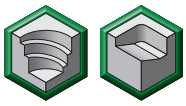
Helical Interpolation / Ramping 0° - 15°

Material Group		Max Depth	Cutting Speed — Vc m/min min	Start	max	UNCOATED Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping – fz x 1 Diameter – D1 [Ømin–Ømax] mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						mm	2,5-4,8	4,6-7,6	5,8-9,5	6,9-11,4	9,2-15,2	11,5-19,0	13,8-22,8	16,1-26,6	18,4-30,4	20,7-34,2	23,0-38,0	28,8-47,5
N	1	1,25 x D1	500	600	2000	fz	0,022	0,044	0,055	0,066	0,088	0,110	0,132	0,153	0,176	0,198	0,220	0,275
N	2	1,25 x D1	500	600	1500	fz	0,020	0,040	0,048	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247
N	3	1,25 x D1	500	600	1500	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
N	4	1,25 x D1	400	450	750	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
N	5	1,25 x D1	250	400	1000	fz	0,020	0,040	0,050	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247



Helical Interpolation / Ramping 15° - 30°

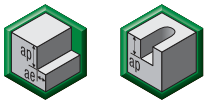
Material Group		Max Depth	Cutting Speed — Vc m/min min	Start	max	UNCOATED Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping – fz x 1 Diameter – D1 [Ømin–Ømax] mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						mm	2,5-4,8	4,6-7,6	5,8-9,5	6,9-11,4	9,2-15,2	11,5-19,0	13,8-22,8	16,1-26,6	18,4-30,4	20,7-34,2	23,0-38,0	28,8-47,5
N	1	1,25 x D1	500	600	1600	fz	0,017	0,033	0,041	0,050	0,066	0,082	0,099	0,115	0,132	0,148	0,165	0,206
N	2	1,25 x D1	500	600	1200	fz	0,015	0,030	0,036	0,045	0,059	0,074	0,089	0,104	0,119	0,134	0,148	0,185
N	3	1,25 x D1	500	600	1200	fz	0,012	0,023	0,029	0,035	0,046	0,058	0,069	0,080	0,092	0,104	0,115	0,144
N	4	1,25 x D1	400	450	600	fz	0,012	0,023	0,029	0,035	0,046	0,058	0,069	0,080	0,092	0,104	0,115	0,144
N	5	1,25 x D1	250	400	800	fz	0,015	0,030	0,038	0,045	0,059	0,074	0,089	0,104	0,119	0,134	0,148	0,185

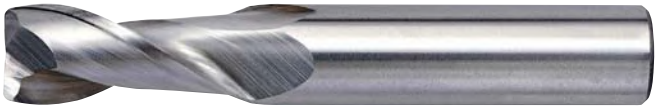


Helical Interpolation / Ramping 30° - 45°

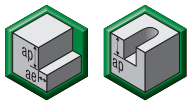
Material Group		Max Depth	Cutting Speed — Vc m/min min	Start	max	UNCOATED Recommended feed per tooth (fz = mm/z) for helical interpolation and ramping – fz x 1 Diameter – D1 [Ømin–Ømax] mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						mm	2,5-4,8	4,6-7,6	5,8-9,5	6,9-11,4	9,2-15,2	11,5-19,0	13,8-22,8	16,1-26,6	18,4-30,4	20,7-34,2	23,0-38,0	28,8-47,5
N	1	1,25 x D1	420	500	800	fz	0,013	0,026	0,033	0,040	0,053	0,066	0,079	0,092	0,106	0,119	0,132	0,165
N	2	1,25 x D1	420	500	800	fz	0,012	0,024	0,029	0,036	0,048	0,059	0,071	0,083	0,095	0,107	0,119	0,148
N	3	1,25 x D1	420	500	800	fz	0,009	0,018	0,023	0,028	0,037	0,046	0,055	0,064	0,074	0,083	0,092	0,115
N	4	1,25 x D1	340	380	450	fz	0,009	0,018	0,023	0,028	0,037	0,046	0,055	0,064	0,074	0,083	0,092	0,115
N	5	1,25 x D1	210	340	600	fz	0,012	0,024	0,030	0,036	0,048	0,059	0,071	0,083	0,095	0,107	0,119	0,148

ALUFLASH • Side Milling and Slotting • Application Data • Metric





Material Group		Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (fz = mm/z) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — Vc m/min				D1 — Diameter											
		ap	ae	ap	min	Start	max	mm	2,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
N	1	Ap1 max	0,5 x D1	1 x D	500	600	2000	fz	0,022	0,044	0,055	0,066	0,088	0,110	0,132	0,153	0,176	0,198	0,220	0,275
	2	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0,020	0,040	0,048	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247
	3	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
	4	Ap1 max	0,5 x D1	1 x D	400	450	750	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
	5	Ap1 max	0,5 x D1	1 x D	250	400	1000	fz	0,020	0,040	0,050	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247



Material Group		Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (fz = mm/z) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — Vc m/min				D1 — Diameter											
		ap	ae	ap	min	Start	max	mm	2,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
N	1	Ap1 max	0,5 x D1	1 x D	500	600	2000	fz	0,022	0,044	0,055	0,066	0,088	0,110	0,132	0,153	0,176	0,198	0,220	0,275
	2	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0,020	0,040	0,048	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247
	3	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
	4	Ap1 max	0,5 x D1	1 x D	400	450	750	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
	5	Ap1 max	0,5 x D1	1 x D	250	400	1000	fz	0,020	0,040	0,050	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247

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HANITA™

X-Feed™

High-Performance Solid End Milling

The X-Feed Solid End Mill is for machining companies looking for a reliable high-feed solution that can operate on all kind of steels with a hardness above 60 HRC or on heat-resistant alloys like titanium, INCONEL®, and stainless steels.

Features and Benefits

Low lead angle for high speed applications.

6 flute across the entire diameter range.

Long neck to reach the bottom of the deepest cavities.

Different Edge preparations to machine ISO P and H material or ISO S and M categories.

The X-Feed milling line will deliver high feed-rates in multiple applications, from hardened steels up to 60 HRC to the most demanding superalloys such as titanium or PH steels.

FAST

Constant 6-flute design to provide the high feed-rate on the entire diameter range.

LONG

With its 3 x D long neck, the X-Feed makes possible to machine deep cavities with ease.

VERSATILE

The X-Feed range includes different geometries to machine steels, hardened steels, plus stainless steel and superalloys.

HIGH SPEED

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
AlTiN	6

DIAMETER RANGE

METRIC
6–25mm

INDUSTRY

- GENERAL ENGINEERING
- AEROSPACE
- ENERGY
- TRANSPORTATION

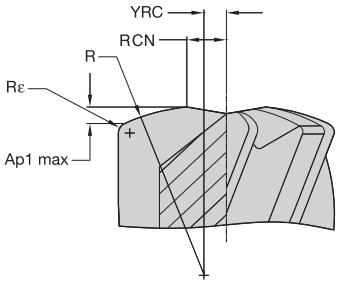
APPLICATIONS

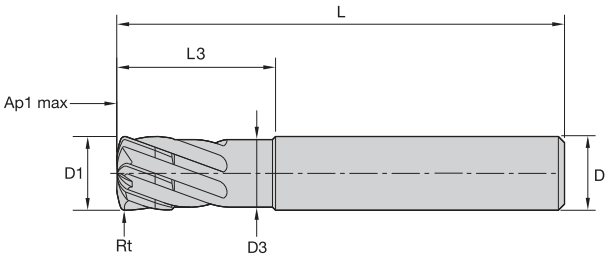
MATERIALS

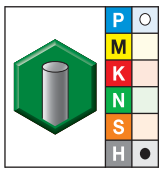
P M S H

- FACING
- RAMPING
- HELICAL INTERPOLATION
- SLOTTING
- 3D PROFILING
- PLUNGING

X-Feed • Series 70N6 71N6 • 37–52 HRC • High Feed • 6 Flute • Cylindrical Shank • Metric







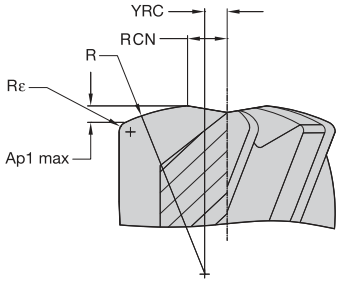
● first choice
○ alternate choice

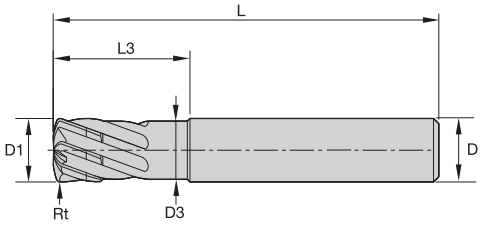
AlTiN-MT1

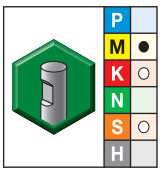
order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	Rt	Z U
3745400	71N606002MT	6,0	6	5,50	0,32	9,00	57	0,38	0,62	6
3341346	70N606002MT	6,0	6	5,50	0,32	18,00	63	0,38	0,62	6
3745401	71N608003MT	8,0	8	7,50	0,42	12,00	63	0,50	0,83	6
3341348	70N608003MT	8,0	8	7,50	0,42	24,00	76	0,50	0,83	6
3745402	71N610004MT	10,0	10	9,00	0,53	15,00	72	0,63	1,04	6
3101466	70N610004MT	10,0	10	9,00	0,53	30,00	89	0,63	1,04	6
3745413	71N612005MT	12,0	12	11,00	0,63	18,00	83	0,75	1,24	6
3101467	70N612005MT	12,0	12	11,00	0,63	36,00	100	0,75	1,24	6
3484748	70N616006MT	16,0	16	15,00	0,84	48,00	110	1,00	1,66	6
3484749	70N620007MT	20,0	20	19,00	1,05	60,00	125	1,25	2,07	6

NOTE: YRC = distance from center line to the crown of the R radius.
RCN = distance from center line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
R = the head radius size.
R⊠ = the shoulder radius or radius at the corner of the cutter.

X-Feed • Series 70NS • Stainless Steel/High-Temp • High Feed • 6 Flute • Cylindrical Shank • Metric







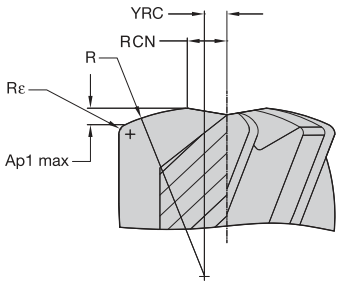
● first choice
○ alternate choice

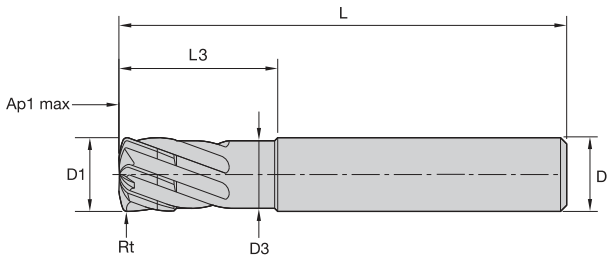
AlTiN-MT

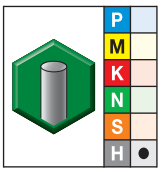
order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	Z U
6441882	70NS06002	6,0	6	5,50	0,32	17,75	63	0,38	6
6441883	70NS08003	8,0	8	7,50	0,42	23,75	76	0,50	6
6441884	70NS10004	10,0	10	9,00	0,53	29,50	89	0,63	6
6441885	70NS12005	12,0	12	11,00	0,63	35,50	100	0,75	6
6441886	70NS16006	16,0	16	15,00	0,84	47,50	110	1,00	6
6441887	70NS20007	20,0	20	19,00	1,05	59,50	125	1,25	6
6441888	70NS25008	25,0	25	23,50	1,31	74,25	150	1,56	6

NOTE: YRC = distance from center line to the crown of the R radius.
RCN = distance from center line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
R = the head radius size.
R⊠ = the shoulder radius or radius at the corner of the cutter.

X-Feed • Series 70N7 • >52 HRC • High Feed • 6 Flute • Cylindrical Shank • Metric







● first choice
○ alternate choice

AlTiN-MT1

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	Rt	Z U
3484756	70N706002MT	6,0	6	5,50	0,20	18,00	63	0,38	0,58	6
3484757	70N708003MT	8,0	8	7,50	0,27	24,00	76	0,50	0,77	6
3484758	70N710004MT	10,0	10	9,00	0,33	30,00	89	0,63	0,96	6
3403492	70N712005MT	12,0	12	11,00	0,40	36,00	100	0,75	1,15	6
3477329	70N716006MT	16,0	16	15,00	0,54	48,00	110	1,00	1,54	6
3484759	70N720007MT	20,0	20	19,00	0,67	60,00	125	1,25	1,92	6

NOTE: YRC = distance from center line to the crown of the R radius.
RCN = distance from center line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
R = the head radius size.
Rε = the shoulder radius or radius at the corner of the cutter.

X-Feed • Lists 70N6 71N6 • Application Data • AlTiN-MT1 • Metric

Material Group		Profile Milling		AlTiN			Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A)						
		A		Cutting Speed — vc m/min				D1 — Diameter					
		ap	ae	min		max	mm	6,0	8,0	10,0	12,0	16,0	20,0
P	4	0,05 x D	0,55 x D	160	–	180	fz	0,300	0,500	0,500	0,500	0,600	0,700
H	1	0,05 x D	0,55 x D	140	–	160	fz	0,300	0,500	0,500	0,500	0,600	0,700
	2	0,05 x D	0,55 x D	100	–	120	fz	0,200	0,300	0,300	0,400	0,500	0,600

Tool List 70N6																	
Geometrical Parameters											Ramping Guide for Circular and Linear Interpolation						
											Circular Interpolation		Linear Interpolation				
											Allowed Range of Hole Diameter		Calculated Length (mm) per Ramp Angle				
Tool	diameter	ap max	Rfm	Rt	Rc	Xfm	Yfm	YD	Number				Ramp Angle (degree)				
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	flutes		Smallest	Largest	1	2	3	4	5
70N606003MT	6	0,32	6	0,62	0,375	0,32	0,75	1,32	6		8,64	12	18,12	9,06	6,03	4,52	3,61
70N608003MT	8	0,42	8	0,83	0,500	0,42	1,00	1,76	6		11,52	16	24,16	12,08	8,05	6,03	4,82
70N610004MT	10	0,53	10	1,04	0,625	0,53	1,25	2,20	6		14,4	20	30,20	15,09	10,06	7,54	6,02
70N612005MT	12	0,63	12	1,24	0,750	0,63	1,50	2,64	6		17,28	24	36,24	18,11	12,07	9,05	7,23
70N616006MT	16	0,84	16	1,66	1,000	0,84	2,00	3,52	6		23,04	32	48,31	24,15	16,09	12,06	9,64
70N620007MT	20	1,05	20	2,07	1,250	1,05	2,50	4,40	6		28,8	40	60,39	30,19	20,11	15,08	12,05
													100%	70%	50%	30%	10%

NOTE: Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters on diameters >12mm.

HANITA

X-Feed • Series 70NS • Application Data • AlTiN-MT • Metric

Material Group		Profile Milling A ap	ae	AlTiN-MT Cutting Speed — Vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0	25,0
M	1	0,05 x D	0,55 x D	90	–	115	fz	0,300	0,400	0,500	0,540	0,720	0,900	1,125
	2	0,05 x D	0,55 x D	60	–	80	fz	0,240	0,320	0,400	0,480	0,640	0,800	1,000
	3	0,05 x D	0,55 x D	60	–	70	fz	0,240	0,320	0,400	0,480	0,640	0,800	1,000
S	1	0,05 x D	0,55 x D	50	–	90	fz	0,270	0,360	0,450	0,500	0,650	0,800	1,000
	2	0,05 x D	0,55 x D	25	–	40	fz	0,240	0,320	0,400	0,480	0,600	0,700	0,900
	3	0,05 x D	0,55 x D	25	–	40	fz	0,180	0,240	0,300	0,350	0,430	0,500	0,600
	4	0,05 x D	0,55 x D	50	–	60	fz	0,210	0,280	0,350	0,420	0,560	0,700	0,875

70NS Metric															
Geometrical Parameters									Ramping Guide for Circular and Linear Interpolation						
									Circular Interpolation		Linear Interpolation				
									Allowed Range of Hole Diameter		Calculated Length (mm) per Ramp Angle				
diameter	Ap1 max	Rfm	Rt	Rc	Xfm	Yfm	YD	Number			Ramp Angle (degree)				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	flutes	Smallest	Largest	1	2	3	4	5
6	0,32	6	0,67	0,375	0,338	0,75	1,26	6	8,52	12	18,12	9,06	6,03	4,52	3,61
8	0,42	8	0,89	0,500	0,450	1,00	1,68	6	11,36	16	24,16	12,08	8,05	6,03	4,82
10	0,53	10	1,12	0,625	0,562	1,25	2,10	6	14,2	20	30,20	15,09	10,06	7,54	6,02
12	0,63	12	1,34	0,750	0,674	1,50	2,52	6	17,04	24	36,24	18,11	12,07	9,05	7,23
16	0,84	16	1,79	1,000	0,915	2,00	3,36	6	22,72	32	48,31	24,15	16,09	12,06	9,64
20	1,05	20	2,23	1,250	1,124	2,50	4,20	6	28,4	40	60,39	30,19	20,11	15,08	12,05
25	1,25	25	2,90	1,5625	1,405	3,1250	5,25	6	35,5	50	70,61	35,80	23,85	17,88	14,29
Recommended Feed											30%	30%	30%	30%	10%

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

X-Feed • Series 70N7 • Application Data • AlTiN-MT1 • Metric

Material Group		Profile Milling A ap	ae	AlTiN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0
H	2	0,03 x D	0,55 x D	100	–	120	fz	0,200	0,300	0,300	0,400	0,500	0,600
	3	0,03 x D	0,55 x D	80	–	100	fz	0,200	0,300	0,300	0,400	0,500	0,600
	4	0,03 x D	0,55 x D	50	–	70	fz	0,150	0,200	0,250	0,300	0,400	0,500

Tool List 70N7															
Geometrical Parameters									Ramping Guide for Circular and Linear Interpolation						
									Circular Interpolation		Linear Interpolation				
									Allowed Range of Hole Diameter		Calculated Length (mm) per Ramp Angle				
diameter	Ap1 max	Rfm	Rt	Rc	Xfm	Yfm	YD	Number			Ramp Angle (degree)				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	flutes	Smallest	Largest	1	2	3	4	5
6	0,20	9	0,58	0,375	0,20	0,75	1,26	6	8,52	12	11,51	5,75	3,83	2,87	2,30
8	0,27	12	0,77	0,500	0,27	1,00	1,68	6	11,36	16	15,34	7,67	5,11	3,83	3,06
10	0,33	15	0,96	0,625	0,33	1,25	2,10	6	14,2	20	19,18	9,58	6,39	4,79	3,83
12	0,40	18	1,15	0,750	0,40	1,50	2,52	6	17,04	24	23,01	11,50	7,66	5,74	4,59
16	0,54	24	1,54	1,000	0,54	2,00	3,36	6	22,72	32	30,68	15,34	10,22	7,66	6,12
20	0,67	30	1,92	1,250	0,67	2,50	4,20	6	28,4	40	38,35	19,17	12,77	9,57	7,65
Recommended Feed											100%	70%	50%	30%	10%

NOTE: Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

Vision Plus™

High-Performance Solid End Milling

Vision Plus end mills are focused on delivering productivity in primarily the die and mold industry, in roughing or finishing operations for hardened steel up to 67 HRC.

Features and Benefits

Negative rakes to make the cutting edge robust.

High helix angles to reduce chip thickness and guarantee wall straightness in finishing operations.

Specific substrate engineered to perform on high hardness steels.

The Vision Plus series offers a variety of tools to machine the most complex components including various end face geometries.

ROBUST

Dedicated design to attack all types of hardened steels up to 67 HRC.

SPECIFIC

Specifically engineered design to compete in the die and mold industry, in all applications on hardened steels and high alloyed steels.

PRODUCTIVE

Vision Plus end mills include geometries and edge preparations designed to increase feed-rates and achieve higher metal removal rates.

HARD MACHINING MADE EASY

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
WU10PE AlTiN	2–6

DIAMETER RANGE

METRIC
0,3–25mm

INDUSTRY

GENERAL ENGINEERING

APPLICATIONS

MATERIALS

P H

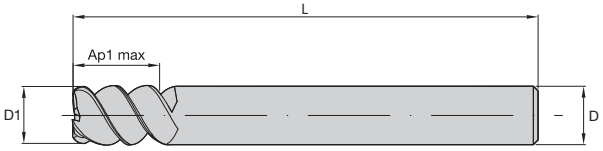
SIDE MILLING

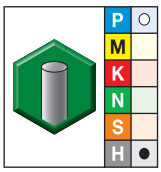
3D PROFILING

HELICAL INTERPOLATION

RAMPING

Vision Plus • Series 7505 7515 7525 7545 • Sharp Edge • Cylindrical Shank • Metric



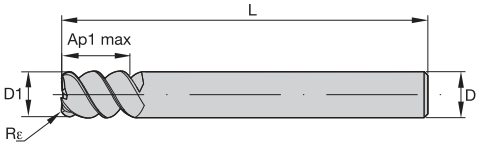


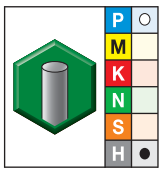
● first choice
○ alternate choice

TiAlN-LT1

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
2499570	754503002LT	3,0	6	4,50	50	4
2499567	750503002LT	3,0	6	4,50	57	4
2499571	754504002LT	4,0	6	6,00	50	4
2499568	750504002LT	4,0	6	6,00	57	4
2499572	754505002LT	5,0	6	7,50	50	4
2499569	750505002LT	5,0	6	7,50	76	4
1848805	754506002LT	6,0	6	9,00	50	4
1724462	750506002LT	6,0	6	9,00	76	4
1724468	751506002LT	6,0	6	15,00	76	4
1724487	752506002LT	6,0	6	21,00	76	4
1860603	754508003LT	8,0	8	12,00	63	4
1724463	750508003LT	8,0	8	12,00	100	4
1724469	751508003LT	8,0	8	20,00	100	4
1724489	752508003LT	8,0	8	28,00	100	4
1860604	754510004LT	10,0	10	15,00	76	4
1724464	750510004LT	10,0	10	15,00	100	4
1724481	751510004LT	10,0	10	25,00	100	5
1724490	752510004LT	10,0	10	35,00	100	5
1860605	754512005LT	12,0	12	18,00	76	4
1724465	750512005LT	12,0	12	18,00	125	4
1724482	751512005LT	12,0	12	30,00	125	6
1724531	752512005LT	12,0	12	42,00	125	6
1860606	754516006LT	16,0	16	24,00	89	4
1724483	751516006LT	16,0	16	40,00	125	6
1724533	752516006LT	16,0	16	56,00	125	6
1724484	751520007LT	20,0	20	50,00	150	6
1724536	752520007LT	20,0	20	70,00	150	6
1747878	751525008LT	25,0	25	63,00	150	6
1747931	752525008LT	25,0	25	88,00	150	6

Vision Plus • Series 7585 7595 • Radius • Cylindrical Shank • Metric



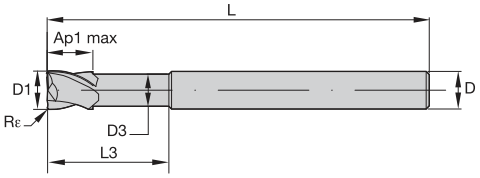


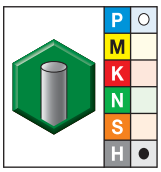
● first choice
○ alternate choice

TiAlN-LT1

order #	catalogue #	D1	D	length of cut Ap1 max	length L	Rε	ZU
2540317	759503002LT	3,0	6	4,50	50	0,25	4
2540318	759503012LT	3,0	6	4,50	50	0,50	4
2540319	759504002LT	4,0	6	6,00	50	0,25	4
2540320	759504012LT	4,0	6	6,00	50	0,50	4
2540321	759505002LT	5,0	6	7,50	50	0,25	4
2540322	759505012LT	5,0	6	7,50	50	0,50	4
1862105	759506002LT	6,0	6	9,00	50	0,25	4
1862106	759506012LT	6,0	6	9,00	50	0,50	4
2541273	759506022LT	6,0	6	9,00	50	0,75	4
2541274	759506032LT	6,0	6	9,00	50	1,00	4
1860609	758506002LT	6,0	6	9,00	76	0,25	4
1860610	758506012LT	6,0	6	9,00	76	0,50	4
1862107	759508003LT	8,0	8	12,00	63	0,50	4
2541275	759508023LT	8,0	8	12,00	63	0,75	4
1862108	759508013LT	8,0	8	12,00	63	1,00	4
2541276	759508033LT	8,0	8	12,00	63	1,50	4
1860611	758508003LT	8,0	8	12,00	100	0,50	4
1860612	758508013LT	8,0	8	12,00	100	1,00	4
1862109	759510004LT	10,0	10	15,00	76	0,50	4
1862110	759510014LT	10,0	10	15,00	76	1,00	4
2541277	759510024LT	10,0	10	15,00	76	1,50	4
2541278	759510034LT	10,0	10	15,00	76	2,00	4
1860623	758510004LT	10,0	10	15,00	100	0,50	4
1860624	758510014LT	10,0	10	15,00	100	1,00	4
1862111	759512005LT	12,0	12	18,00	76	0,50	4
2541279	759512025LT	12,0	12	18,00	76	1,00	4
2541280	759512035LT	12,0	12	18,00	76	2,00	4
1860625	758512005LT	12,0	12	18,00	125	0,50	4
1862113	759516006LT	16,0	16	24,00	89	0,50	4
1860628	758516016LT	16,0	16	24,00	125	1,50	4
2541293	759520027LT	20,0	20	30,00	104	1,00	4

Vision Plus • Series 75N2 • Radius • Cylindrical Shank • Metric



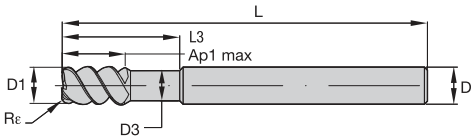


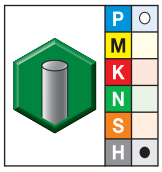
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
2544530	75N203022RT	3,0	6	2,80	3,00	9,00	75	0,30	2
2544737	75N204022RT	4,0	6	3,70	4,00	12,00	75	0,30	2
2545166	75N206062RT	6,0	6	5,50	6,00	18,00	75	1,00	2

Vision Plus • Series 75N5 • Neck • Cylindrical Shank • Metric



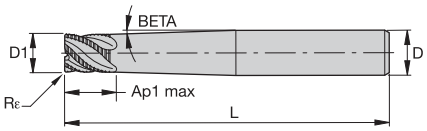


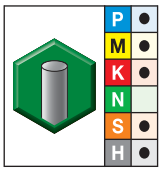
● first choice
○ alternate choice

TiAlN-LT1

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU
2544367	75N503022LT	3,0	6	2,7	4,50	9,00	57	0,25	4
2544368	75N503042LT	3,0	6	2,7	4,50	9,00	57	0,50	4
2544369	75N504022LT	4,0	6	3,7	6,00	12,00	57	0,25	4
2544370	75N504042LT	4,0	6	3,7	6,00	12,00	57	0,50	4
2544371	75N505022LT	5,0	6	4,6	7,50	15,00	76	0,25	4
2544372	75N505042LT	5,0	6	4,6	7,50	15,00	76	0,50	4
1862119	75N506002LT	6,0	6	5,4	9,00	18,00	76	–	4
2544443	75N506022LT	6,0	6	5,4	9,00	18,00	76	0,25	4
2544444	75N506042LT	6,0	6	5,4	9,00	18,00	76	0,50	4
2544446	75N506082LT	6,0	6	5,4	9,00	18,00	76	1,00	4
1862120	75N508003LT	8,0	8	7,4	12,00	24,00	100	–	4
2544447	75N508023LT	8,0	8	7,4	12,00	24,00	100	0,50	4
2544448	75N508033LT	8,0	8	7,4	12,00	24,00	100	1,00	4
2544449	75N508043LT	8,0	8	7,4	12,00	24,00	100	1,50	4
2544450	75N508053LT	8,0	8	7,4	12,00	24,00	100	2,00	4
1862121	75N510004LT	10,0	10	9,4	15,00	30,00	100	–	4
2544452	75N510024LT	10,0	10	9,2	15,00	30,00	100	0,50	4
2544483	75N510034LT	10,0	10	9,2	15,00	30,00	100	1,00	4
2544484	75N510044LT	10,0	10	9,2	15,00	30,00	100	1,50	4
2544485	75N510054LT	10,0	10	9,2	15,00	30,00	100	2,00	4
1862122	75N512005LT	12,0	12	11,4	18,00	36,00	125	–	4
2544486	75N512025LT	12,0	12	11,0	18,00	36,00	125	0,50	4
2544487	75N512035LT	12,0	12	11,0	18,00	36,00	125	1,00	4
2544489	75N512055LT	12,0	12	11,0	18,00	36,00	125	2,00	4
1862123	75N516006LT	16,0	16	15,4	24,00	48,00	125	–	4
2544490	75N516026LT	16,0	16	15,0	24,00	48,00	125	0,50	4
1862124	75N520007LT	20,0	20	19,4	30,00	60,00	150	–	4
2544523	75N520047LT	20,0	20	19,0	30,00	60,00	150	2,00	4

Vision Plus • Series 7670 • Radius • Cylindrical Shank • Metric



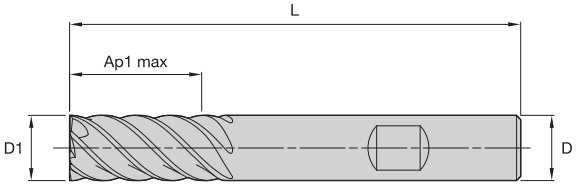


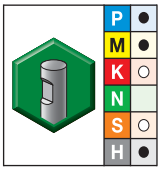
● first choice
○ alternate choice

TiAlN-LT1

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	Rε	ZU
1724621	767016006LT	16,0	16	15,00	16,00	125	1,00	6

Vision Plus • Series D518 • Sharp Edge • Weldon® • Metric



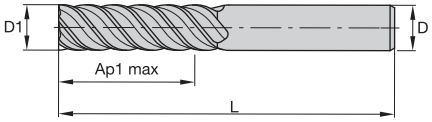


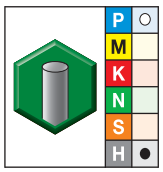
● first choice
○ alternate choice

WP15PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
5559116	D51804002W	4,0	6	11,00	57	4
5559117	D51805002W	5,0	6	13,00	57	4
5559118	D51806002W	6,0	6	13,00	57	6
5559120	D51808003W	8,0	8	19,00	63	6
5559122	D51810004W	10,0	10	22,00	72	6
5559123	D51812005W	12,0	12	26,00	83	6
5559124	D51814014W	14,0	14	26,00	83	6
5559125	D51816006W	16,0	16	32,00	92	8
5559127	D51820007W	20,0	20	38,00	104	8
5559128	D51825008W	25,0	25	45,00	121	8

Vision Plus • Series D618 • Sharp Edge • Cylindrical Shank • Metric



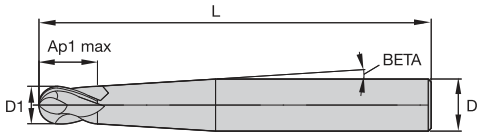


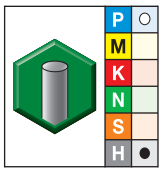
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
2256338	D61803002RJ	3,0	4	8,00	50	4
2257304	D61804002RJ	4,0	6	12,00	57	4
2256340	D61805002RJ	5,0	6	13,00	57	4
2256341	D61806002RJ	6,0	6	15,00	60	6
2256353	D61808003RJ	8,0	8	20,00	75	6
2256354	D61810004RJ	10,0	10	25,00	80	6
2256355	D61812005RJ	12,0	12	30,00	100	6
2256356	D61816006RJ	16,0	16	40,00	110	6
2256357	D61820007RJ	20,0	20	45,00	120	6

Vision Plus • Series 7050 7060 • Ball Nose • Cylindrical Shank • Metric



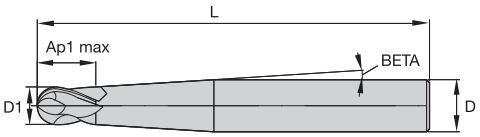


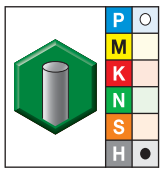
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BETA	ZU
1724321	705002001RT	2,0	4	2,00	63	2.5	4
1724323	705003002RT	3,0	6	3,00	75	2.5	4
1724324	705004002RT	4,0	6	4,00	75	2.5	4
2495916	706004002RT	4,0	6	4,00	75	1.5	4
1724325	705005002RT	5,0	6	5,00	75	2.5	4
1724326	705006004RT	6,0	10	6,00	100	2.5	4
2495918	706006004RT	6,0	10	6,00	100	1.5	4
1724327	705008004RT	8,0	10	8,00	100	2.5	4
1724328	705010005RT	10,0	12	10,00	125	2.5	4
1724330	705016006RT	16,0	16	16,00	125	–	4

Vision Plus • Series 7061 • Ball Nose • Cylindrical Shank • Metric



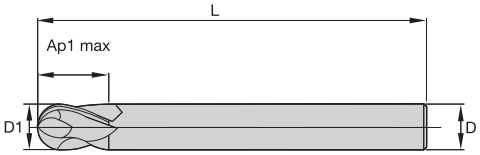


● first choice
○ alternate choice

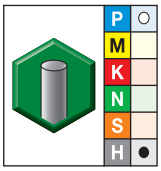
WU10PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	BETA	ZU
2495994	706101001RT	1,0	4	1,00	63	3.5	2
2495995	706102001RT	2,0	4	2,00	63	3.5	2
2495997	706103002RT	3,0	6	3,00	75	1.5	2
2495998	706104002RT	4,0	6	4,00	75	1.5	2
2496000	706106004RT	6,0	10	6,00	100	1.5	2
2496001	706108004RT	8,0	10	8,00	100	1.5	2

Vision Plus • Series 7150 • Ball Nose • Cylindrical Shank • Metric



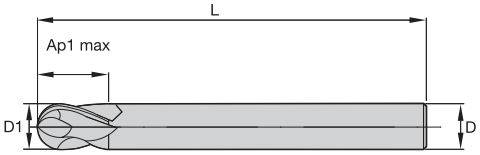
● first choice
○ alternate choice

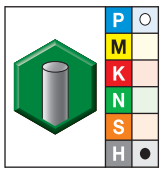


WU10PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
1859882	715003000RT	3,0	3	3,00	38	4
1859904	715004001RT	4,0	4	4,00	50	4
1859906	715005001RT	5,0	5	5,00	50	4
1859907	715006002RT	6,0	6	6,00	50	4
1859908	715008003RT	8,0	8	8,00	63	4
1859909	715010004RT	10,0	10	10,00	76	4
1859910	715012005RT	12,0	12	12,00	76	4

Vision Plus • Series 7151 • Ball Nose • Cylindrical Shank • Metric



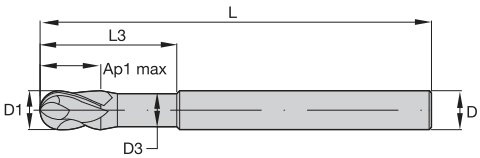


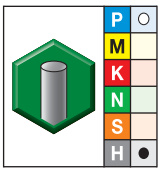
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
1860036	715101000RT	1,0	3	3,00	38	2
1860090	715102000RT	2,0	3	3,00	38	2
1860106	715103000RT	3,0	3	3,00	38	2
1860109	715104001RT	4,0	4	4,00	50	2
1860111	715105001RT	5,0	5	5,00	50	2
1860112	715106002RT	6,0	6	6,00	50	2
1860133	715108003RT	8,0	8	8,00	63	2
1860134	715110004RT	10,0	10	10,00	76	2
1860135	715112005RT	12,0	12	12,00	76	2

Vision Plus • Series 70N1 • Ball Nose • Neck • Cylindrical Shank • Metric



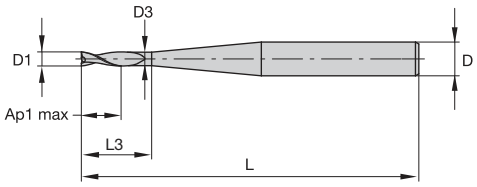


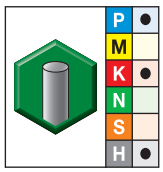
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	length L	ZU
2545190	70N101001RT	1,0	4	0,80	1,00	63	2
2545191	70N101501RT	1,5	4	1,30	1,50	63	2
2545192	70N102002RT	2,0	6	1,80	2,00	76	2
2545213	70N103002RT	3,0	6	2,80	3,00	76	2
2545214	70N104002RT	4,0	6	3,70	4,00	76	2
2545215	70N105002RT	5,0	6	4,60	5,00	76	2
2545216	70N106002RT	6,0	6	5,50	6,00	76	2
2545217	70N108003RT	8,0	8	7,50	8,00	100	2
2545218	70N110004RT	10,0	10	9,50	10,00	100	2
2545219	70N112005RT	12,0	12	11,50	12,00	125	2

Vision Plus Micro • Series 7N02 7N12 7N22 • Sharp Edge • Cylindrical Shank • Metric





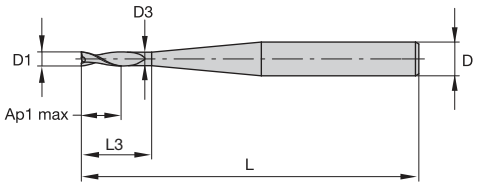
● first choice
○ alternate choice

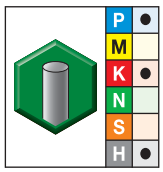
WU10PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	ZU
2256390	7N0200302RJ	0,3	6	0,24	0,40	0,40	50	2
2256438	7N2200400RJ	0,4	3	0,34	0,60	2,00	38	2
2256439	7N2200410RJ	0,4	3	0,34	0,60	4,00	38	2
2256391	7N0200402RJ	0,4	6	0,34	0,60	0,60	50	2
2256440	7N2200500RJ	0,5	3	0,44	0,70	2,00	38	2
2256441	7N2200510RJ	0,5	3	0,44	0,70	4,00	38	2
2256442	7N2200520RJ	0,5	3	0,44	0,70	6,00	38	2
2256392	7N0200502RJ	0,5	6	0,44	0,70	1,50	50	2
2256443	7N2200600RJ	0,6	3	0,54	0,90	2,00	38	2
2256444	7N2200610RJ	0,6	3	0,54	0,90	4,00	38	2
2256445	7N2200620RJ	0,6	3	0,54	0,90	6,00	38	2
2256393	7N0200602RJ	0,6	6	0,54	0,90	1,80	50	2
2256447	7N2200711RJ	0,7	4	0,64	1,00	4,00	50	2
2256448	7N2200721RJ	0,7	4	0,64	1,00	6,00	50	2
2256449	7N2200801RJ	0,8	4	0,74	1,20	4,00	50	2
2256450	7N2200811RJ	0,8	4	0,74	1,20	6,00	50	2
2256451	7N2200821RJ	0,8	4	0,74	1,20	8,00	50	2
2256394	7N0200802RJ	0,8	6	0,74	1,20	2,40	50	2
2256455	7N2201001RJ	1,0	4	0,94	1,50	6,00	50	2
2256456	7N2201011RJ	1,0	4	0,94	1,50	8,00	50	2
2256457	7N2201021RJ	1,0	4	0,94	1,50	10,00	50	2
2256458	7N2201031RJ	1,0	4	0,94	1,50	12,00	50	2
2256395	7N0201002RJ	1,0	6	0,94	1,50	2,50	50	2
2256406	7N1201002RJ	1,0	6	0,94	1,50	5,00	60	2
2256459	7N2201201RJ	1,2	4	1,14	1,50	6,00	50	2
2256460	7N2201211RJ	1,2	4	1,14	1,80	8,00	50	2
2256462	7N2201231RJ	1,2	4	1,14	1,80	12,00	50	2
2256396	7N0201202RJ	1,2	6	1,14	1,80	3,00	50	2
2256407	7N1201202RJ	1,2	6	1,14	1,80	6,00	60	2
2256463	7N2201401RJ	1,4	4	1,34	2,10	6,00	50	2
2256464	7N2201411RJ	1,4	4	1,34	2,10	8,00	50	2
2256465	7N2201421RJ	1,4	4	1,35	2,10	10,00	50	2
2256467	7N2201441RJ	1,4	4	1,34	2,10	16,00	50	2
2256397	7N0201402RJ	1,4	6	1,34	2,10	3,50	50	2
2256468	7N2201501RJ	1,5	4	1,44	2,30	6,00	50	2
2256469	7N2201511RJ	1,5	4	1,44	2,30	10,00	50	2
2256470	7N2201521RJ	1,5	4	1,44	2,30	12,00	50	2
2256471	7N2201531RJ	1,5	4	1,44	2,30	16,00	50	2
2256472	7N2201541RJ	1,5	4	1,44	2,30	18,00	63	2
2256473	7N2201551RJ	1,5	4	1,44	2,30	20,00	63	2
2256398	7N0201502RJ	1,5	6	1,44	2,30	3,80	50	2
2256409	7N1201502RJ	1,5	6	1,44	2,30	7,50	60	2
3454428	7N2201571RJ	1,6	4	1,54	2,80	11,70	50	2
2256479	7N2201701RJ	1,7	4	1,64	2,60	6,00	50	2
2256481	7N2201721RJ	1,7	4	1,64	2,60	12,00	50	2
2256484	7N2201801RJ	1,8	4	1,74	2,70	6,00	50	2
2256485	7N2201811RJ	1,8	4	1,74	2,70	10,00	50	2
2256486	7N2201821RJ	1,8	4	1,74	2,70	12,00	50	2
2256487	7N2201831RJ	1,8	4	1,74	2,70	16,00	50	2
2256400	7N0201802RJ	1,8	6	1,74	2,70	4,50	50	2
2256489	7N2201901RJ	1,9	4	1,84	2,80	6,00	50	2
2256494	7N2202001RJ	2,0	4	1,96	3,00	6,00	50	2

Vision Plus Micro • Series 7N02 7N12 7N22 • Sharp Edge • Cylindrical Shank • Metric

(continued)



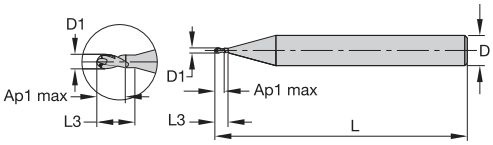


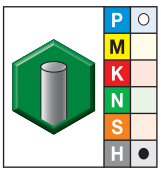
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	ZU
2256495	7N2202011RJ	2,0	4	1,96	3,00	10,00	50	2
2256496	7N2202021RJ	2,0	4	1,96	3,00	16,00	50	2
2256497	7N2202031RJ	2,0	4	1,96	3,00	20,00	63	2
2256498	7N2202041RJ	2,0	4	1,96	3,00	20,00	75	2
2256401	7N0202002RJ	2,0	6	1,94	3,00	5,00	50	2
2256412	7N1202002RJ	2,0	6	1,96	3,00	10,00	60	2
3454429	7N2202051RJ	2,1	4	2,00	3,00	8,00	50	2
2256499	7N2202501RJ	2,5	4	2,40	3,70	8,00	50	2
2256500	7N2202511RJ	2,5	4	2,40	3,70	10,00	50	2
2256501	7N2202521RJ	2,5	4	2,44	3,70	16,00	63	2
2256502	7N2202531RJ	2,5	4	2,44	3,70	20,00	63	2
2256503	7N2202541RJ	2,5	4	2,44	3,70	30,00	80	2
2256402	7N0202502RJ	2,5	6	2,44	3,70	5,00	50	2
2256504	7N2203002RJ	3,0	6	2,94	4,50	8,00	50	2
2256505	7N2203012RJ	3,0	6	2,94	4,50	10,00	50	2
2256506	7N2203022RJ	3,0	6	2,94	4,50	16,00	63	2
2256507	7N2203032RJ	3,0	6	2,94	4,50	20,00	63	2
2256508	7N2203042RJ	3,0	6	2,94	4,50	20,00	80	2
3454434	7N2203062RJ	3,1	6	3,00	4,50	25,00	76	2

Vision Plus Micro • Series 7N01 • Ball Nose • Cylindrical Shank • Metric



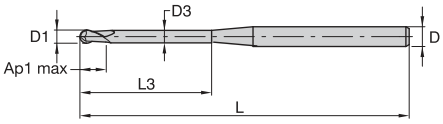


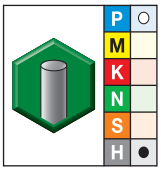
● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	length of cut Ap1 max	length L	ZU
2256358	7N0100302RJ	0,3	6	0,30	50	2
2256359	7N0100402RJ	0,4	6	0,40	50	2
2256360	7N0100502RJ	0,5	6	0,50	50	2
2256361	7N0100602RJ	0,6	6	0,60	50	2
2256362	7N0100802RJ	0,8	6	0,80	50	2
2256363	7N0101002RJ	1,0	6	2,50	50	2
2256364	7N0101202RJ	1,2	6	1,20	50	2
2256366	7N0101502RJ	1,5	6	1,50	50	2
2256369	7N0102002RJ	2,0	6	2,00	50	2
2256370	7N0102502RJ	2,5	6	2,50	50	2
2256371	7N0103002RJ	3,0	6	3,00	50	2
2256372	7N0104002RJ	4,0	6	4,00	50	2
2256373	7N0106002RJ	6,0	6	6,00	50	2

Vision Plus Micro • Series 7N21 • Ball Nose • Cylindrical Shank • Metric





● first choice
○ alternate choice

WU10PE

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	ZU
3665122	7N2100501RT	0,5	4	0,44	1,00	5,00	63	2
3665141	7N2100801RT	0,8	4	0,74	1,30	8,00	63	2
3665142	7N2101001RT	1,0	4	0,94	1,60	10,00	63	2
3665164	7N2101501RT	1,5	4	1,44	2,40	16,00	63	2
3665166	7N2102001RT	2,0	4	1,94	3,20	20,00	63	2
3665168	7N2103001RT	3,0	4	2,90	4,50	30,00	63	2

Vision Plus • Series 7505 7545 7515 7525 • Application Data • TiAlN-LT1 • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	3	1 x D	0,4 x D	1 x D	120	–	160	fz	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
P	4	1 x D	0,4 x D	0,75 x D	90	–	150	fz	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
H	1	1 x D	0,4 x D	0,75 x D	80	–	140	fz	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
H	2	1 x D	0,3 x D	0,5 x D	70	–	120	fz	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
H	3	1 x D	0,15 x D	0,3 x D	60	–	90	fz	0,014	0,018	0,021	0,029	0,035	0,041	0,046	0,051	0,055	0,059	0,067
H	4	1 x D	0,1 x D	0,15 x D	50	–	70	fz	0,009	0,012	0,014	0,019	0,023	0,027	0,031	0,034	0,037	0,039	0,044

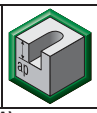
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

Vision Plus • Series 7515 • Application Data • TiAlN-LT1 • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0	
P	3	2 x D	0,3 x D	0,75 x D	160	–	180	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,096	0,111	0,125	
P	4	2 x D	0,25 x D	0,5 x D	140	–	160	fz	0,017	0,024	0,030	0,036	0,049	0,059	0,069	0,084	0,097	0,107	
H	1	2 x D	0,25 x D	0,5 x D	120	–	140	fz	0,017	0,024	0,030	0,036	0,049	0,059	0,069	0,084	0,097	0,107	
H	2	2 x D	0,2 x D	0,4 x D	80	–	130	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,063	0,071	0,078	
H	3	2 x D	0,1 x D	0,2 x D	70	–	100	fz	0,010	0,014	0,018	0,021	0,029	0,035	0,041	0,051	0,059	0,067	
H	4	2 x D	0,05 x D	0,05 x D	50	–	70	fz	0,007	0,009	0,012	0,014	0,019	0,023	0,027	0,034	0,039	0,044	

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

Vision Plus • Series 7525 • Application Data • TiAlN-LT1 • Metric



Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0	
P	3	3 x D	0,2 x D	0,5 x D	160	–	180	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,096	0,111	0,125	
P	4	3 x D	0,2 x D	0,3 x D	140	–	160	fz	0,017	0,024	0,030	0,036	0,049	0,059	0,069	0,084	0,097	0,107	
H	1	3 x D	0,2 x D	0,3 x D	120	–	140	fz	0,017	0,024	0,030	0,036	0,049	0,059	0,069	0,084	0,097	0,107	
H	2	3 x D	0,15 x D	0,2 x D	80	–	130	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,063	0,071	0,078	
H	3	3 x D	0,05 x D	–	70	–	100	fz	0,010	0,014	0,018	0,021	0,029	0,035	0,041	0,051	0,059	0,067	
H	4	3 x D	0,03 x D	–	50	–	70	fz	0,007	0,009	0,012	0,014	0,019	0,023	0,027	0,034	0,039	0,044	

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

Vision Plus • Series 7585 7595 • Application Data • TiAlN-LT1 • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	3	1 x D	0,4 x D	1 x D	120	–	160	fz	0,019	0,033	0,040	0,055	0,067	0,077	0,077	0,096	0,096	0,111	0,125
P	4	1 x D	0,4 x D	0,75 x D	90	–	150	fz	0,017	0,030	0,036	0,049	0,059	0,069	0,069	0,084	0,084	0,097	0,107
H	1	1 x D	0,4 x D	0,75 x D	80	–	140	fz	0,017	0,030	0,036	0,049	0,059	0,069	0,069	0,084	0,084	0,097	0,107
H	2	1 x D	0,3 x D	0,5 x D	70	–	120	fz	0,013	0,022	0,027	0,037	0,044	0,051	0,051	0,063	0,063	0,071	0,078
H	3	1 x D	0,15 x D	0,3 x D	60	–	90	fz	0,010	0,018	0,021	0,029	0,035	0,041	0,041	0,051	0,051	0,059	0,067
H	4	1 x D	0,1 x D	0,15 x D	50	–	70	fz	0,007	0,012	0,014	0,019	0,023	0,027	0,027	0,034	0,034	0,039	0,044

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

Vision Plus • Series 75N2 • Application Data • WU10PE • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	3	0,75 x D	0,1 x D	0,4 x D	160	–	180	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070
P	4	0,75 x D	0,1 x D	0,4 x D	140	–	160	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062
H	1	0,75 x D	0,1 x D	0,4 x D	120	–	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062
H	2	0,75 x D	0,05 x D	0,3 x D	100	–	130	fz	0,016	0,020	0,025	0,029	0,034	0,037	0,040
H	3	0,75 x D	0,03 x D	0,2 x D	70	–	100	fz	0,013	0,016	0,019	0,023	0,026	0,029	0,032
H	4	0,75 x D	0,01 x D	0,1 x D	50	–	70	fz	0,008	0,011	0,013	0,015	0,018	0,019	0,021

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Vision Plus • Series 75N2 • Application Data • TiAlN-LT1 • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc SFM min		max	Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%. mm	D1 — Diameter 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	3	0.75 x D	0.1 x D	0.4 x D	390	–	520	IPT	.0007	.0009	.0012	.0014	.0020	.0024	.0028	.0031	.0034	.0037	.0040	.0045
P	4	0.75 x D	0.1 x D	0.4 x D	300	–	490	IPT	.0006	.0008	.0011	.0013	.0018	.0021	.0025	.0028	.0030	.0033	.0035	.0038
H	1	0.75 x D	0.1 x D	0.4 x D	260	–	460	IPT	.0006	.0008	.0011	.0013	.0018	.0021	.0025	.0028	.0030	.0033	.0035	.0038
H	2	0.75 x D	0.05 x D	0.3 x D	230	–	390	IPT	.0005	.0006	.0008	.0010	.0013	.0016	.0018	.0021	.0022	.0024	.0026	.0028
H	3	0.75 x D	0.03 x D	0.2 X D	200	–	300	IPT	.0004	.0005	.0006	.0008	.0010	.0013	.0015	.0017	.0018	.0020	.0021	.0024
H	4	0.75 x D	0.01 x D	0.1 x D	160	–	230	IPT	.0002	.0003	.0004	.0005	.0007	.0008	.0010	.0011	.0012	.0013	.0014	.0016

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Vision Plus • Series 75N5 Finishing • Application Data • WU10PE • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		A		B	Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	ap	min		max	mm	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	3	1 x D	0,4 x D	1 x D	120	–	160	fz	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0.,104	0,111	0,125
	4	1 x D	0,4 x D	0,75 x D	90	–	150	fz	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
H	1	1 x D	0,4 x D	0,75 x D	80	–	140	fz	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	2	1 x D	0,3 x D	0,5 x D	70	–	120	fz	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
	3	1 x D	0,15 x D	0,3 x D	60	–	90	fz	0,014	0,018	0,021	0,029	0,035	0,041	0,046	0,051	0,055	0,059	0,067
	4	1 x D	0,1 x D	0,15 x D	50	–	70	fz	0,009	0,012	0,014	0,019	0,023	0,027	0,031	0,034	0,037	0,039	0,044

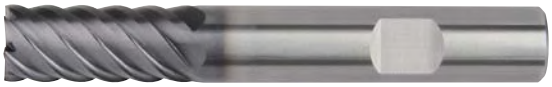
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

Vision Plus • Series 7670 • Application Data • TiAlN-LT1 • Metric

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 10%.									
		A		B	Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	ap	min		max	mm	4,0	5,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	3	0,8 x D	0,5 x D	0,75 x D	160	–	180	fz	0,020	0,025	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	4	0,8 x D	0,4 x D	0,5 x D	140	–	160	fz	0,018	0,023	0,028	0,038	0,046	0,056	0,069	0,088	0,098
	5	0,8 x D	0,5 x D	0,75 x D	60	–	100	fz	0,016	0,021	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	6	0,8 x D	0,4 x D	0,5 x D	50	–	80	fz	0,014	0,017	0,021	0,029	0,034	0,042	0,051	0,065	0,071
M	1	0,8 x D	0,5 x D	0,75 x D	80	–	100	fz	0,020	0,025	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	2	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	3	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,014	0,017	0,021	0,029	0,034	0,042	0,051	0,065	0,071
K	1	0,8 x D	0,5 x D	0,75 x D	120	–	160	fz	0,024	0,031	0,037	0,051	0,061	0,075	0,091	0,114	0,124
	2	0,8 x D	0,5 x D	0,75 x D	110	–	140	fz	0,020	0,025	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	3	0,8 x D	0,4 x D	0,75 x D	100	–	130	fz	0,016	0,021	0,025	0,034	0,041	0,051	0,063	0,081	0,091
S	1	0,8 x D	0,4 x D	0,75 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	0,8 x D	0,25 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	0,8 x D	0,4 x D	0,75 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	4	0,8 x D	0,3 x D	0,5 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	0,8 x D	0,5 x D	0,5 x D	120	–	140	fz	0,018	0,023	0,028	0,038	0,046	0,056	0,069	0,088	0,098
	2	0,8 x D	0,2 x D	0,3 x D	80	–	130	fz	0,014	0,017	0,021	0,029	0,034	0,042	0,051	0,065	0,071
	3	0,8 x D	0,15 x D	0,2 x D	70	–	100	fz	0,011	0,014	0,017	0,023	0,027	0,034	0,041	0,052	0,057

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For rougher tool with 6 flutes, use ap in slotting 60% of table value.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters on diameters >12mm.

Vision Plus • Series D518 • Application Data • WP15PE • Metric



Material Group		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).											
		A		Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	min		max	mm	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	Ap1 max	0,05 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	Ap1 max	0,05 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	Ap1 max	0,05 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	Ap1 max	0,05 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	Ap1 max	0,05 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	Ap1 max	0,05 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	Ap1 max	0,04 x D	50	–	75	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	Ap1 max	0,05 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	Ap1 max	0,05 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	Ap1 max	0,05 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	Ap1 max	0,05 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	Ap1 max	0,05 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	Ap1 max	0,05 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	Ap1 max	0,04 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	Ap1 max	0,04 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	Ap1 max	0,05 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	Ap1 max	0,05 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	Ap1 max	0,04 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	Ap1 max	0,05 x D	70	–	120	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

Vision Plus • Series D618 • Application Data • WU10PE • Metric

Material Group		Side Milling (A)		WU10PE			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	2 x D	0,15 x D	120	–	160	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,096	0,111
	4	2 x D	0,15 x D	90	–	150	fz	0,017	0,024	0,030	0,036	0,049	0,059	0,069	0,084	0,097
H	1	2 x D	0,15 x D	80	–	140	fz	0,017	0,024	0,030	0,036	0,049	0,059	0,069	0,084	0,097
	2	2 x D	0,15 x D	70	–	120	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,063	0,071
	3	2 x D	0,1 x D	60	–	90	fz	0,010	0,014	0,018	0,021	0,029	0,035	0,041	0,051	0,059
	4	2 x D	0,05 x D	50	–	70	fz	0,007	0,009	0,012	0,014	0,019	0,023	0,027	0,034	0,039

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

Vision Plus • Series 7050 7060 Roughing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - roughing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,2 x D	0,1 x D	208	–	234	Fz	0,015	0,023	0,031	0,049	0,067	0,081	0,094	0,117	0,136
	4	0,2 x D	0,1 x D	182	–	208	Fz	0,014	0,021	0,029	0,044	0,060	0,073	0,084	0,103	0,118
H	1	0,15 x D	0,1 x D	140	–	196	Fz	0,021	0,032	0,043	0,066	0,090	0,109	0,125	0,154	0,177
	2	0,1 x D	0,075 x D	119	–	204	Fz	0,024	0,036	0,048	0,074	0,101	0,121	0,140	0,171	0,194
	3	0,05 x D	0,05 x D	138	–	207	Fz	0,027	0,041	0,055	0,084	0,114	0,138	0,161	0,200	0,233
	4	0,05 x D	0,05 x D	115	–	161	Fz	0,018	0,027	0,037	0,056	0,076	0,092	0,107	0,133	0,154

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7050 7060 Semi-Finishing • Application Data • WU10PE • Metric

Material Group		Profile Milling A		WU10PE Cutting Speed — vc m/min			Recommended feed per th (fz) chamfering										
								D1 — Diameter									
		ap	ae	min		max	mm	1,0	2,0	2,5	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	3	0,1 x D	0,1 x D	240	–	320	fz	0,017	0,034	0,043	0,052	0,070	0,089	0,109	0,150	0,182	0,211
	4	0,1 x D	0,1 x D	180	–	300	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	1	0,1 x D	0,1 x D	160	–	280	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
	2	0,1 x D	0,1 x D	140	–	240	fz	0,012	0,024	0,030	0,036	0,048	0,061	0,074	0,101	0,121	0,140
	3	0,1 x D	0,1 x D	120	–	180	fz	0,009	0,019	0,024	0,028	0,038	0,048	0,058	0,079	0,096	0,112
	4	0,1 x D	0,1 x D	100	–	140	fz	0,006	0,012	0,016	0,019	0,025	0,032	0,039	0,053	0,064	0,074

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7050 7060 Finishing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - finishing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,04 x D	0,04 x D	416	–	468	Fz	0,052	0,080	0,108	0,168	0,231	0,279	0,324	0,403	0,466
	4	0,04 x D	0,04 x D	364	–	416	Fz	0,048	0,073	0,099	0,152	0,207	0,249	0,288	0,355	0,406
H	1	0,03 x D	0,03 x D	290	–	406	Fz	0,052	0,078	0,106	0,162	0,221	0,266	0,308	0,379	0,434
	2	0,03 x D	0,03 x D	203	–	348	Fz	0,039	0,059	0,080	0,122	0,166	0,199	0,230	0,281	0,320
	3	0,02 x D	0,02 x D	216	–	324	Fz	0,033	0,050	0,067	0,102	0,139	0,168	0,196	0,244	0,284
	4	0,02 x D	0,02 x D	180	–	252	Fz	0,022	0,033	0,045	0,068	0,093	0,112	0,130	0,162	0,187

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7061 Roughing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - roughing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,2D	0,1D	208	–	234	Fz	0,015	0,023	0,031	0,049	0,067	0,081	0,094	0,117	0,136
P	4	0,2D	0,1D	182	–	208	Fz	0,014	0,021	0,029	0,044	0,060	0,073	0,084	0,103	0,118
H	1	0,15D	0,1D	140	–	196	Fz	0,021	0,032	0,043	0,066	0,090	0,109	0,125	0,154	0,177
H	2	0,1D	0,075D	119	–	204	Fz	0,024	0,036	0,048	0,074	0,101	0,121	0,140	0,171	0,194
H	3	0,05D	0,05D	138	–	207	Fz	0,027	0,041	0,055	0,084	0,114	0,138	0,161	0,200	0,233
H	4	0,05D	0,05D	115	–	161	Fz	0,018	0,027	0,037	0,056	0,076	0,092	0,107	0,133	0,154

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7061 Semi-Finishing • Application Data • WU10PE • Metric

Material Group		Profile Milling A		WU10PE Cutting Speed — vc m/min			Recommended feed per th (fz) chamfering										
								D1 — Diameter									
		ap	ae	min		max	mm	1,0	2,0	2,5	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	3	0,1 x D	0,05 x D	240	–	320	fz	0,017	0,034	0,043	0,052	0,070	0,089	0,109	0,150	0,182	0,211
P	4	0,1 x D	0,1 x D	180	–	300	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	1	0,1 x D	0,1 x D	160	–	280	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	2	0,1 x D	0,1 x D	140	–	240	fz	0,012	0,024	0,030	0,036	0,048	0,061	0,074	0,101	0,121	0,140
H	3	0,1 x D	0,1 x D	120	–	180	fz	0,009	0,019	0,024	0,028	0,038	0,048	0,058	0,079	0,096	0,112
H	4	0,1 x D	0,1 x D	100	–	140	fz	0,006	0,012	0,016	0,019	0,025	0,032	0,039	0,053	0,064	0,074

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7061 Finishing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - finishing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,04 x D	0,04 x D	416	–	468	Fz	0,052	0,080	0,108	0,168	0,231	0,279	0,324	0,403	0,466
P	4	0,04 x D	0,04 x D	364	–	416	Fz	0,048	0,073	0,099	0,152	0,207	0,249	0,288	0,355	0,406
H	1	0,03 x D	0,03 x D	290	–	406	Fz	0,052	0,078	0,106	0,162	0,221	0,266	0,308	0,379	0,434
H	2	0,03 x D	0,03 x D	203	–	348	Fz	0,039	0,059	0,080	0,122	0,166	0,199	0,230	0,281	0,320
H	3	0,02 x D	0,02 x D	216	–	324	Fz	0,033	0,050	0,067	0,102	0,139	0,168	0,196	0,244	0,284
H	4	0,02 x D	0,02 x D	180	–	252	Fz	0,022	0,033	0,045	0,068	0,093	0,112	0,130	0,162	0,187

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7150 Roughing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - roughing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,2 x D	0,1 x D	208	–	234	Fz	0,015	0,023	0,031	0,049	0,067	0,081	0,094	0,117	0,136
P	4	0,2 x D	0,1 x D	182	–	208	Fz	0,014	0,021	0,029	0,044	0,060	0,073	0,084	0,103	0,118
H	1	0,15 x D	0,1 x D	140	–	196	Fz	0,021	0,032	0,043	0,066	0,090	0,109	0,125	0,154	0,177
H	2	0,1 x D	0,075 x D	119	–	204	Fz	0,024	0,036	0,048	0,074	0,101	0,121	0,140	0,171	0,194
H	3	0,05 x D	0,05 x D	138	–	207	Fz	0,027	0,041	0,055	0,084	0,114	0,138	0,161	0,200	0,233
H	4	0,05 x D	0,05 x D	115	–	161	Fz	0,018	0,027	0,037	0,056	0,076	0,092	0,107	0,133	0,154

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7150 Semi-Finishing • Application Data • WU10PE • Metric

Material Group		Profile Milling A		WU10PE Cutting Speed — vc m/min			Recommended feed per th (fz) chamfering										
								D1 — Diameter									
		ap	ae	min		max	mm	1,0	2,0	2,5	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	3	0,1 x D	0,1 x D	240	–	320	fz	0,017	0,034	0,043	0,052	0,070	0,089	0,109	0,150	0,182	0,211
P	4	0,1 x D	0,1 x D	180	–	300	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	1	0,1 x D	0,1 x D	160	–	280	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	2	0,1 x D	0,1 x D	140	–	240	fz	0,012	0,024	0,030	0,036	0,048	0,061	0,074	0,101	0,121	0,140
H	3	0,1 x D	0,1 x D	120	–	180	fz	0,009	0,019	0,024	0,028	0,038	0,048	0,058	0,079	0,096	0,112
H	4	0,1 x D	0,1 x D	100	–	140	fz	0,006	0,012	0,016	0,019	0,025	0,032	0,039	0,053	0,064	0,074

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7150 Finishing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - finishing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,04 x D	0,04 x D	416	–	468	Fz	0,052	0,080	0,108	0,168	0,231	0,279	0,324	0,403	0,466
P	4	0,04 x D	0,04 x D	364	–	416	Fz	0,048	0,073	0,099	0,152	0,207	0,249	0,288	0,355	0,406
H	1	0,03 x D	0,03 x D	290	–	406	Fz	0,052	0,078	0,106	0,162	0,221	0,266	0,308	0,379	0,434
H	2	0,03 x D	0,03 x D	203	–	348	Fz	0,039	0,059	0,080	0,122	0,166	0,199	0,230	0,281	0,320
H	3	0,02 x D	0,02 x D	216	–	324	Fz	0,033	0,050	0,067	0,102	0,139	0,168	0,196	0,244	0,284
H	4	0,02 x D	0,02 x D	180	–	252	Fz	0,022	0,033	0,045	0,068	0,093	0,112	0,130	0,162	0,187

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7151 Roughing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - roughing	D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,2 x D	0,1 x D	208	–	234	Fz	0,015	0,023	0,031	0,049	0,067	0,081	0,094	0,117	0,136
P	4	0,2 x D	0,1 x D	182	–	208	Fz	0,014	0,021	0,029	0,044	0,060	0,073	0,084	0,103	0,118
H	1	0,15 x D	0,1 x D	140	–	196	Fz	0,021	0,032	0,043	0,066	0,090	0,109	0,125	0,154	0,177
H	2	0,1 x D	0,075 x D	119	–	204	Fz	0,024	0,036	0,048	0,074	0,101	0,121	0,140	0,171	0,194
H	3	0,05 x D	0,05 x D	138	–	207	Fz	0,027	0,041	0,055	0,084	0,114	0,138	0,161	0,200	0,233
H	4	0,05 x D	0,05 x D	115	–	161	Fz	0,018	0,027	0,037	0,056	0,076	0,092	0,107	0,133	0,154

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7151 Semi-Finishing • Application Data • WU10PE • Metric

Material Group		Profile Milling A		WU10PE Cutting Speed — vc m/min			Recommended feed per th (fz) chamfering	D1 — Diameter									
		ap	ae	min		max	mm	1,0	2,0	2,5	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	3	0,1 x D	0,05 x D	240	–	320	fz	0,017	0,034	0,043	0,052	0,070	0,089	0,109	0,150	0,182	0,211
P	4	0,1 x D	0,1 x D	180	–	300	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	1	0,1 x D	0,1 x D	160	–	280	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	2	0,1 x D	0,1 x D	140	–	240	fz	0,012	0,024	0,030	0,036	0,048	0,061	0,074	0,101	0,121	0,140
H	3	0,1 x D	0,1 x D	120	–	180	fz	0,009	0,019	0,024	0,028	0,038	0,048	0,058	0,079	0,096	0,112
H	4	0,1 x D	0,1 x D	100	–	140	fz	0,006	0,012	0,016	0,019	0,025	0,032	0,039	0,053	0,064	0,074

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7151 Finishing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - finishing	D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,04 x D	0,04 x D	416	–	468	Fz	0,052	0,080	0,108	0,168	0,231	0,279	0,324	0,403	0,466
P	4	0,04 x D	0,04 x D	364	–	416	Fz	0,048	0,073	0,099	0,152	0,207	0,249	0,288	0,355	0,406
H	1	0,03 x D	0,03 x D	290	–	406	Fz	0,052	0,078	0,106	0,162	0,221	0,266	0,308	0,379	0,434
H	2	0,03 x D	0,03 x D	203	–	348	Fz	0,039	0,059	0,080	0,122	0,166	0,199	0,230	0,281	0,320
H	3	0,02 x D	0,02 x D	216	–	324	Fz	0,033	0,050	0,067	0,102	0,139	0,168	0,196	0,244	0,284
H	4	0,02 x D	0,02 x D	180	–	252	Fz	0,022	0,033	0,045	0,068	0,093	0,112	0,130	0,162	0,187

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 70N1 Roughing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - roughing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,2 x D	0,1 x D	208	–	234	Fz	0,015	0,023	0,031	0,049	0,067	0,081	0,094	0,117	0,136
P	4	0,2 x D	0,1 x D	182	–	208	Fz	0,014	0,021	0,029	0,044	0,060	0,073	0,084	0,103	0,118
H	1	0,15 x D	0,1 x D	140	–	196	Fz	0,021	0,032	0,043	0,066	0,090	0,109	0,125	0,154	0,177
H	2	0,1 x D	0,075 x D	119	–	204	Fz	0,024	0,036	0,048	0,074	0,101	0,121	0,140	0,171	0,194
H	3	0,05 x D	0,05 x D	138	–	207	Fz	0,027	0,041	0,055	0,084	0,114	0,138	0,161	0,200	0,233
H	4	0,05 x D	0,05 x D	115	–	161	Fz	0,018	0,027	0,037	0,056	0,076	0,092	0,107	0,133	0,154

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 70N1 Semi-Finishing • Application Data • WU10PE • Metric

Material Group		Profile Milling A		WU10PE Cutting Speed — vc m/min			Recommended feed per th (fz) chamfering									
								D1 — Diameter								
		ap	ae	min		max	mm	1,0	2,0	2,5	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P	3	0,1 x D	0,1 x D	240	–	320	fz	0,017	0,034	0,043	0,052	0,070	0,089	0,109	0,150	0,182	0,211
P	4	0,1 x D	0,1 x D	180	–	300	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	1	0,1 x D	0,1 x D	160	–	280	fz	0,016	0,031	0,040	0,048	0,064	0,081	0,099	0,134	0,162	0,187
H	2	0,1 x D	0,1 x D	140	–	240	fz	0,012	0,024	0,030	0,036	0,048	0,061	0,074	0,101	0,121	0,140
H	3	0,1 x D	0,1 x D	120	–	180	fz	0,009	0,019	0,024	0,028	0,038	0,048	0,058	0,079	0,096	0,112
H	4	0,1 x D	0,1 x D	100	–	140	fz	0,006	0,012	0,016	0,019	0,025	0,032	0,039	0,053	0,064	0,074

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 70N1 Finishing • Application Data • WU10PE • Metric

Material Group		A		WU10PE Cutting Speed — vc m/min			Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - finishing									
								D1 - Diameter								
		ap	ae	Min		Max	mm	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	3	0,04 x D	0,04 x D	416	–	468	Fz	0,052	0,080	0,108	0,168	0,231	0,279	0,324	0,403	0,466
P	4	0,04 x D	0,04 x D	364	–	416	Fz	0,048	0,073	0,099	0,152	0,207	0,249	0,288	0,355	0,406
H	1	0,03 x D	0,03 x D	290	–	406	Fz	0,052	0,078	0,106	0,162	0,221	0,266	0,308	0,379	0,434
H	2	0,03 x D	0,03 x D	203	–	348	Fz	0,039	0,059	0,080	0,122	0,166	0,199	0,230	0,281	0,320
H	3	0,02 x D	0,02 x D	216	–	324	Fz	0,033	0,050	0,067	0,102	0,139	0,168	0,196	0,244	0,284
H	4	0,02 x D	0,02 x D	180	–	252	Fz	0,022	0,033	0,045	0,068	0,093	0,112	0,130	0,162	0,187

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7N02 7N12 7N22 • Application Data • WU10PE • Metric

Material Group		Side Milling (A) and Slotting (B)			WU10PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.										
		A		B	Cutting Speed — vc m/min				D1 — Diameter									
		ap	ae	ap	min		max	mm	0,3	0,4	0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	0	1,25 x D	0,25 x D	0,75 x D	150	–	200	fz	0,002	0,003	0,003	0,004	0,005	0,007	0,010	0,014	0,017	0,021
	1	1,25 x D	0,25 x D	0,75 x D	150	–	200	fz	0,002	0,003	0,003	0,004	0,005	0,007	0,010	0,014	0,017	0,021
	2	1,25 x D	0,25 x D	0,75 x D	140	–	190	fz	0,002	0,003	0,003	0,004	0,005	0,007	0,010	0,014	0,017	0,021
	3	1,25 x D	0,25 x D	0,75 x D	120	–	160	fz	0,002	0,002	0,003	0,003	0,004	0,006	0,008	0,011	0,014	0,017
	4	1,25 x D	0,25 x D	0,5 x D	90	–	150	fz	0,002	0,002	0,003	0,003	0,004	0,005	0,008	0,010	0,013	0,016
	5	1,25 x D	0,25 x D	0,5 x D	60	–	100	fz	0,001	0,002	0,002	0,003	0,004	0,005	0,007	0,009	0,012	0,014
K	1	1,25 x D	0,25 x D	0,75 x D	120	–	150	fz	0,002	0,003	0,003	0,004	0,005	0,007	0,010	0,014	0,017	0,021
	2	1,25 x D	0,25 x D	0,5 x D	110	–	140	fz	0,002	0,002	0,003	0,003	0,004	0,006	0,008	0,011	0,014	0,017
H	1	1,25 x D	0,25 x D	0,5 x D	80	–	140	fz	0,002	0,002	0,003	0,003	0,004	0,005	0,008	0,010	0,013	0,016
	2	1,25 x D	0,25 x D	0,3 x D	70	–	120	fz	0,001	0,002	0,002	0,002	0,003	0,004	0,006	0,008	0,010	0,012
	3	1,25 x D	0,25 x D	0,25 x D	60	–	90	fz	0,001	0,001	0,002	0,002	0,002	0,003	0,005	0,006	0,008	0,009

Material Group		Side Milling (A) and Slotting (B)			WU10PE			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.										
		A		B	Cutting Speed — vc SFM				D1 — Diameter									
		ap	ae	ap	min		max	mm	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0	2.5	3.0
P	0	1.25 x D	0.25 x D	0.75 x D	492	–	656	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0007	.0008
	1	1.25 x D	0.25 x D	0.75 x D	492	–	656	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0007	.0008
	2	1.25 x D	0.25 x D	0.75 x D	459	–	623	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0007	.0008
	3	1.25 x D	0.25 x D	0.75 x D	394	–	525	IPT	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007
	4	1.25 x D	0.25 x D	0.5 x D	295	–	492	IPT	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0006
	5	1.25 x D	0.25 x D	0.5 x D	197	–	328	IPT	.0001	.0001	.0001	.0001	.0001	.0002	.0003	.0004	.0005	.0006
K	1	1.25 x D	0.25 x D	0.75 x D	394	–	492	IPT	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0007	.0008
	2	1.25 x D	0.25 x D	0.5 x D	361	–	459	IPT	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007
H	1	1.25 x D	0.25 x D	0.5 x D	262	–	459	IPT	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0006
	2	1.25 x D	0.25 x D	0.3 x D	230	–	394	IPT	.0000	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005
	3	1.25 x D	0.25 x D	0.25 x D	197	–	295	IPT	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For tools with reach > 3 x D, reduce fz by 20%.
For tools with reach > 5 x D, reduce fz by 30%.

Vision Plus • Series 7N01 • Application Data • WU10PE • Metric

Material Group		Profile Milling A ap	ae	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) — finishing mm	D1 — Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,04 x D	0,04 x D	432	–	576	fz	0,012	0,015	0,020	0,025	0,038	0,051	0,064	0,078
P	4	0,04 x D	0,04 x D	324	–	540	fz	0,012	0,014	0,019	0,023	0,035	0,047	0,059	0,072
H	1	0,03 x D	0,03 x D	288	–	504	fz	0,012	0,014	0,019	0,023	0,035	0,047	0,059	0,072
H	2	0,03 x D	0,03 x D	252	–	432	fz	0,009	0,011	0,014	0,018	0,027	0,036	0,045	0,054
H	3	0,02 x D	0,02 x D	216	–	324	fz	0,007	0,008	0,011	0,014	0,021	0,028	0,035	0,043
H	4	0,02 x D	0,02 x D	180	–	252	fz	0,005	0,006	0,007	0,009	0,014	0,019	0,024	0,028

Material Group		Profile Milling A ap	ae	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per th (fz) chamfering mm	D1 — Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,1 x D	0,05 x D	300	-	400	fz	0,008	0,010	0,013	0,017	0,025	0,034	0,043	0,052
P	4	0,1 x D	0,05 x D	225	-	375	fz	0,008	0,009	0,012	0,016	0,023	0,031	0,040	0,048
H	1	0,07 x D	0,1 x D	200	-	350	fz	0,008	0,009	0,012	0,016	0,023	0,031	0,040	0,048
H	2	0,05 x D	0,04 x D	175	-	300	fz	0,006	0,007	0,009	0,012	0,018	0,024	0,030	0,036
H	3	0,03 x D	0,03 x D	150	-	225	fz	0,005	0,006	0,007	0,009	0,014	0,019	0,024	0,028
H	4	0,03 x D	0,03 x D	125	-	175	fz	0,003	0,004	0,005	0,006	0,009	0,012	0,016	0,019

Material Group		Profile Milling A ap	ae	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) — roughing mm	D1 — Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,2 x D	0,1 x D	216	-	288	fz	0,004	0,005	0,007	0,008	0,013	0,017	0,021	0,026
P	4	0,2 x D	0,1 x D	162	-	270	fz	0,004	0,005	0,006	0,008	0,012	0,016	0,020	0,024
H	1	0,15 x D	0,1 x D	144	-	252	fz	0,004	0,005	0,006	0,008	0,012	0,016	0,020	0,024
H	2	0,1 x D	0,075 x D	126	-	216	fz	0,003	0,004	0,005	0,006	0,009	0,012	0,015	0,018
H	3	0,05 x D	0,05 x D	108	-	162	fz	0,002	0,003	0,004	0,005	0,007	0,009	0,012	0,014
H	4	0,05 x D	0,05 x D	90	-	126	fz	0,002	0,002	0,002	0,003	0,005	0,006	0,008	0,009

NOTE: Please use reference table for correction of vc based on averages degree of the mold. See page B192.

Vision Plus • Series 7N21 Roughing • Application Data • WU10PE • Metric

Material Group		A ap	ae	WU10PE Cutting Speed — vc m/min Min		Max	Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - roughing mm	D1 - Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,2 x D	0,1 x D	208	–	234	Fz	0,0037	0,0044	0,0059	0,0075	0,0113	0,0152	0,0192	0,0232
P	4	0,2 x D	0,1 x D	182	–	208	Fz	0,0035	0,0042	0,0056	0,0070	0,0105	0,0141	0,0177	0,0213
H	1	0,15 x D	0,1 x D	140	–	196	Fz	0,0052	0,0062	0,0083	0,0104	0,0157	0,0211	0,0265	0,0319
H	2	0,1 x D	0,075 x D	119	–	204	Fz	0,0059	0,0070	0,0094	0,0118	0,0178	0,0238	0,0299	0,0360
H	3	0,05 x D	0,05 x D	138	–	207	Fz	0,0066	0,0080	0,0106	0,0133	0,0201	0,0269	0,0338	0,0408
H	4	0,05 x D	0,05 x D	115	–	161	Fz	0,0044	0,0053	0,0071	0,0089	0,0134	0,0179	0,0226	0,0272

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Vision Plus • Series 7N21 Semi-Finishing • Application Data • WU10PE • Metric

Material Group		Profile Milling A ap	ae	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) — finishing mm	D1 — Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,04 x D	0,04 x D	432	–	576	fz	0,012	0,015	0,020	0,025	0,038	0,051	0,064	0,078
P	4	0,04 x D	0,04 x D	324	–	540	fz	0,012	0,014	0,019	0,023	0,035	0,047	0,059	0,072
H	1	0,03 x D	0,03 x D	288	–	504	fz	0,012	0,014	0,019	0,023	0,035	0,047	0,059	0,072
H	2	0,03 x D	0,03 x D	252	–	432	fz	0,009	0,011	0,014	0,018	0,027	0,036	0,045	0,054
H	3	0,02 x D	0,02 x D	216	–	324	fz	0,007	0,008	0,011	0,014	0,021	0,028	0,035	0,043
H	4	0,02 x D	0,02 x D	180	–	252	fz	0,005	0,006	0,007	0,009	0,014	0,019	0,024	0,028

Material Group		Profile Milling A ap	ae	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) — semi-finishing mm	D1 — Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,1 x D	0,05 x D	300	-	400	fz	0,008	0,010	0,013	0,017	0,025	0,034	0,043	0,052
P	4	0,1 x D	0,05 x D	225	-	375	fz	0,008	0,009	0,012	0,016	0,023	0,031	0,040	0,048
H	1	0,07 x D	0,1 x D	200	-	350	fz	0,008	0,009	0,012	0,016	0,023	0,031	0,040	0,048
H	2	0,05 x D	0,04 x D	175	-	300	fz	0,006	0,007	0,009	0,012	0,018	0,024	0,030	0,036
H	3	0,03 x D	0,03 x D	150	-	225	fz	0,005	0,006	0,007	0,009	0,014	0,019	0,024	0,028
H	4	0,03 x D	0,03 x D	125	-	175	fz	0,003	0,004	0,005	0,006	0,009	0,012	0,016	0,019

Material Group		Profile Milling A ap	ae	WU10PE Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for 3D milling/profiling (A) — roughing mm	D1 — Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,2 x D	0,1 x D	216	-	288	fz	0,004	0,005	0,007	0,008	0,013	0,017	0,021	0,026
P	4	0,2 x D	0,1 x D	162	-	270	fz	0,004	0,005	0,006	0,008	0,012	0,016	0,020	0,024
H	1	0,15 x D	0,1 x D	144	-	252	fz	0,004	0,005	0,006	0,008	0,012	0,016	0,020	0,024
H	2	0,1 x D	0,075 x D	126	-	216	fz	0,003	0,004	0,005	0,006	0,009	0,012	0,015	0,018
H	3	0,05 x D	0,05 x D	108	-	162	fz	0,002	0,003	0,004	0,005	0,007	0,009	0,012	0,014
H	4	0,05 x D	0,05 x D	90	-	126	fz	0,002	0,002	0,002	0,003	0,005	0,006	0,008	0,009

NOTE: Please use reference table for correction of vc based on averages degree of the mold. See page B192.

Vision Plus • Series 7N21 Finishing • Application Data • WU10PE • Metric

Material Group		A ap	ae	WU10PE Cutting Speed — vc m/min Min		Max	Recommended feed per tooth (Fz=mm/th) for 3D milling/profiling (A) - finishing mm	D1 - Diameter 0,5	0,6	0,8	1,0	1,5	2,0	2,5	3,0
P	3	0,04 x D	0,04 x D	416	–	468	Fz	0,0127	0,0153	0,0204	0,0256	0,0389	0,0522	0,0659	0,0796
P	4	0,04 x D	0,04 x D	364	–	416	Fz	0,0119	0,0143	0,0191	0,0239	0,0361	0,0484	0,0609	0,0734
H	1	0,03 x D	0,03 x D	290	–	406	Fz	0,0127	0,0153	0,0204	0,0255	0,0386	0,0517	0,0650	0,0784
H	2	0,03 x D	0,03 x D	203	–	348	Fz	0,0096	0,0116	0,0154	0,0193	0,0292	0,0391	0,0491	0,0592
H	3	0,02 x D	0,02 x D	216	–	324	Fz	0,0081	0,0097	0,0130	0,0163	0,0245	0,0328	0,0413	0,0497
H	4	0,02 x D	0,02 x D	180	–	252	Fz	0,0054	0,0065	0,0087	0,0108	0,0164	0,0219	0,0275	0,0331

NOTE: Please use the reference table to optimize your cutting speed based on the average cutting angle of the application. See page B192.

Table of Factors to Maximize Ball Nose Cutting Speed for Hard Machining • Metric

Calculation Examples

Table of Factors for Speed Calculation of Ball Nose							
Average Wall Angle	ap/D						
	0.003	0.006	0.010	0.016	0.020	0.025	0.030
0.0°	9.1	6.5	5.0	4.0	3.6	3.2	2.9
3.0°	6.2	4.9	4.0	3.3	3.0	2.8	2.6
5.0°	5.1	4.2	3.5	3.0	2.8	2.5	2.4
8.0°	4.1	3.4	3.0	2.6	2.4	2.3	2.1
10.0°	3.6	3.1	2.7	2.4	2.3	2.1	2.0
15.0°	2.8	2.5	2.2	2.0	1.9	1.8	1.7
20.0°	2.3	2.1	1.9	1.8	1.7	1.6	1.6
30.0°	1.7	1.6	1.5	1.4	1.4	1.3	1.3
40.0°	1.4	1.3	1.3	1.2	1.2	1.2	1.2
50.0°	1.2	1.2	1.1	1.1	1.1	1.1	1.1
55.0°	1.1	1.1	1.1	1.1	1.1	1.0	1.0

*For calculating real cutting speed, use formula: Basic cutting speed * Factor*

Choose the coefficient according to the ap/D and average wall angle.

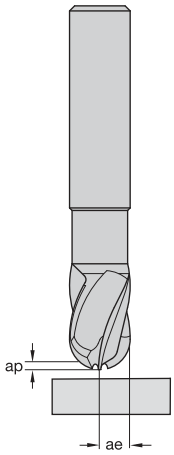
Example 1:
For Tool = 10mm and ap = 0,2mm for average wall angle 0°, ap/D ratio equal 0,2/10 = 0,02. Factor equal 3.6.

Example 2:
For Tool = 8mm and ap = 0,1mm for average wall angle 10°, ap/D ratio equal 0,1/8 = 0,0125. Factor will be between 2.7 and 2.4, choose 2.6.

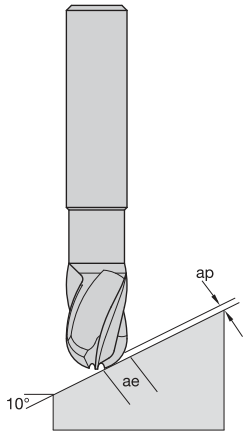
Keep in mind shank diameter and length effect.

If tool length out of the chuck is more than 2 x D, please decrease feed per tooth by 15% each 1 x D.

Material Group	TiAlN or AlTiN Basic Cutting Speed Vc m/min		
	min		max
P3	160	–	180
P4	140	–	160
H1	100	–	140
H2	70	–	120
H3	60	–	90
H4	50	–	70



Application example #1 =
face milling a flat surface
D = 10mm
ap = 0,2mm
Average wall angle = 0°
Finishing H2
Starting vc from chart = 100
ap/D = 0.02
Factor from table =
3.6
vc to program into machine = 100 * 3.6 = 360 m/min
RPM = 360* 1000/3.14/10 = 11460 RPM



Application example #2 =
face milling a 10° average wall angle
D = 8mm
ap = 0,1mm
Average wall angle = 10°
Finishing H2
Starting vc from chart = 100
ap/D = 0,1/8 = 0,0125
Factor from table =
2.6
vc to program into machine = 100 * 2.6 = 260 m/min
RPM = 260* 1000/3.14/10 = 7640 RPM

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HANITA™

HSS End Mills

High-Performance Solid End Milling

The next generation of premium cobalt HSS roughers are designed specifically for titanium and stainless steels. They are engineered with an eccentric relief (ER) grind to provide a stronger cutting edge that requires less torque to operate. The unique proprietary chipbreaker geometry will break and control the chip, enabling higher metal removal rates and greater productivity. The HSS rougher offers the best-in-class performance for difficult-to-machine workpiece materials.

Features and Benefits

High cobalt and vanadium content PM HSS providing superior wear resistance and red hardness.

Different edge preparations and geometries to machine a wide range of materials.

Center cutting offering excellent performance in roughing applications, especially in titanium.

WavCut™ tools for machining titanium are best suited for applications in aerospace and energy, providing high metal removal rates (MRR) and increased tool life. The special wave design of these 4- and 6-fluted end mills requires less horsepower during roughing and semi-finishing, and provides excellent chip formation. Since chips evacuate easily, WavCut tools do not recut chips thus increasing tool life. Also, the edges change the radial cutting edge position without changing the diameter.

SOPHISTICATED

Sophisticated roughing profiles capable of dealing with chip formation issues.

HIGH PERFORMANCE

High-performance finishers with specific geometries for different workpiece materials.

EFFICIENT

Increase stock removal rates over regular roughing tools due to reduced horsepower consumption.

HIGH SPEED STEEL

PRODUCT

SOLID CARBIDE END MILL

GRADE	FLUTE
UNCOATED TiCN	4–8

DIAMETER RANGE

METRIC
6–50mm

INDUSTRY

- GENERAL ENGINEERING
- AEROSPACE
- ENERGY
- TRANSPORTATION

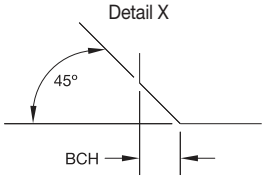
APPLICATIONS

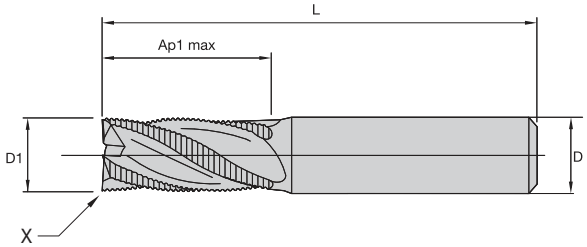
MATERIALS

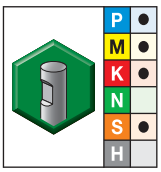
P M K S H

- SIDE MILLING
- RAMPING
- HELICAL INTERPOLATION
- SLOTTING
- DYNAMIC MILLING
- PLUNGING

HSS Roughers • Series 6N06 • Chamfer • Weldon® • Metric







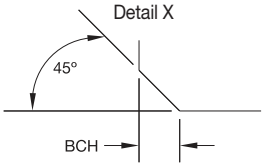
● first choice
○ alternate choice

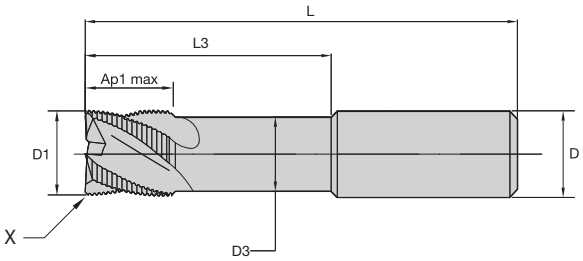
TiAlN-LW

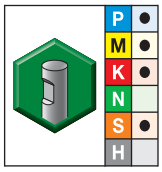
order #	catalogue #	D1	D	length of cut Ap1 max	length L	BCH	ZU
1660373	6N0606002LW	6,0	6	13,00	57	0,25	4
1660389	6N0608004LW	8,0	10	19,00	69	0,25	4
1660397	6N0609004LW	9,0	10	19,00	69	0,25	4
1660405	6N0610004LW	10,0	10	22,00	72	0,25	4
1660421	6N0612005LW	12,0	12	26,00	83	0,35	4
1660437	6N0614005LW	14,0	12	26,00	83	0,35	4
1660453	6N0616006LW	16,0	16	32,00	92	0,35	4
1660479	6N0620007LW	20,0	20	38,00	104	0,35	4
1660487	6N0622007LW	22,0	20	38,00	104	0,50	5
1660497	6N0625008LW	25,0	25	45,00	121	0,50	5
1660507	6N0630008LW	30,0	25	45,00	121	0,50	5

NOTE: For application data, please see page B198.

HSS Roughers • Series 6NL6 • Chamfer • Neck • Weldon® • Metric







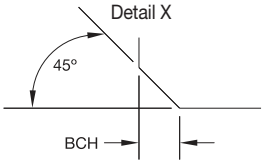
● first choice
○ alternate choice

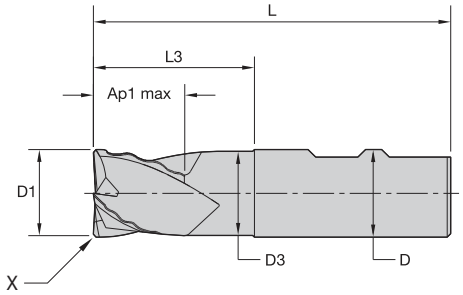
TiAlN-LW

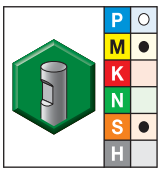
order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU
1660623	6NL612005LW	12,0	12	12	26,00	78,00	125	0,35	4
1660629	6NL616006LW	16,0	16	15	32,00	87,00	138	0,35	4
1660635	6NL620007LW	20,0	20	20	38,00	108,00	160	0,35	4
1660640	6NL625008LW	25,0	25	25	45,00	155,00	216	0,50	5

NOTE: For application data, please see page B198.

WavCut™ I • Series 660W 661W 664W • Chamfer • Weldon® • Metric







● first choice
○ alternate choice

UNCOATED-WW

order #	catalogue #	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU
3871691	664W25008WW	25,0	25	23	26,00	46,00	102	1,00	5
3871692	660W25008WW	25,0	25	23	45,00	65,00	121	1,00	5
3871833	661W25008WW	25,0	25	23	90,00	110,00	166	1,00	6
3871835	660W32009WW	32,0	32	30	53,00	73,00	133	1,00	6
3871836	661W32009WW	32,0	32	30	100,00	110,00	170	1,00	6
3871837	664W40009WW	40,0	32	—	38,00	58,00	118	1,00	6
3871839	661W40009WW	40,0	32	—	100,00	110,00	170	1,00	6
3871840	664W50000WW	50,0	50	47	40,00	60,00	140	1,00	6
3871841	660W50000WW	50,0	50	47	75,00	95,00	175	1,00	6
3871842	661W50000WW	50,0	50	47	110,00	130,00	210	1,00	8

NOTE: For application data, please see page B199.

HSS Roughers • Series 6N06 • Application Data • TiAlN-LW • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiCN Cutting Speed — vc m/min min		max	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	18,0	20,0	25,0	30,0
P	1	1,5 x D	0,5 x D	1 x D	56	–	64	70	–	80	fz	0,046	0,062	0,072	0,079	0,097	0,104	0,109	0,119	0,143
	2	1,5 x D	0,5 x D	1 x D	48	–	64	60	–	80	fz	0,046	0,062	0,072	0,079	0,097	0,104	0,109	0,119	0,143
	3	1,5 x D	0,5 x D	1 x D	40	–	56	50	–	70	fz	0,038	0,052	0,061	0,067	0,084	0,091	0,097	0,109	0,131
	5	1,5 x D	0,5 x D	1 x D	20	–	28	25	–	35	fz	0,031	0,042	0,048	0,054	0,067	0,073	0,078	0,087	0,105
M	1	1,5 x D	0,5 x D	1 x D	20	–	28	25	–	35	fz	0,038	0,052	0,061	0,067	0,084	0,091	0,097	0,109	0,131
	2	1,5 x D	0,5 x D	1 x D	20	–	24	25	–	30	fz	0,031	0,042	0,048	0,054	0,067	0,073	0,078	0,087	0,105
	3	1,5 x D	0,5 x D	1 x D	12	–	16	15	–	20	fz	0,026	0,035	0,040	0,045	0,055	0,059	0,062	0,068	0,082
K	1	1,5 x D	0,5 x D	1 x D	56	–	64	70	–	80	fz	0,046	0,062	0,072	0,079	0,097	0,104	0,109	0,119	0,143
	2	1,5 x D	0,5 x D	1 x D	40	–	56	50	–	70	fz	0,038	0,052	0,061	0,067	0,084	0,091	0,097	0,109	0,131
S	1	1,5 x D	0,5 x D	1 x D	12	–	24	15	–	30	fz	0,038	0,052	0,061	0,067	0,084	0,091	0,097	0,109	0,131
	2	1,5 x D	0,5 x D	1 x D	4	–	12	5	–	15	fz	0,021	0,027	0,032	0,036	0,045	0,048	0,052	0,059	0,071
	3	1,5 x D	0,5 x D	1 x D	12	–	22	15	–	28	fz	0,031	0,042	0,048	0,054	0,067	0,073	0,078	0,087	0,105
	4	1,5 x D	0,5 x D	1 x D	12	–	22	15	–	28	fz	0,027	0,038	0,045	0,050	0,062	0,067	0,071	0,080	0,096

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

HSS Roughers • Series 6NL6 • Application Data • TiAlN-LW • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	70	–	80	fz	0,063	0,070	0,085	0,096	0,104
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,063	0,070	0,085	0,096	0,104
	3	1,5 x D	0,5 x D	1 x D	50	–	70	fz	0,053	0,059	0,073	0,085	0,096
	5	1,5 x D	0,5 x D	1 x D	25	–	35	fz	0,042	0,047	0,059	0,068	0,076
M	1	1,5 x D	0,5 x D	1 x D	25	–	35	fz	0,053	0,059	0,073	0,085	0,096
	2	1,5 x D	0,5 x D	1 x D	25	–	30	fz	0,042	0,047	0,059	0,068	0,076
	3	1,5 x D	0,5 x D	1 x D	15	–	20	fz	0,035	0,039	0,048	0,054	0,060
K	1	1,5 x D	0,5 x D	1 x D	70	–	80	fz	0,063	0,070	0,085	0,096	0,104
	2	1,5 x D	0,5 x D	1 x D	50	–	70	fz	0,053	0,059	0,073	0,085	0,096
S	1	1,5 x D	0,5 x D	1 x D	15	–	30	fz	0,053	0,059	0,073	0,085	0,096
	2	1,5 x D	0,5 x D	1 x D	5	–	15	fz	0,028	0,031	0,039	0,045	0,051
	3	1,5 x D	0,5 x D	1 x D	15	–	30	fz	0,042	0,047	0,059	0,068	0,076
	4	1,5 x D	0,5 x D	1 x D	10	–	20	fz	0,039	0,043	0,054	0,062	0,070

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

WavCut I • Series 664W 660W 661W • Application Data • Uncoated-WW • Metric

Material Group		Side Milling (A) and Slotting (B)			Uncoated			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.				
		A		B	Cutting Speed — vc m/min				D1 — Diameter			
		ap	ae	ap	min		max	mm	25,0	32,0	40,0	50,0
P	5	1,5 x D	0,4 x D	1 x D	10	–	14	fz	0,091	0,105	0,124	0,146
M	1	1,5 x D	0,4 x D	1 x D	10	–	14	fz	0,114	0,131	0,155	0,182
	2	1,5 x D	0,4 x D	1 x D	10	–	12	fz	0,091	0,105	0,124	0,146
S	3	1,5 x D	0,4 x D	0,75 x D	6	–	11	fz	0,091	0,105	0,124	0,146
	4	1,5 x D	0,4 x D	0,75 x D	6	–	11	fz	0,084	0,096	0,114	0,134

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >12mm.

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Holemaking

Selection Guide and Grade Descriptions **C4–C7**

Solid Carbide Drills **C8–C53**

VariDrill C8–C29

TOP DRILL S+ 12 x D C30–C35

TOP DRILL Deep Hole Drills C36–C45

TOP DRILL S Pilot Drills C46–C53

Modular Drills **C54–C84**

TOP DRILL Modular X C54–C70

TOP DRILL M1 ..... C72–C84

Indexable Drills **C86–C110**

Top Cut 4 ..... C86–C110

Hole Finishing **C112–C132**

HSR Reamers C112–C123

TRF and TRM Reamers C124–C132

Modular Boring **C134–C152**

eBore C134–C152

Added Value for Your Performance

Optimized Purchase

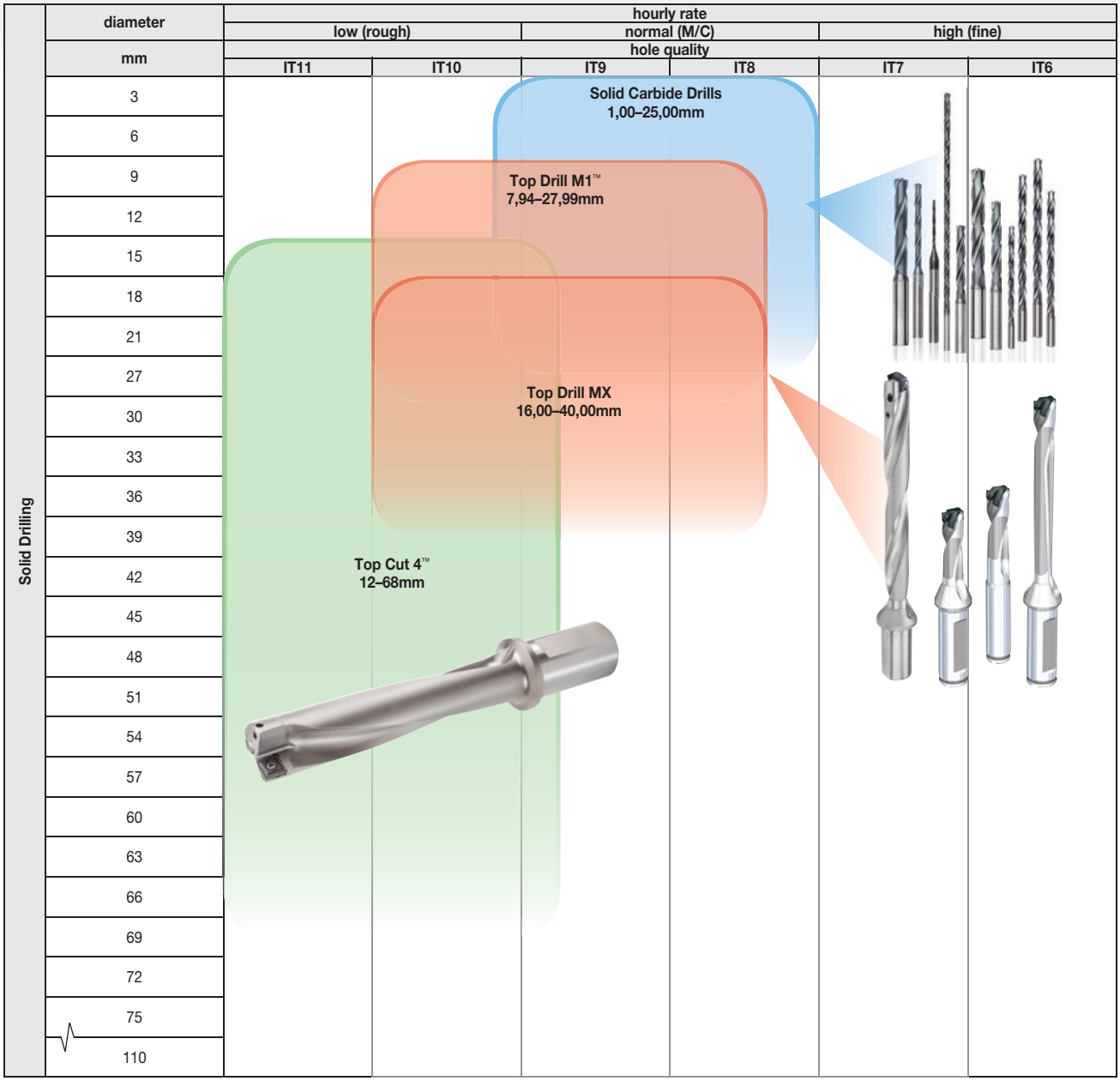
- Broad selection of holemaking tools.
- Integrated into a full range of cutting tools and service offers.
- On-site service for an efficient development and implementation of machining solutions.

Control of Total Tooling Costs

- Process-safe regrinding service.
- Reduction of stocks through efficient modular concepts.
- Multiple platforms per application to achieve the most cost-efficient solution.

- Solid Carbide Drills
- Modular Drills
- Indexable Drills

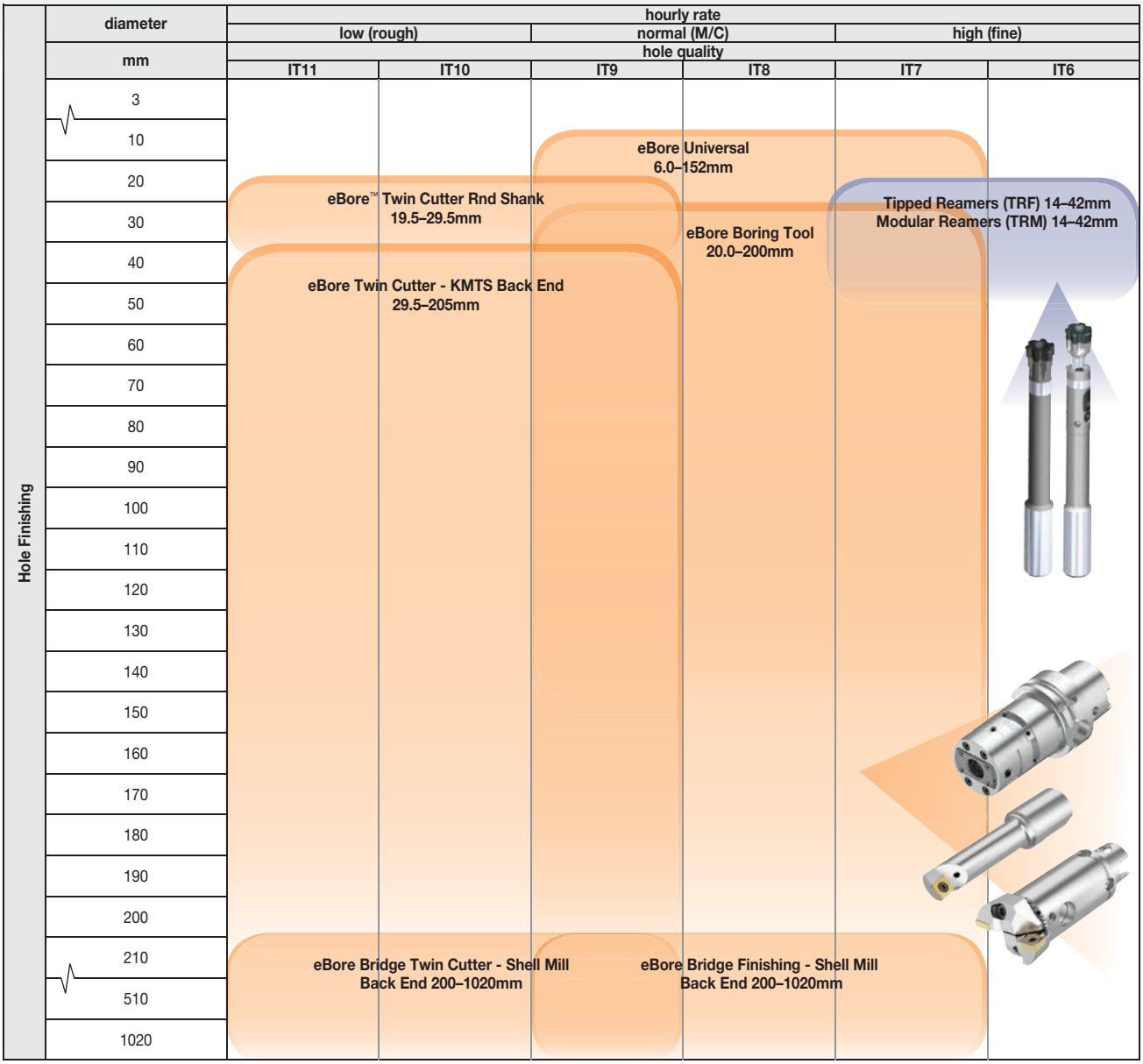
Select the Correct Holemaking Product Platform for Your Application



Added Value for Your Performance

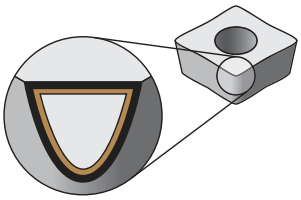
- Reamers
- Modular Boring

Select the Correct Holemaking Product Platform for Your Application



*IT6 is possible above 10mm (0.394") for both HSR SC-Reaming and HSR-Tipped Reamer in custom solutions.

Grades and Grade Descriptions

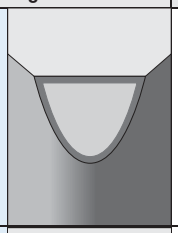
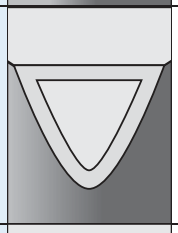
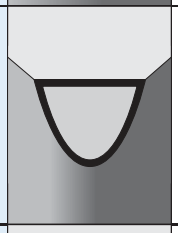
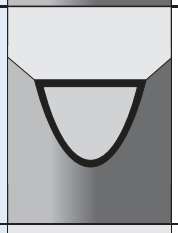
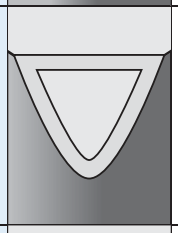
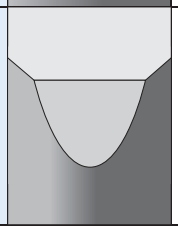


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

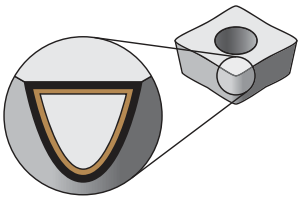
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade

Coating	Grade Description		05	10	15	20	25	30	35	40	45
WK15PD 	**Composition:** With a newly developed unique multilayered PVD AlCrN coating and a high-quality submicron carbide substrate, this grade gives the highest level of wear resistance at high cutting speeds. **Application:** This grade offers extraordinary wear resistance in drilling of cast iron materials. With its high hot hardness, it allows for high-speed machining.	K									
WM15PD 	**Composition:** With PVD AlTiN coating for wear resistance along with unalloyed, submicron tungsten carbide containing 10% cobalt. **Application:** For use in cast iron, stainless steel, non-ferrous, and super alloys. Grade capable to operate at higher temperatures to guarantee high performance at faster cutting speeds.	P M K N S H									
WU20PD 	**Composition:** With a multilayered PVD TiN-TiAlN coating, a high-quality, submicron carbide substrate and a state-of-the-art surface condition, this grade gives the highest level of wear resistance at high cutting speeds. **Application:** First choice for alloyed and high-alloyed steels and cast irons. A state-of-the-art surface condition enables superior chip evacuation even when MQL is applied.	P K									
WU25PD 	**Composition:** With a multilayered PVD TiN-TiAlN coating and a high-quality, submicron carbide substrate, this grade gives a high level of wear resistance at medium to high cutting speeds. **Application:** First choice for high reliability in all materials. This grade should be used at medium to high speeds and feeds. It is a general-purpose grade that performs very well for alloyed and high-alloy steel and cast iron, but can also be used with excellent performance in all other material groups.	P M K N S H									
WP40PD 	**Composition:** With a multilayered TiN-TiAlN coating and a high-quality tough, substrate containing 11% cobalt. **Application:** For use in steel, cast iron, stainless steel, and super alloys. This grade is suitable for critical operations and unstable conditions.	P M K N S H									
WN10HD 	**Composition:** This uncoated fine-grain carbide with high hardness offers excellent abrasive wear resistance. **Application:** First choice for precision drilling of non-ferrous materials.	K N									

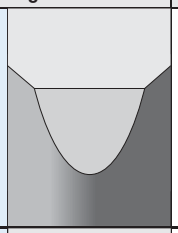
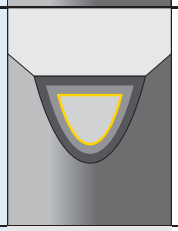
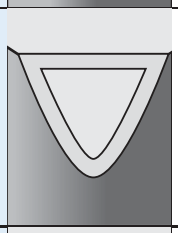
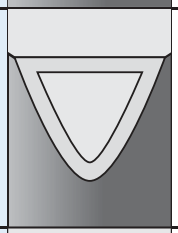
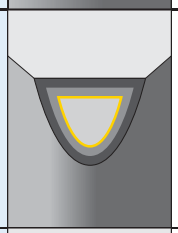
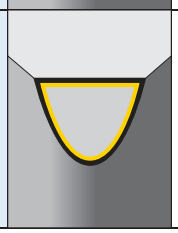
Grades and Grade Descriptions



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ←→ toughness

Coating	Grade Description		05	10	15	20	25	30	35	40	45
WN15HD 	**Composition**: Submicron grain size tungsten carbide for excellent wear resistance and edge retention. **Application**: For use in aluminum and non-ferrous materials										
		K									
		N									
WPK10CH 	**Composition:** With an advanced CVD TiCN-Al_2O_3 coating combined with a cobalt-enriched carbide substrate, this grade offers a balanced combination of deformation resistance and edge toughness. **Application:** Offers outstanding abrasion and crater wear resistance for high-speed machining of steels and cast irons. Use for very high cutting speeds with low to medium feed rates.	P									
		K									
WN10PH 	**Composition**: Submicron grain size tungsten carbide with PVD TiB_2 coating for excellent wear resistance. **Application**: For use in aluminum and non-ferrous applications.										
		N									
WU20PH 	**Composition:** With a wear-resistant TiAlN coating and unalloyed, submicron tungsten carbide containing 10% cobalt. **Application:** This is a universal grade for use in steel, cast iron, stainless steel, and super alloys at medium machining speeds.	P									
		M									
		K									
		N									
		S									
		H									
WU25CH 	**Composition:** Advanced CVD TiCN-Al_2O_3 coating together with a newly engineered, tough carbide substrate. Ensures adequate deformation resistance and excellent edge strength and offers very good wear resistance over a wide range of machining conditions. **Application:** high-productivity grade with high speeds and feeds. First choice for high productivity with excellent reliability in steels, stainless steels, and cast irons.	P									
		M									
		K									
WU40PH 	**Composition:** With a multilayered PVD TiN-TiAlN coating and a tough substrate, this grade withstands interruptions and provides high wear resistance for long tool life. **Application:** First choice for high reliability in most materials. This grade should be used at medium speeds and high feeds due to sharper edges and as a grade for high-toughness applications. It covers steel, stainless steel, cast iron, and high-temp alloys under certain conditions.	P									
		M									
		K									

Grade

VariDrill™

Solid Carbide Drills

The VariDrill solid carbide drill is a versatile drill designed for use in multi-material drilling operations.

The point design offers the ultimate solution for multi-material drilling

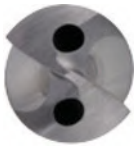
Low runout on the shank

Marginless design to distribute cutting forces evenly for less chipping on the cutting edge

WU25PD grade to enhance wear-resistance

The VariDrill solid carbide drill series is a multi-material drill offered in a wide range of sizes 1–20mm in 0.1mm step in 3 x D, 5 x D, and 8 x D, with and without coolant channels.

WU25PD



P M K N S

Delivers a smooth surface finish across multiple materials:

Steel, stainless steel, aluminum, cast iron, and high-temp alloys.

MULTI-MATERIAL DRILLING

PRODUCT

GRADE

WU25PD

DIAMETER RANGE

1–20mm
1,5–20mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

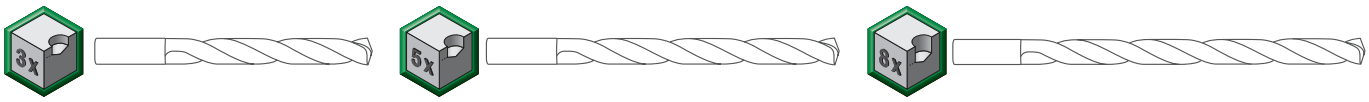
MATERIALS

FIRST CHOICE

P M K N S

Applications

DRILLING	STACKED PLATES	PLAIN SHANK: ≤H6	HELIX ANGLE: 30º	DIN 6537	DIN 6535	THROUGH COOLANT	FLOOD COOLANT	THROUGH COOLANT: MQL



SERIES	COOLANT	LENGTH RATIO	DIAMETER RANGE
VDS201	Non-Coolant	3 x D	1–20mm
VDS202	Non-Coolant	5 x D	1–20mm
VDS401	Through Coolant	3 x D	1,5–20mm
VDS402	Through Coolant	5 x D	1,5–20mm
VDS403	Through Coolant	8 x D	1,5–20mm

PRECISION SHANK

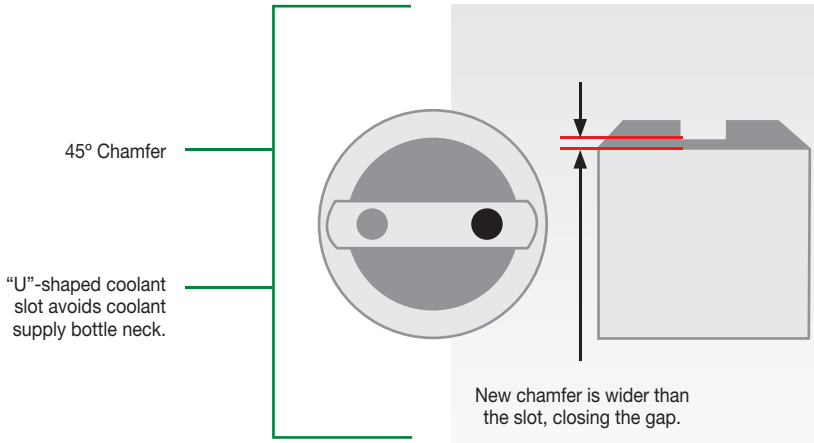
Low Runout
Increase the overall drill stability

VariDrill™ • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

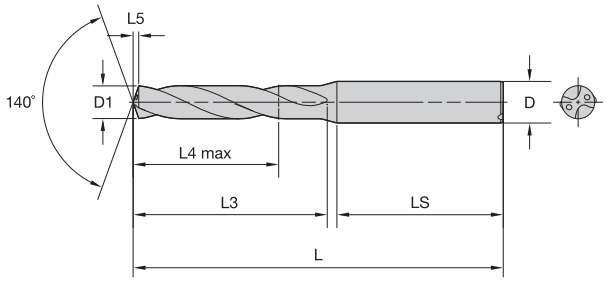
VDS	4	0	1	A	08500	WU25PD
VariDrill Spiral	Flute Style - Coolant	Point	Length	Shank	Diameter in Metric	
	2 = 2 Flute Spiral Non-Coolant **4** = 2 Flute Spiral Coolant	**0** = Conventional Cone Point	**1** = ~ 3 x D **2** = ~ 5 x D **3** = ~ 8 x D	**A =** Cylindrical Shank, DIN 6535 - 2mm steps **F =** Whistle Notch 2, DIN 6535 - 2mm steps	**03000** = 3,000mm **06350** = 1/4"	**W**IDIA™; **U**niversal, Application **25** = roughing carbide, **P**VD coated, **D**rill

New type "A"

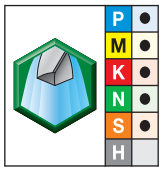


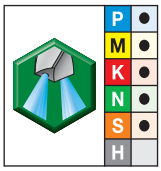
New standard back end fufills the requirements of DIN 6535 and 69090-03 for variable use of internal coolant or MQL.

VariDrill • 3 x D • VDS201A / VDS401A • A-Shank



For information on L, L3, and L4 max, see page C29.



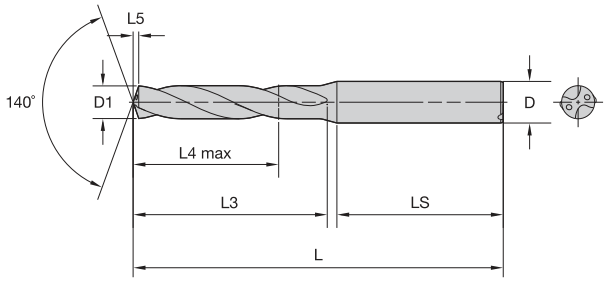


● first choice
○ alternate choice

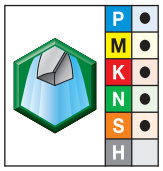
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144195	VDS201A01000		–	1,000	.0394	5	7	0,2	58	28	4
4144196	VDS201A01016		–	1,016	.0400	5	7	0,1	58	28	4
4144197	VDS201A01041		–	1,041	.0410	5	7	0,2	58	28	4
4144198	VDS201A01067		–	1,067	.0420	5	7	0,2	58	28	4
4144199	VDS201A01092		–	1,092	.0430	5	7	0,2	58	28	4
4144200	VDS201A01100		–	1,100	.0433	5	7	0,2	58	28	4
4144201	VDS201A01181		–	1,181	.0465	5	7	0,2	58	28	4
4144202	VDS201A01191		–	1,191	.0469	5	7	0,2	58	28	4
4144523	VDS201A01200		–	1,200	.0472	5	7	0,2	58	28	4
4144524	VDS201A01300		–	1,300	.0512	5	7	0,2	58	28	4
4144526	VDS201A01397		–	1,397	.0550	5	7	0,2	58	28	4
4144527	VDS201A01400		–	1,400	.0551	5	7	0,2	58	28	4
4144528	VDS201A01500	4140270	VDS401A01500	1,500	.0591	6	9	0,2	58	28	4
4144529	VDS201A01600		–	1,600	.0630	6	9	0,3	58	28	4
	–	4140271	VDS401A01600	1,600	.0630	6	9	0,2	58	28	4
4144530	VDS201A01700	4140272	VDS401A01700	1,700	.0669	6	9	0,3	58	28	4
4144531	VDS201A01800	4140423	VDS401A01800	1,800	.0709	6	9	0,3	58	28	4
4144532	VDS201A01900	4140424	VDS401A01900	1,900	.0748	6	9	0,3	58	28	4
4144533	VDS201A01984	4140425	VDS401A01984	1,984	.0781	10	13	0,3	58	28	4
4144534	VDS201A02000	4140426	VDS401A02000	2,000	.0787	10	13	0,3	58	28	4
4144535	VDS201A02100	4140427	VDS401A02100	2,100	.0827	10	13	0,3	58	28	4
4144536	VDS201A02200	4140428	VDS401A02200	2,200	.0866	10	13	0,3	58	28	4
4144537	VDS201A02300	4140429	VDS401A02300	2,300	.0906	10	13	0,4	58	28	4
4144538	VDS201A02383	4140430	VDS401A02383	2,383	.0938	12	17	0,4	58	28	4
4144539	VDS201A02400	4140431	VDS401A02400	2,400	.0945	12	17	0,4	58	28	4
4144540	VDS201A02439	4140432	VDS401A02439	2,439	.0960	12	17	0,4	58	28	4
4144541	VDS201A02489	4140433	VDS401A02489	2,489	.0980	12	17	0,4	58	28	4
4144542	VDS201A02500	4140434	VDS401A02500	2,500	.0984	12	17	0,4	58	28	4
4144543	VDS201A02578	4140435	VDS401A02578	2,578	.1015	12	17	0,4	58	28	4
4144544	VDS201A02600	4140436	VDS401A02600	2,600	.1024	12	17	0,4	58	28	4
4144545	VDS201A02642	4140437	VDS401A02642	2,642	.1040	12	17	0,4	58	28	4
4144546	VDS201A02700	4140438	VDS401A02700	2,700	.1063	12	17	0,4	58	28	4
4144547	VDS201A02705	4140439	VDS401A02705	2,705	.1065	12	17	0,4	58	28	4
4144548	VDS201A02779	4140440	VDS401A02779	2,779	.1094	12	17	0,4	58	28	4
4144549	VDS201A02800	4140441	VDS401A02800	2,800	.1102	12	17	0,5	58	28	4
4144550	VDS201A02820	4140442	VDS401A02820	2,820	.1110	12	17	0,5	58	28	4
4144551	VDS201A02870	4140443	VDS401A02870	2,870	.1130	12	17	0,5	58	28	4
4144552	VDS201A02900	4140444	VDS401A02900	2,900	.1142	12	17	0,5	58	28	4
4144553	VDS201A02947	4140445	VDS401A02947	2,947	.1160	12	17	0,5	58	28	4
4143907	VDS201A03000	4140299	VDS401A03000	3,000	.1181	14	20	0,5	62	36	6
4143908	VDS201A03048	4140300	VDS401A03048	3,048	.1200	14	20	0,5	62	36	6
4143909	VDS201A03100	4140301	VDS401A03100	3,100	.1220	14	20	0,5	62	36	6
4143910	VDS201A03175	4140302	VDS401A03175	3,175	.1250	14	20	0,5	62	36	6
4143911	VDS201A03200	4140303	VDS401A03200	3,200	.1260	14	20	0,5	62	36	6
4143912	VDS201A03264	4140304	VDS401A03264	3,264	.1285	14	20	0,5	62	36	6
4143913	VDS201A03300	4140305	VDS401A03300	3,300	.1299	14	20	0,5	62	36	6
4143914	VDS201A03400	4140306	VDS401A03400	3,400	.1339	14	20	0,6	62	36	6
4143915	VDS201A03455	4140307	VDS401A03455	3,455	.1360	14	20	0,6	62	36	6
4143916	VDS201A03500	4140308	VDS401A03500	3,500	.1378	14	20	0,6	62	36	6
4143917	VDS201A03571	4140309	VDS401A03571	3,571	.1406	14	20	0,6	62	36	6
4143918	VDS201A03600	4140310	VDS401A03600	3,600	.1417	14	20	0,6	62	36	6
4143919	VDS201A03658	4140311	VDS401A03658	3,658	.1440	14	20	0,6	62	36	6

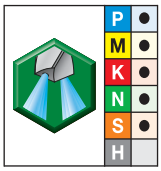
VariDrill • 3 x D • VDS201A / VDS401A • A-Shank

(continued)



For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143920	VDS201A03700	4140312	VDS401A03700	3,700	.1457	14	20	0,6	62	36	6
4143921	VDS201A03734	4140313	VDS401A03734	3,734	.1470	14	20	0,6	62	36	6
4143922	VDS201A03800	4140314	VDS401A03800	3,800	.1496	17	24	0,6	66	36	6
4143923	VDS201A03900	4140315	VDS401A03900	3,900	.1535	17	24	0,6	66	36	6
4143924	VDS201A03970	4140316	VDS401A03970	3,970	.1563	17	24	0,7	66	36	6
4143925	VDS201A04000	4140317	VDS401A04000	4,000	.1575	17	24	0,7	66	36	6
4143926	VDS201A04039	4140318	VDS401A04039	4,039	.1590	17	24	0,7	66	36	6
4143927	VDS201A04090	4140319	VDS401A04090	4,090	.1610	17	24	0,7	66	36	6
4143928	VDS201A04100	4140320	VDS401A04100	4,100	.1614	17	24	0,7	66	36	6
4143929	VDS201A04200	4140321	VDS401A04200	4,200	.1654	17	24	0,7	66	36	6
4143930	VDS201A04217		–	4,217	.1660	17	24	0,7	66	36	6
4143931	VDS201A04300	4140323	VDS401A04300	4,300	.1693	17	24	0,7	66	36	6
4143932	VDS201A04366	4140324	VDS401A04366	4,366	.1719	17	24	0,7	66	36	6
4143933	VDS201A04400	4140325	VDS401A04400	4,400	.1732	17	24	0,7	66	36	6
4143934	VDS201A04500	4140326	VDS401A04500	4,500	.1772	17	24	0,7	66	36	6
4143935	VDS201A04600	4140328	VDS401A04600	4,600	.1811	17	24	0,8	66	36	6
4143936	VDS201A04623	4140329	VDS401A04623	4,623	.1820	17	24	0,8	66	36	6
4143937	VDS201A04700	4140330	VDS401A04700	4,700	.1850	17	24	0,8	66	36	6
4143938	VDS201A04763	4140331	VDS401A04763	4,763	.1875	20	28	0,8	66	36	6
4143939	VDS201A04800	4140332	VDS401A04800	4,800	.1890	20	28	0,8	66	36	6
4143940	VDS201A04852	4140333	VDS401A04852	4,852	.1910	20	28	0,8	66	36	6
4143941	VDS201A04900	4140334	VDS401A04900	4,900	.1929	20	28	0,8	66	36	6
4143942	VDS201A05000	4140335	VDS401A05000	5,000	.1969	20	28	0,8	66	36	6
4143943	VDS201A05100	4140336	VDS401A05100	5,100	.2008	20	28	0,9	66	36	6
4143944	VDS201A05106	4140337	VDS401A05106	5,106	.2010	20	28	0,9	66	36	6
4143945	VDS201A05159	4140338	VDS401A05159	5,159	.2031	20	28	0,9	66	36	6
4143946	VDS201A05200	4140339	VDS401A05200	5,200	.2047	20	28	0,9	66	36	6
4143947	VDS201A05300	4140340	VDS401A05300	5,300	.2087	20	28	0,9	66	36	6
4143948	VDS201A05400	4140341	VDS401A05400	5,400	.2126	20	28	0,9	66	36	6
4143949	VDS201A05410	4140342	VDS401A05410	5,410	.2130	20	28	0,9	66	36	6
4143950	VDS201A05500	4140343	VDS401A05500	5,500	.2165	20	28	0,9	66	36	6
4143951	VDS201A05558	4140344	VDS401A05558	5,558	.2188	20	28	0,9	66	36	6
4143952	VDS201A05600	4140345	VDS401A05600	5,600	.2205	20	28	0,9	66	36	6
4143953	VDS201A05616	4140346	VDS401A05616	5,616	.2211	20	28	0,9	66	36	6
4143954	VDS201A05700	4140347	VDS401A05700	5,700	.2244	20	28	1,0	66	36	6
4143955	VDS201A05800	4140348	VDS401A05800	5,800	.2283	20	28	1,0	66	36	6
4143956	VDS201A05900	4140349	VDS401A05900	5,900	.2323	20	28	1,0	66	36	6
4143957	VDS201A05954	4140350	VDS401A05954	5,954	.2344	20	28	1,0	66	36	6
4143958	VDS201A06000	4140351	VDS401A06000	6,000	.2362	20	28	1,0	66	36	6
4143959	VDS201A06100	4140352	VDS401A06100	6,100	.2402	24	34	1,0	79	36	8
4143960	VDS201A06200	4140353	VDS401A06200	6,200	.2441	24	34	1,0	79	36	8
4143961	VDS201A06300	4140354	VDS401A06300	6,300	.2480	24	34	1,1	79	36	8
4143962	VDS201A06350	4140355	VDS401A06350	6,350	.2500	24	34	1,1	79	36	8
4143963	VDS201A06400	4140356	VDS401A06400	6,400	.2520	24	34	1,1	79	36	8
4143964	VDS201A06500	4140357	VDS401A06500	6,500	.2559	24	34	1,1	79	36	8
4143965	VDS201A06528	4140358	VDS401A06528	6,528	.2570	24	34	1,1	79	36	8
4143966	VDS201A06600	4140359	VDS401A06600	6,600	.2598	24	34	1,1	79	36	8
4143967	VDS201A06630	4140360	VDS401A06630	6,630	.2610	24	34	1,1	79	36	8
4143968	VDS201A06700	4140361	VDS401A06700	6,700	.2638	24	34	1,1	79	36	8
4143969	VDS201A06746	4140362	VDS401A06746	6,746	.2656	24	34	1,1	79	36	8
4143970	VDS201A06800	4140363	VDS401A06800	6,800	.2677	24	34	1,1	79	36	8
4143971	VDS201A06900	4140364	VDS401A06900	6,900	.2717	24	34	1,2	79	36	8

VariDrill • 3 x D • VDS201A / VDS401A • A-Shank

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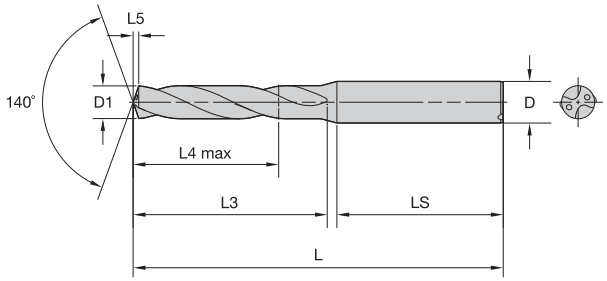
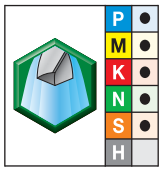
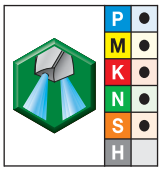


For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143972	VDS201A07000	4140365	VDS401A07000	7,000	.2756	24	34	1,2	79	36	8
4143973	VDS201A07100	4140366	VDS401A07100	7,100	.2795	29	41	1,2	79	36	8
4143974	VDS201A07145	4140367	VDS401A07145	7,145	.2813	29	41	1,2	79	36	8
4143975	VDS201A07200	4140368	VDS401A07200	7,200	.2835	29	41	1,2	79	36	8
4143976	VDS201A07300	4140369	VDS401A07300	7,300	.2874	29	41	1,2	79	36	8
4143977	VDS201A07400	4140370	VDS401A07400	7,400	.2913	29	41	1,3	79	36	8
4143978	VDS201A07500	4140371	VDS401A07500	7,500	.2953	29	41	1,3	79	36	8
4143979	VDS201A07541	4140372	VDS401A07541	7,541	.2969	29	41	1,3	79	36	8
4143980	VDS201A07600	4140373	VDS401A07600	7,600	.2992	29	41	1,3	79	36	8
4143981	VDS201A07700	4140374	VDS401A07700	7,700	.3031	29	41	1,3	79	36	8
4143982	VDS201A07800	4140375	VDS401A07800	7,800	.3071	29	41	1,3	79	36	8
4143983	VDS201A07900	4140376	VDS401A07900	7,900	.3110	29	41	1,3	79	36	8
4143984	VDS201A07938	4140377	VDS401A07938	7,938	.3125	29	41	1,3	79	36	8
4143985	VDS201A08000	4140378	VDS401A08000	8,000	.3150	29	41	1,4	79	36	8
4143986	VDS201A08100	4140379	VDS401A08100	8,100	.3189	35	47	1,4	89	40	10
4143987	VDS201A08200	4140380	VDS401A08200	8,200	.3228	35	47	1,4	89	40	10
4143988	VDS201A08300	4140381	VDS401A08300	8,300	.3268	35	47	1,4	89	40	10
4143989	VDS201A08334	4140382	VDS401A08334	8,334	.3281	35	47	1,4	89	40	10
4143990	VDS201A08400	4140383	VDS401A08400	8,400	.3307	35	47	1,4	89	40	10
4143991	VDS201A08433	4140384	VDS401A08433	8,433	.3320	35	47	1,4	89	40	10
4143992	VDS201A08500	4140385	VDS401A08500	8,500	.3346	35	47	1,4	89	40	10
4143993	VDS201A08600	4140386	VDS401A08600	8,600	.3386	35	47	1,5	89	40	10
4143994	VDS201A08700	4140387	VDS401A08700	8,700	.3425	35	47	1,5	89	40	10
4143995	VDS201A08733	4140388	VDS401A08733	8,733	.3438	35	47	1,5	89	40	10
4143996	VDS201A08800	4140389	VDS401A08800	8,800	.3465	35	47	1,5	89	40	10
4143997	VDS201A08900	4140390	VDS401A08900	8,900	.3504	35	47	1,5	89	40	10
4143998	VDS201A09000	4140391	VDS401A09000	9,000	.3543	35	47	1,5	89	40	10
4143999	VDS201A09100		–	9,100	.3583	35	47	1,5	89	40	10
	–	4140392	VDS401A09100	9,100	.3583	35	47	1,6	89	40	10
4144000	VDS201A09129	4140393	VDS401A09129	9,129	.3594	35	47	1,6	89	40	10
4144001	VDS201A09200	4140394	VDS401A09200	9,200	.3622	35	47	1,6	89	40	10
4144002	VDS201A09300	4140395	VDS401A09300	9,300	.3661	35	47	1,6	89	40	10
4144003	VDS201A09347	4140396	VDS401A09347	9,347	.3680	35	47	1,6	89	40	10
4144004	VDS201A09400	4140397	VDS401A09400	9,400	.3701	35	47	1,6	89	40	10
4144005	VDS201A09500	4140398	VDS401A09500	9,500	.3740	35	47	1,6	89	40	10
4144006	VDS201A09525	4140399	VDS401A09525	9,525	.3750	35	47	1,6	89	40	10
4144007	VDS201A09600	4140400	VDS401A09600	9,600	.3780	35	47	1,6	89	40	10
4144008	VDS201A09700	4140401	VDS401A09700	9,700	.3819	35	47	1,7	89	40	10
4144009	VDS201A09800	4140402	VDS401A09800	9,800	.3858	35	47	1,7	89	40	10
4144010	VDS201A09900	4140403	VDS401A09900	9,900	.3898	35	47	1,7	89	40	10
4144011	VDS201A09921	4140404	VDS401A09921	9,921	.3906	35	47	1,7	89	40	10
4144172	VDS201A10000	4140001	VDS401A10000	10,000	.3937	35	47	1,7	89	40	10
4144423	VDS201A10100	4140002	VDS401A10100	10,100	.3976	40	55	1,7	102	45	12
4144424	VDS201A10200	4140163	VDS401A10200	10,200	.4016	40	55	1,7	102	45	12
4144425	VDS201A10300	4140164	VDS401A10300	10,300	.4055	40	55	1,8	102	45	12
4144426	VDS201A10320	4140165	VDS401A10320	10,320	.4063	40	55	1,8	102	45	12
4144427	VDS201A10400	4140166	VDS401A10400	10,400	.4094	40	55	1,8	102	45	12
4144428	VDS201A10500	4140167	VDS401A10500	10,500	.4134	40	55	1,8	102	45	12
4144429	VDS201A10600	4140168	VDS401A10600	10,600	.4173	40	55	1,8	102	45	12
4144430	VDS201A10700	4140169	VDS401A10700	10,700	.4213	40	55	1,8	102	45	12
4144431	VDS201A10716	4140170	VDS401A10716	10,716	.4219	40	55	1,8	102	45	12
4144432	VDS201A10800	4140171	VDS401A10800	10,800	.4252	40	55	1,9	102	45	12

VariDrill • 3 x D • VDS201A / VDS401A • A-Shank

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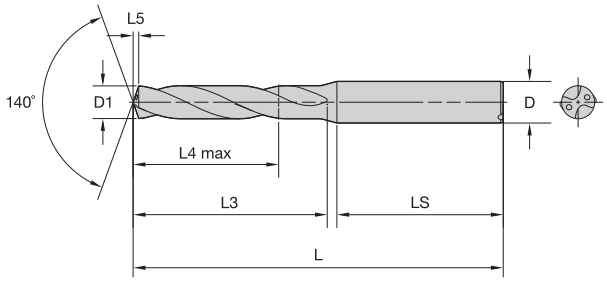
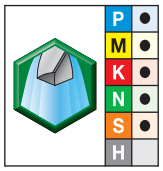
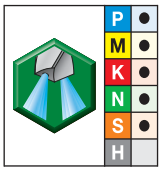


For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144433	VDS201A10900	4140172	VDS401A10900	10,900	.4291	40	55	1,9	102	45	12
4144434	VDS201A11000	4140173	VDS401A11000	11,000	.4331	40	55	1,9	102	45	12
4144435	VDS201A11100	4140174	VDS401A11100	11,100	.4370	40	55	1,9	102	45	12
4144436	VDS201A11113	4140175	VDS401A11113	11,113	.4375	40	55	1,9	102	45	12
4144437	VDS201A11200	4140176	VDS401A11200	11,200	.4409	40	55	1,9	102	45	12
4144438	VDS201A11300	4140177	VDS401A11300	11,300	.4449	40	55	1,9	102	45	12
4144439	VDS201A11400	4140178	VDS401A11400	11,400	.4488	40	55	2,0	102	45	12
4144440	VDS201A11500	4140179	VDS401A11500	11,500	.4528	40	55	2,0	102	45	12
4144441	VDS201A11509	4140180	VDS401A11509	11,509	.4531	40	55	2,0	102	45	12
4144442	VDS201A11600	4140181	VDS401A11600	11,600	.4567	40	55	2,0	102	45	12
4144443	VDS201A11700	4140182	VDS401A11700	11,700	.4606	40	55	2,0	102	45	12
4144444	VDS201A11800	4140183	VDS401A11800	11,800	.4646	40	55	2,0	102	45	12
4144445	VDS201A11900	4140184	VDS401A11900	11,900	.4685	40	55	2,0	102	45	12
4144446	VDS201A11908	4140185	VDS401A11908	11,908	.4688	40	55	2,0	102	45	12
4144447	VDS201A12000	4140186	VDS401A12000	12,000	.4724	40	55	2,1	102	45	12
4144448	VDS201A12100	4140187	VDS401A12100	12,100	.4764	43	60	2,1	107	45	14
4144449	VDS201A12200	4140188	VDS401A12200	12,200	.4803	43	60	2,1	107	45	14
4144450	VDS201A12300	4140189	VDS401A12300	12,300	.4843	43	60	2,1	107	45	14
4144451	VDS201A12304	4140190	VDS401A12304	12,304	.4844	43	60	2,1	107	45	14
4144452	VDS201A12400	4140191	VDS401A12400	12,400	.4882	43	60	2,1	107	45	14
4144453	VDS201A12500	4140192	VDS401A12500	12,500	.4921	43	60	2,2	107	45	14
4144454	VDS201A12600	4140194	VDS401A12600	12,600	.4961	43	60	2,2	107	45	14
4144455	VDS201A12700	4140195	VDS401A12700	12,700	.5000	43	60	2,2	107	45	14
4144456	VDS201A12800	4140196	VDS401A12800	12,800	.5039	43	60	2,2	107	45	14
4144457	VDS201A12900	4140197	VDS401A12900	12,900	.5079	43	60	2,2	107	45	14
4144458	VDS201A13000	4140198	VDS401A13000	13,000	.5118	43	60	2,2	107	45	14
4144459	VDS201A13096	4140199	VDS401A13096	13,096	.5156	43	60	2,3	107	45	14
4144460	VDS201A13100	4140200	VDS401A13100	13,100	.5157	43	60	2,3	107	45	14
4144461	VDS201A13200	4140201	VDS401A13200	13,200	.5197	43	60	2,3	107	45	14
4144462	VDS201A13300	4140202	VDS401A13300	13,300	.5236	43	60	2,3	107	45	14
4144463	VDS201A13400	4140203	VDS401A13400	13,400	.5276	43	60	2,3	107	45	14
4144464	VDS201A13500	4140204	VDS401A13500	13,500	.5315	43	60	2,3	107	45	14
4144465	VDS201A13600	4140205	VDS401A13600	13,600	.5354	43	60	2,3	107	45	14
4144466	VDS201A13700	4140206	VDS401A13700	13,700	.5394	43	60	2,4	107	45	14
4144467	VDS201A13800	4140207	VDS401A13800	13,800	.5433	43	60	2,4	107	45	14
4144468	VDS201A13891		–	13,891	.5469	43	60	2,4	107	45	14
4144469	VDS201A13900	4140209	VDS401A13900	13,900	.5472	43	60	2,4	107	45	14
4144470	VDS201A14000	4140210	VDS401A14000	14,000	.5512	43	60	2,4	107	45	14
4144471	VDS201A14100	4140211	VDS401A14100	14,100	.5551	45	65	2,4	115	48	16
4144472	VDS201A14200	4140212	VDS401A14200	14,200	.5591	45	65	2,5	115	48	16
4144473	VDS201A14288	4140213	VDS401A14288	14,288	.5625	45	65	2,5	115	48	16
4144474	VDS201A14300	4140214	VDS401A14300	14,300	.5630	45	65	2,5	115	48	16
4144475	VDS201A14400	4140215	VDS401A14400	14,400	.5669	45	65	2,5	115	48	16
4144476	VDS201A14500	4140216	VDS401A14500	14,500	.5709	45	65	2,5	115	48	16
4144477	VDS201A14600	4140217	VDS401A14600	14,600	.5748	45	65	2,5	115	48	16
4144478	VDS201A14684	4140218	VDS401A14684	14,684	.5781	45	65	2,5	115	48	16
4144479	VDS201A14700	4140219	VDS401A14700	14,700	.5787	45	65	2,5	115	48	16
4144480	VDS201A14800	4140220	VDS401A14800	14,800	.5827	45	65	2,6	115	48	16
4144481	VDS201A14900	4140221	VDS401A14900	14,900	.5866	45	65	2,6	115	48	16
4144482	VDS201A15000	4140222	VDS401A15000	15,000	.5906	45	65	2,6	115	48	16
4144483	VDS201A15083	4140223	VDS401A15083	15,083	.5938	45	65	2,6	115	48	16
4144484	VDS201A15100	4140224	VDS401A15100	15,100	.5945	45	65	2,6	115	48	16

VariDrill • 3 x D • VDS201A / VDS401A • A-Shank

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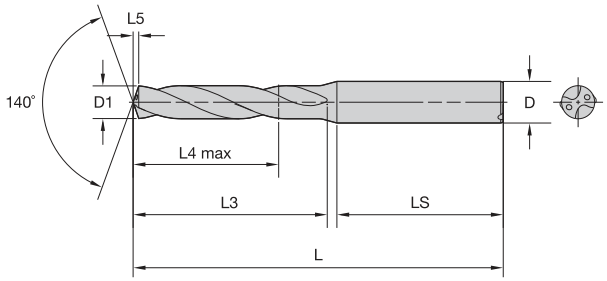
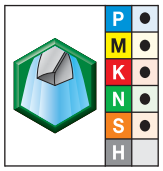
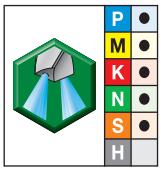


For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144485	VDS201A15200	4140225	VDS401A15200	15,200	.5984	45	65	2,6	115	48	16
4144486	VDS201A15300	4140226	VDS401A15300	15,300	.6024	45	65	2,6	115	48	16
4144487	VDS201A15400	4140227	VDS401A15400	15,400	.6063	45	65	2,7	115	48	16
4144488	VDS201A15479	4140228	VDS401A15479	15,479	.6094	45	65	2,7	115	48	16
4144489	VDS201A15500	4140229	VDS401A15500	15,500	.6102	45	65	2,7	115	48	16
4144490	VDS201A15600	4140230	VDS401A15600	15,600	.6142	45	65	2,7	115	48	16
4144491	VDS201A15700	4140231	VDS401A15700	15,700	.6181	45	65	2,7	115	48	16
4144492	VDS201A15800	4140232	VDS401A15800	15,800	.6220	45	65	2,7	115	48	16
4144493	VDS201A15875	4140233	VDS401A15875	15,875	.6250	45	65	2,8	115	48	16
4144494	VDS201A15900	4140234	VDS401A15900	15,900	.6260	45	65	2,8	115	48	16
4144495	VDS201A16000	4140235	VDS401A16000	16,000	.6299	45	65	2,8	115	48	16
4144496	VDS201A16100	4140236	VDS401A16100	16,100	.6339	51	73	2,8	123	48	18
4144497	VDS201A16200	4140237	VDS401A16200	16,200	.6378	51	73	2,8	123	48	18
4144498	VDS201A16271		–	16,271	.6406	51	73	2,8	123	48	18
4144499	VDS201A16300	4140239	VDS401A16300	16,300	.6417	51	73	2,8	123	48	18
4144500	VDS201A16400	4140241	VDS401A16400	16,400	.6457	51	73	2,8	123	48	18
4144501	VDS201A16500	4140242	VDS401A16500	16,500	.6496	51	73	2,9	123	48	18
4144503	VDS201A16600	4140243	VDS401A16600	16,600	.6535	51	73	2,9	123	48	18
4144504	VDS201A16670	4140244	VDS401A16670	16,670	.6563	51	73	2,9	123	48	18
4144505	VDS201A16700	4140245	VDS401A16700	16,700	.6575	51	73	2,9	123	48	18
4144506	VDS201A16800	4140246	VDS401A16800	16,800	.6614	51	73	2,9	123	48	18
4144507	VDS201A16900	4140247	VDS401A16900	16,900	.6654	51	73	2,9	123	48	18
4144508	VDS201A17000		–	17,000	.6693	51	73	3,0	123	48	18
	–	4140248	VDS401A17000	17,000	.6693	51	73	2,9	123	48	18
4144509	VDS201A17100	4140249	VDS401A17100	17,100	.6732	51	73	3,0	123	48	18
4144510	VDS201A17200	4140250	VDS401A17200	17,200	.6772	51	73	3,0	123	48	18
4144511	VDS201A17300	4140251	VDS401A17300	17,300	.6811	51	73	3,0	123	48	18
4144512	VDS201A17400	4140252	VDS401A17400	17,400	.6850	51	73	3,0	123	48	18
4144513	VDS201A17463	4140253	VDS401A17463	17,463	.6875	51	73	3,0	123	48	18
4144514	VDS201A17500	4140254	VDS401A17500	17,500	.6890	51	73	3,0	123	48	18
4144515	VDS201A17600	4140255	VDS401A17600	17,600	.6929	51	73	3,1	123	48	18
4144516	VDS201A17700	4140256	VDS401A17700	17,700	.6969	51	73	3,1	123	48	18
4144517	VDS201A17800	4140257	VDS401A17800	17,800	.7008	51	73	3,1	123	48	18
4144518	VDS201A17859		–	17,859	.7031	51	73	3,1	123	48	18
4144519	VDS201A17900		–	17,900	.7047	51	73	3,1	123	48	18
4144590	VDS201A18000	4140449	VDS401A18000	18,000	.7087	51	73	3,1	123	48	18
4144591	VDS201A18100	4140450	VDS401A18100	18,100	.7126	55	79	3,1	131	50	20
4144592	VDS201A18200	4140451	VDS401A18200	18,200	.7165	55	79	3,2	131	50	20
4144593	VDS201A18258	4140452	VDS401A18258	18,258	.7188	55	79	3,2	131	50	20
4144594	VDS201A18300	4140463	VDS401A18300	18,300	.7205	55	79	3,2	131	50	20
	–	4140464	VDS401A18400	18,400	.7244	55	79	3,2	131	50	20
4144596	VDS201A18500	4140465	VDS401A18500	18,500	.7283	55	79	3,2	131	50	20
4144597	VDS201A18600	4140466	VDS401A18600	18,600	.7323	55	79	3,2	131	50	20
4144598	VDS201A18654	4140467	VDS401A18654	18,654	.7344	55	79	3,2	131	50	20
4144599	VDS201A18700		–	18,700	.7362	55	79	3,3	131	50	20
	–	4140468	VDS401A18700	18,700	.7362	55	79	3,2	131	50	20
4144600	VDS201A18800	4140469	VDS401A18800	18,800	.7402	55	79	3,3	131	50	20
4144601	VDS201A18900	4140470	VDS401A18900	18,900	.7441	55	79	3,3	131	50	20
4144602	VDS201A19000	4140471	VDS401A19000	19,000	.7480	55	79	3,3	131	50	20
4144603	VDS201A19050	4140472	VDS401A19050	19,050	.7500	55	79	3,3	131	50	20
4144604	VDS201A19100	4140473	VDS401A19100	19,100	.7520	55	79	3,3	131	50	20
4144605	VDS201A19200	4140474	VDS401A19200	19,200	.7559	55	79	3,3	131	50	20

VariDrill • 3 x D • VDS201A / VDS401A • A-Shank

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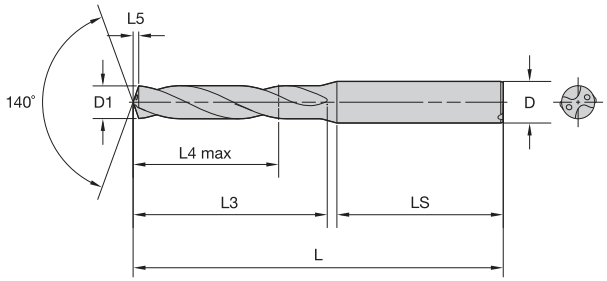
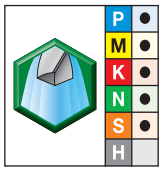
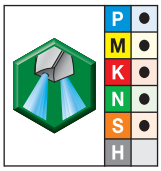


For information on L, L3, and L4 max, see page C29.

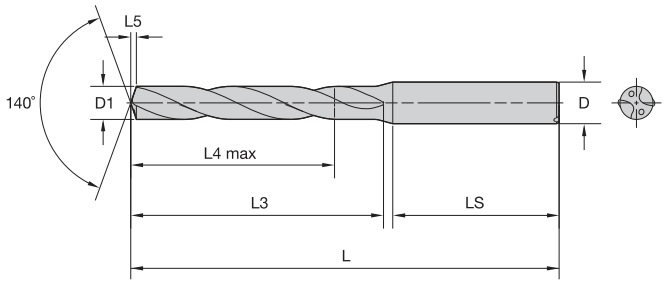




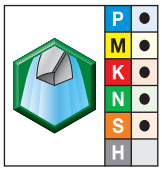
● first choice
○ alternate choice

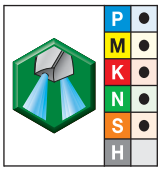
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144606	VDS201A19300	4140475	VDS401A19300	19,300	.7598	55	79	3,4	131	50	20
4144607	VDS201A19400	4140476	VDS401A19400	19,400	.7638	55	79	3,4	131	50	20
4144608	VDS201A19500	4140477	VDS401A19500	19,500	.7677	55	79	3,4	131	50	20
	–	4140478	VDS401A19600	19,600	.7717	55	79	3,4	131	50	20
4144610	VDS201A19700	4140479	VDS401A19700	19,700	.7756	55	79	3,4	131	50	20
4144611	VDS201A19800	4140480	VDS401A19800	19,800	.7795	55	79	3,4	131	50	20
4144612	VDS201A19900	4140481	VDS401A19900	19,900	.7835	55	79	3,5	131	50	20
4144613	VDS201A20000	4140482	VDS401A20000	20,000	.7874	55	79	3,5	131	50	20

VariDrill • 5 x D • VDS202A / VDS402A • A-Shank



For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148000	VDS202A01000		–	1,000	.0394	6	9	0,1	58	28	4
4148001	VDS202A01016		–	1,016	.0400	6	9	0,1	58	28	4
4148002	VDS202A01041		–	1,041	.0410	6	9	0,2	58	28	4
4148003	VDS202A01067		–	1,067	.0420	6	9	0,2	58	28	4
4148005	VDS202A01100		–	1,100	.0433	6	9	0,2	58	28	4
4148006	VDS202A01181		–	1,181	.0465	6	9	0,2	58	28	4
4148007	VDS202A01191		–	1,191	.0469	6	9	0,2	58	28	4
4148008	VDS202A01200		–	1,200	.0472	6	9	0,2	58	28	4
4148009	VDS202A01300		–	1,300	.0512	6	9	0,2	58	28	4
4148010	VDS202A01321		–	1,321	.0520	6	9	0,2	58	28	4
4148011	VDS202A01397		–	1,397	.0550	6	9	0,2	58	28	4
4148012	VDS202A01400		–	1,400	.0551	6	9	0,2	58	28	4
4148013	VDS202A01500	4142871	VDS402A01500	1,500	.0591	9	12	0,2	58	28	4
4148014	VDS202A01600	4142884	VDS402A01600	1,600	.0630	9	12	0,2	58	28	4
4148015	VDS202A01700	4142887	VDS402A01700	1,700	.0669	9	12	0,3	58	28	4
4148016	VDS202A01800	4142890	VDS402A01800	1,800	.0709	9	12	0,3	58	28	4
4148017	VDS202A01900	4142893	VDS402A01900	1,900	.0748	9	12	0,3	58	28	4
4148018	VDS202A01984	4142896	VDS402A01984	1,984	.0781	14	18	0,3	58	28	4
4148019	VDS202A02000	4142899	VDS402A02000	2,000	.0787	14	18	0,3	58	28	4
4148020	VDS202A02100	4142902	VDS402A02100	2,100	.0827	14	18	0,3	58	28	4
4148021	VDS202A02200	4142905	VDS402A02200	2,200	.0866	14	18	0,3	58	28	4
4148022	VDS202A02300	4142908	VDS402A02300	2,300	.0906	14	18	0,4	58	28	4
4148023	VDS202A02383	4142911	VDS402A02383	2,383	.0938	17	22	0,4	58	28	4
4148024	VDS202A02400	4142924	VDS402A02400	2,400	.0945	17	22	0,4	58	28	4
4148025	VDS202A02439	4142927	VDS402A02439	2,439	.0960	17	22	0,4	58	28	4
4148026	VDS202A02489	4142930	VDS402A02489	2,489	.0980	17	22	0,4	58	28	4
4148027	VDS202A02500	4142933	VDS402A02500	2,500	.0984	17	22	0,4	58	28	4
4148028	VDS202A02578	4142936	VDS402A02578	2,578	.1015	17	22	0,4	58	28	4
4148029	VDS202A02600	4142939	VDS402A02600	2,600	.1024	17	22	0,4	58	28	4
4148030	VDS202A02642	4142942	VDS402A02642	2,642	.1040	17	22	0,4	58	28	4
4148031	VDS202A02700	4142945	VDS402A02700	2,700	.1063	17	22	0,4	58	28	4
4148032	VDS202A02705		–	2,705	.1065	17	22	0,4	58	28	4
4148033	VDS202A02779	4142951	VDS402A02779	2,779	.1094	17	22	0,4	58	28	4
4148034	VDS202A02800	4142964	VDS402A02800	2,800	.1102	17	22	0,5	58	28	4
4148035	VDS202A02820	4142967	VDS402A02820	2,820	.1110	17	22	0,5	58	28	4
4148036	VDS202A02870	4142970	VDS402A02870	2,870	.1130	17	22	0,5	58	28	4
4148037	VDS202A02900	4142973	VDS402A02900	2,900	.1142	17	22	0,5	58	28	4
4148038	VDS202A02947	4142976	VDS402A02947	2,947	.1160	17	22	0,5	58	28	4
4148142	VDS202A03000	4142844	VDS402A03000	3,000	.1181	23	28	0,5	66	36	6
4148143	VDS202A03048	4142846	VDS402A03048	3,048	.1200	23	28	0,5	66	36	6
4148144	VDS202A03100	4142847	VDS402A03100	3,100	.1220	23	28	0,5	66	36	6
4148145	VDS202A03175	4142849	VDS402A03175	3,175	.1250	23	28	0,5	66	36	6
4148146	VDS202A03200	4142851	VDS402A03200	3,200	.1260	23	28	0,5	66	36	6
4148147	VDS202A03264	4142864	VDS402A03264	3,264	.1285	23	28	0,5	66	36	6
4148148	VDS202A03300	4142865	VDS402A03300	3,300	.1299	23	28	0,5	66	36	6
4148149	VDS202A03400	4142867	VDS402A03400	3,400	.1339	23	28	0,6	66	36	6
4148150	VDS202A03455	4142869	VDS402A03455	3,455	.1360	23	28	0,6	66	36	6
4148151	VDS202A03500	4142872	VDS402A03500	3,500	.1378	23	28	0,6	66	36	6
4148152	VDS202A03571	4142885	VDS402A03571	3,571	.1406	23	28	0,6	66	36	6
4148153	VDS202A03600	4142888	VDS402A03600	3,600	.1417	23	28	0,6	66	36	6
4148154	VDS202A03658	4142891	VDS402A03658	3,658	.1440	23	28	0,6	66	36	6
4148155	VDS202A03700	4142894	VDS402A03700	3,700	.1457	23	28	0,6	66	36	6

VariDrill • 5 x D • VDS202A / VDS402A • A-Shank

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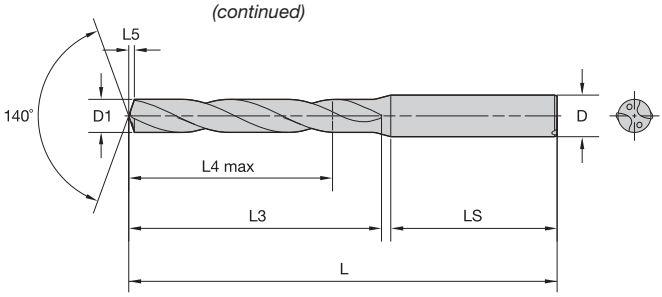
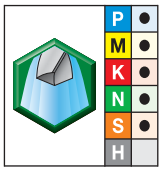
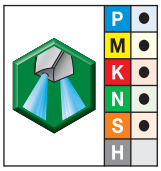


For information on L, L3, and L4 max, see page C29.



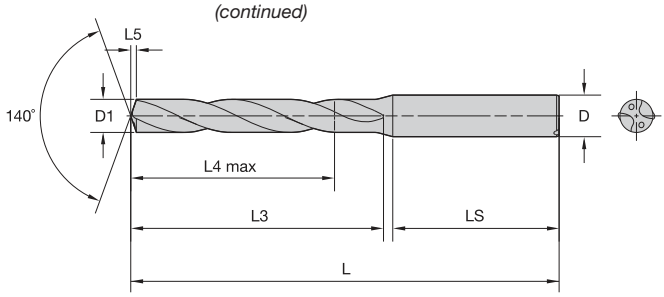


● first choice
○ alternate choice

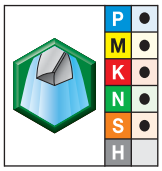
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148156	VDS202A03734	4142897	VDS402A03734	3,734	.1470	23	28	0,6	66	36	6
4148157	VDS202A03800	4142900	VDS402A03800	3,800	.1496	29	36	0,6	74	36	6
4148158	VDS202A03900	4142903	VDS402A03900	3,900	.1535	29	36	0,6	74	36	6
4148159	VDS202A03970	4142906	VDS402A03970	3,970	.1563	29	36	0,7	74	36	6
4148160	VDS202A04000	4142909	VDS402A04000	4,000	.1575	29	36	0,7	74	36	6
4148161	VDS202A04039	4142912	VDS402A04039	4,039	.1590	29	36	0,7	74	36	6
4148162	VDS202A04090	4142925	VDS402A04090	4,090	.1610	29	36	0,7	74	36	6
4148163	VDS202A04100	4142928	VDS402A04100	4,100	.1614	29	36	0,7	74	36	6
4148164	VDS202A04200	4142931	VDS402A04200	4,200	.1654	29	36	0,7	74	36	6
4148165	VDS202A04217	4142934	VDS402A04217	4,217	.1660	29	36	0,7	74	36	6
4148166	VDS202A04300	4142937	VDS402A04300	4,300	.1693	29	36	0,7	74	36	6
4148167	VDS202A04366	4142940	VDS402A04366	4,366	.1719	29	36	0,7	74	36	6
4148168	VDS202A04400	4142943	VDS402A04400	4,400	.1732	29	36	0,7	74	36	6
4148169	VDS202A04500	4142946	VDS402A04500	4,500	.1772	29	36	0,7	74	36	6
4148170	VDS202A04600	4142949	VDS402A04600	4,600	.1811	29	36	0,8	74	36	6
4148171	VDS202A04623	4142952	VDS402A04623	4,623	.1820	29	36	0,8	74	36	6
4148172	VDS202A04700	4142965	VDS402A04700	4,700	.1850	29	36	0,8	74	36	6
4148173	VDS202A04763	4142968	VDS402A04763	4,763	.1875	35	44	0,8	82	36	6
4148174	VDS202A04800	4142971	VDS402A04800	4,800	.1890	35	44	0,8	82	36	6
4148175	VDS202A04852	4142974	VDS402A04852	4,852	.1910	35	44	0,8	82	36	6
4148176	VDS202A04900	4142977	VDS402A04900	4,900	.1929	35	44	0,8	82	36	6
4148177	VDS202A05000	4142979	VDS402A05000	5,000	.1969	35	44	0,8	82	36	6
4148178	VDS202A05100	4142981	VDS402A05100	5,100	.2008	35	44	0,9	82	36	6
4148179	VDS202A05106	4142994	VDS402A05106	5,106	.2010	35	44	0,9	82	36	6
4148180	VDS202A05159	4142996	VDS402A05159	5,159	.2031	35	44	0,9	82	36	6
4148181	VDS202A05200	4142997	VDS402A05200	5,200	.2047	35	44	0,9	82	36	6
4148182	VDS202A05300	4142999	VDS402A05300	5,300	.2087	35	44	0,9	82	36	6
4148183	VDS202A05400	4143000	VDS402A05400	5,400	.2126	35	44	0,9	82	36	6
4148184	VDS202A05410	4143001	VDS402A05410	5,410	.2130	35	44	0,9	82	36	6
4148185	VDS202A05500	4143002	VDS402A05500	5,500	.2165	35	44	0,9	82	36	6
4148186	VDS202A05558	4143003	VDS402A05558	5,558	.2188	35	44	0,9	82	36	6
4148187	VDS202A05600	4143004	VDS402A05600	5,600	.2205	35	44	0,9	82	36	6
4148188	VDS202A05616	4143005	VDS402A05616	5,616	.2211	35	44	0,9	82	36	6
4148189	VDS202A05700	4143006	VDS402A05700	5,700	.2244	35	44	1,0	82	36	6
4148190	VDS202A05800	4143007	VDS402A05800	5,800	.2283	35	44	1,0	82	36	6
4148191	VDS202A05900	4143008	VDS402A05900	5,900	.2323	35	44	1,0	82	36	6
4148192	VDS202A05954	4143009	VDS402A05954	5,954	.2344	35	44	1,0	82	36	6
4148193	VDS202A06000	4143010	VDS402A06000	6,000	.2362	35	44	1,0	82	36	6
4148194	VDS202A06100	4143011	VDS402A06100	6,100	.2402	43	53	1,0	91	36	8
4148195	VDS202A06200	4143012	VDS402A06200	6,200	.2441	43	53	1,0	91	36	8
4148196	VDS202A06300	4143023	VDS402A06300	6,300	.2480	43	53	1,1	91	36	8
4148197	VDS202A06350	4143024	VDS402A06350	6,350	.2500	43	53	1,1	91	36	8
4148198	VDS202A06400	4143025	VDS402A06400	6,400	.2520	43	53	1,1	91	36	8
4148199	VDS202A06500	4143026	VDS402A06500	6,500	.2559	43	53	1,1	91	36	8
4148200	VDS202A06528	4143027	VDS402A06528	6,528	.2570	43	53	1,1	91	36	8
4148201	VDS202A06600	4143028	VDS402A06600	6,600	.2598	43	53	1,1	91	36	8
4148202	VDS202A06630	4143029	VDS402A06630	6,630	.2610	43	53	1,1	91	36	8
4148203	VDS202A06700	4143030	VDS402A06700	6,700	.2638	43	53	1,1	91	36	8
4148204	VDS202A06746	4143031	VDS402A06746	6,746	.2656	43	53	1,1	91	36	8
4148205	VDS202A06800	4143032	VDS402A06800	6,800	.2677	43	53	1,1	91	36	8
4148206	VDS202A06900	4143043	VDS402A06900	6,900	.2717	43	53	1,2	91	36	8
4148207	VDS202A07000	4143044	VDS402A07000	7,000	.2756	43	53	1,2	91	36	8

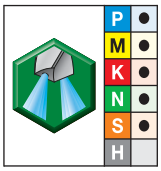
VariDrill • 5 x D • VDS202A / VDS402A • A-Shank

(continued)



For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148208	VDS202A07100	4143045	VDS402A07100	7,100	.2795	43	53	1,2	91	36	8
4148209	VDS202A07145	4143046	VDS402A07145	7,145	.2813	43	53	1,2	91	36	8
4148210	VDS202A07200	4143047	VDS402A07200	7,200	.2835	43	53	1,2	91	36	8
4148211	VDS202A07300	4143048	VDS402A07300	7,300	.2874	43	53	1,2	91	36	8
4148212	VDS202A07400	4143049	VDS402A07400	7,400	.2913	43	53	1,3	91	36	8
4148213	VDS202A07500	4143050	VDS402A07500	7,500	.2953	43	53	1,3	91	36	8
4148214	VDS202A07541	4143051	VDS402A07541	7,541	.2969	43	53	1,3	91	36	8
4148215	VDS202A07600	4143052	VDS402A07600	7,600	.2992	43	53	1,3	91	36	8
4148216	VDS202A07700	4143063	VDS402A07700	7,700	.3031	43	53	1,3	91	36	8
4148217	VDS202A07800	4143064	VDS402A07800	7,800	.3071	43	53	1,3	91	36	8
4148218	VDS202A07900	4143065	VDS402A07900	7,900	.3110	43	53	1,3	91	36	8
4148219	VDS202A07938	4143066	VDS402A07938	7,938	.3125	43	53	1,3	91	36	8
4148220	VDS202A08000	4143067	VDS402A08000	8,000	.3150	43	53	1,4	91	36	8
4148221	VDS202A08100	4143068	VDS402A08100	8,100	.3189	49	61	1,4	103	40	10
4148222	VDS202A08200	4143069	VDS402A08200	8,200	.3228	49	61	1,4	103	40	10
4148223	VDS202A08300	4143070	VDS402A08300	8,300	.3268	49	61	1,4	103	40	10
4148224	VDS202A08334	4143071	VDS402A08334	8,334	.3281	49	61	1,4	103	40	10
4148225	VDS202A08400	4143072	VDS402A08400	8,400	.3307	49	61	1,4	103	40	10
4148226	VDS202A08433	4143083	VDS402A08433	8,433	.3320	49	61	1,4	103	40	10
4148227	VDS202A08500	4143084	VDS402A08500	8,500	.3346	49	61	1,4	103	40	10
4148228	VDS202A08600	4143085	VDS402A08600	8,600	.3386	49	61	1,5	103	40	10
4148229	VDS202A08700	4143086	VDS402A08700	8,700	.3425	49	61	1,5	103	40	10
4148230	VDS202A08733	4143087	VDS402A08733	8,733	.3438	49	61	1,5	103	40	10
4148231	VDS202A08800	4143088	VDS402A08800	8,800	.3465	49	61	1,5	103	40	10
4148232	VDS202A08900	4143089	VDS402A08900	8,900	.3504	49	61	1,5	103	40	10
4148233	VDS202A09000	4143090	VDS402A09000	9,000	.3543	49	61	1,5	103	40	10
4148234	VDS202A09100	4143091	VDS402A09100	9,100	.3583	49	61	1,6	103	40	10
4148235	VDS202A09129	4143092	VDS402A09129	9,129	.3594	49	61	1,6	103	40	10
4148236	VDS202A09200	4143103	VDS402A09200	9,200	.3622	49	61	1,6	103	40	10
4148237	VDS202A09300	4143104	VDS402A09300	9,300	.3661	49	61	1,6	103	40	10
4148238	VDS202A09347	4143105	VDS402A09347	9,347	.3680	49	61	1,6	103	40	10
4148239	VDS202A09400	4143106	VDS402A09400	9,400	.3701	49	61	1,6	103	40	10
4148240	VDS202A09500	4143107	VDS402A09500	9,500	.3740	49	61	1,6	103	40	10
4148241	VDS202A09525	4143108	VDS402A09525	9,525	.3750	49	61	1,6	103	40	10
4148242	VDS202A09600	4143109	VDS402A09600	9,600	.3780	49	61	1,6	103	40	10
4148243	VDS202A09700	4143110	VDS402A09700	9,700	.3819	49	61	1,7	103	40	10
4148244	VDS202A09800	4143111	VDS402A09800	9,800	.3858	49	61	1,7	103	40	10
4148245	VDS202A09900	4143112	VDS402A09900	9,900	.3898	49	61	1,7	103	40	10
4148246	VDS202A09921	4143113	VDS402A09921	9,921	.3906	49	61	1,7	103	40	10
4148258	VDS202A10000	4142823	VDS402A10000	10,000	.3937	49	61	1,7	103	40	10
4148259	VDS202A10100	4142825	VDS402A10100	10,100	.3976	56	71	1,7	118	45	12
4148260	VDS202A10200	4142827	VDS402A10200	10,200	.4016	56	71	1,7	118	45	12
4148261	VDS202A10300	4142829	VDS402A10300	10,300	.4055	56	71	1,8	118	45	12
4148262	VDS202A10320	4142831	VDS402A10320	10,320	.4063	56	71	1,8	118	45	12
4148283	VDS202A10400	4142832	VDS402A10400	10,400	.4094	56	71	1,8	118	45	12
4148284	VDS202A10500	4142834	VDS402A10500	10,500	.4134	56	71	1,8	118	45	12
4148285	VDS202A10600	4142836	VDS402A10600	10,600	.4173	56	71	1,8	118	45	12
4148286	VDS202A10700	4142838	VDS402A10700	10,700	.4213	56	71	1,8	118	45	12
4148287	VDS202A10716	4142840	VDS402A10716	10,716	.4219	56	71	1,8	118	45	12
4148288	VDS202A10800	4142842	VDS402A10800	10,800	.4252	56	71	1,9	118	45	12
4148289	VDS202A10900	4142855	VDS402A10900	10,900	.4291	56	71	1,9	118	45	12
4148290	VDS202A11000	4142857	VDS402A11000	11,000	.4331	56	71	1,9	118	45	12

VariDrill • 5 x D • VDS202A / VDS402A • A-Shank

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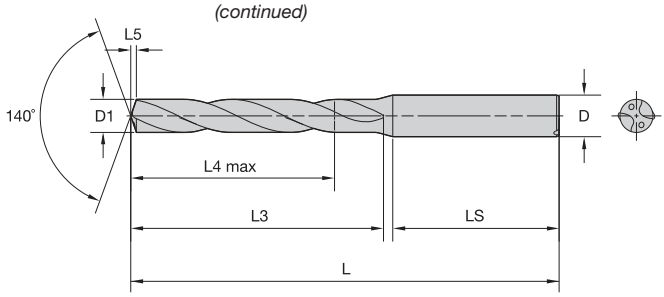
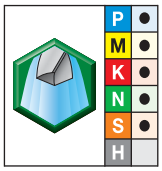
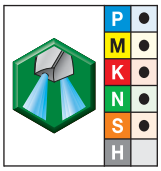


For information on L, L3, and L4 max, see page C29.





● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148291	VDS202A11100	4142858	VDS402A11100	11,100	.4370	56	71	1,9	118	45	12
4148292	VDS202A11113	4142861	VDS402A11113	11,113	.4375	56	71	1,9	118	45	12
4148293	VDS202A11200	4142862	VDS402A11200	11,200	.4409	56	71	1,9	118	45	12
4148294	VDS202A11300	4142873	VDS402A11300	11,300	.4449	56	71	1,9	118	45	12
4148295	VDS202A11400	4142874	VDS402A11400	11,400	.4488	56	71	2,0	118	45	12
4148296	VDS202A11500	4142875	VDS402A11500	11,500	.4528	56	71	2,0	118	45	12
4148297	VDS202A11509	4142876	VDS402A11509	11,509	.4531	56	71	2,0	118	45	12
4148298	VDS202A11600	4142877	VDS402A11600	11,600	.4567	56	71	2,0	118	45	12
4148299	VDS202A11700	4142878	VDS402A11700	11,700	.4606	56	71	2,0	118	45	12
4148300	VDS202A11800	4142879	VDS402A11800	11,800	.4646	56	71	2,0	118	45	12
4148301	VDS202A11900	4142880	VDS402A11900	11,900	.4685	56	71	2,0	118	45	12
4148302	VDS202A11908	4142881	VDS402A11908	11,908	.4688	56	71	2,0	118	45	12
4148313	VDS202A12000	4142882	VDS402A12000	12,000	.4724	56	71	2,1	118	45	12
4148314	VDS202A12100	4142913	VDS402A12100	12,100	.4764	60	77	2,1	124	45	14
4148315	VDS202A12200	4142914	VDS402A12200	12,200	.4803	60	77	2,1	124	45	14
4148316	VDS202A12300	4142915	VDS402A12300	12,300	.4843	60	77	2,1	124	45	14
4148317	VDS202A12304	4142916	VDS402A12304	12,304	.4844	60	77	2,1	124	45	14
4148318	VDS202A12400	4142917	VDS402A12400	12,400	.4882	60	77	2,1	124	45	14
4148319	VDS202A12500	4142918	VDS402A12500	12,500	.4921	60	77	2,2	124	45	14
4148320	VDS202A12600	4142919	VDS402A12600	12,600	.4961	60	77	2,2	124	45	14
4148321	VDS202A12700	4142920	VDS402A12700	12,700	.5000	60	77	2,2	124	45	14
4148322	VDS202A12800	4142921	VDS402A12800	12,800	.5039	60	77	2,2	124	45	14
4148343	VDS202A12900	4142922	VDS402A12900	12,900	.5079	60	77	2,2	124	45	14
4148344	VDS202A13000	4142953	VDS402A13000	13,000	.5118	60	77	2,2	124	45	14
4148345	VDS202A13096	4142954	VDS402A13096	13,096	.5156	60	77	2,3	124	45	14
4148346	VDS202A13100	4142955	VDS402A13100	13,100	.5157	60	77	2,3	124	45	14
4148347	VDS202A13200	4142956	VDS402A13200	13,200	.5197	60	77	2,3	124	45	14
4148348	VDS202A13300	4142957	VDS402A13300	13,300	.5236	60	77	2,3	124	45	14
4148349	VDS202A13400	4142958	VDS402A13400	13,400	.5276	60	77	2,3	124	45	14
4148350	VDS202A13500	4142959	VDS402A13500	13,500	.5315	60	77	2,3	124	45	14
4148351	VDS202A13600	4142960	VDS402A13600	13,600	.5354	60	77	2,3	124	45	14
4148352	VDS202A13700	4142961	VDS402A13700	13,700	.5394	60	77	2,4	124	45	14
4148353	VDS202A13800	4142962	VDS402A13800	13,800	.5433	60	77	2,4	124	45	14
4148354	VDS202A13891	4142983	VDS402A13891	13,891	.5469	60	77	2,4	124	45	14
4148355	VDS202A13900	4142984	VDS402A13900	13,900	.5472	60	77	2,4	124	45	14
4148356	VDS202A14000	4142985	VDS402A14000	14,000	.5512	60	77	2,4	124	45	14
4148357	VDS202A14100	4142986	VDS402A14100	14,100	.5551	63	83	2,4	133	48	16
4148358	VDS202A14200	4142987	VDS402A14200	14,200	.5591	63	83	2,5	133	48	16
4148359	VDS202A14288	4142988	VDS402A14288	14,288	.5625	63	83	2,5	133	48	16
4148360	VDS202A14300	4142989	VDS402A14300	14,300	.5630	63	83	2,5	133	48	16
4148361	VDS202A14400	4142990	VDS402A14400	14,400	.5669	63	83	2,5	133	48	16
4148362	VDS202A14500	4142991	VDS402A14500	14,500	.5709	63	83	2,5	133	48	16
4148363	VDS202A14600	4142992	VDS402A14600	14,600	.5748	63	83	2,5	133	48	16
4148364	VDS202A14684	4143013	VDS402A14684	14,684	.5781	63	83	2,5	133	48	16
4148365	VDS202A14700	4143014	VDS402A14700	14,700	.5787	63	83	2,5	133	48	16
4148366	VDS202A14800	4143015	VDS402A14800	14,800	.5827	63	83	2,6	133	48	16
4148367	VDS202A14900	4143016	VDS402A14900	14,900	.5866	63	83	2,6	133	48	16
4148368	VDS202A15000	4143017	VDS402A15000	15,000	.5906	63	83	2,6	133	48	16
4148369	VDS202A15083	4143018	VDS402A15083	15,083	.5938	63	83	2,6	133	48	16
4148370	VDS202A15100	4143019	VDS402A15100	15,100	.5945	63	83	2,6	133	48	16
4148371	VDS202A15200	4143020	VDS402A15200	15,200	.5984	63	83	2,6	133	48	16
4148372	VDS202A15300	4143021	VDS402A15300	15,300	.6024	63	83	2,6	133	48	16

VariDrill • 5 x D • VDS202A / VDS402A • A-Shank

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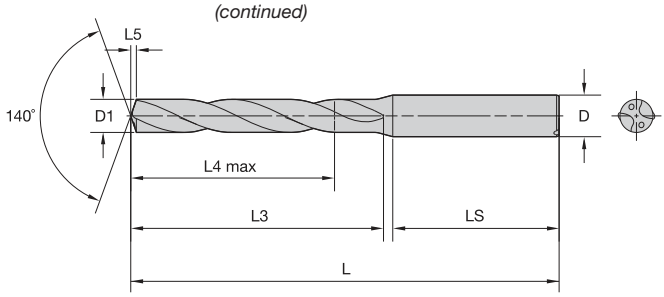
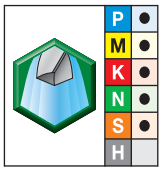
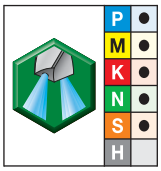


For information on L, L3, and L4 max, see page C29.



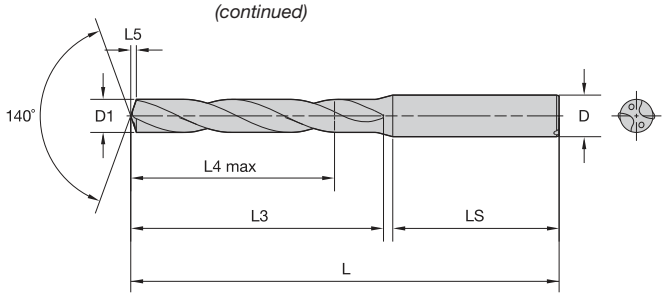


● first choice
○ alternate choice

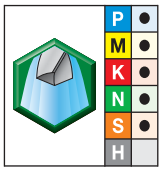
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
	–	4143022	VDS402A15400	15,400	.6063	63	83	2,7	133	48	16
	–	4143033	VDS402A15479	15,479	.6094	63	83	2,7	133	48	16
4148375	VDS202A15500	4143034	VDS402A15500	15,500	.6102	63	83	2,7	133	48	16
4148376	VDS202A15600	4143035	VDS402A15600	15,600	.6142	63	83	2,7	133	48	16
4148377	VDS202A15700	4143036	VDS402A15700	15,700	.6181	63	83	2,7	133	48	16
4148378	VDS202A15800	4143037	VDS402A15800	15,800	.6220	63	83	2,7	133	48	16
4148379	VDS202A15875	4143038	VDS402A15875	15,875	.6250	63	83	2,8	133	48	16
4148380	VDS202A15900	4143039	VDS402A15900	15,900	.6260	63	83	2,8	133	48	16
4148381	VDS202A16000	4143040	VDS402A16000	16,000	.6299	63	83	2,8	133	48	16
4148382	VDS202A16100	4143041	VDS402A16100	16,100	.6339	71	93	2,8	143	48	18
4148383	VDS202A16200	4143042	VDS402A16200	16,200	.6378	71	93	2,8	143	48	18
4148384	VDS202A16271	4143053	VDS402A16271	16,271	.6406	71	93	2,8	143	48	18
4148385	VDS202A16300	4143054	VDS402A16300	16,300	.6417	71	93	2,8	143	48	18
	–	4143055	VDS402A16400	16,400	.6457	71	93	2,8	143	48	18
4148387	VDS202A16500	4143056	VDS402A16500	16,500	.6496	71	93	2,9	143	48	18
4148388	VDS202A16600	4143057	VDS402A16600	16,600	.6535	71	93	2,9	143	48	18
4148389	VDS202A16670	4143058	VDS402A16670	16,670	.6563	71	93	2,9	143	48	18
	–	4143059	VDS402A16700	16,700	.6575	71	93	2,9	143	48	18
4148391	VDS202A16800	4143060	VDS402A16800	16,800	.6614	71	93	2,9	143	48	18
	–	4143061	VDS402A16900	16,900	.6654	71	93	2,9	143	48	18
4148393	VDS202A17000	4143062	VDS402A17000	17,000	.6693	71	93	3,0	143	48	18
4148394	VDS202A17100	4143073	VDS402A17100	17,100	.6732	71	93	3,0	143	48	18
	–	4143074	VDS402A17200	17,200	.6772	71	93	3,0	143	48	18
4148396	VDS202A17300	4143075	VDS402A17300	17,300	.6811	71	93	3,0	143	48	18
	–	4143076	VDS402A17400	17,400	.6850	71	93	3,0	143	48	18
4148398	VDS202A17463	4143077	VDS402A17463	17,463	.6875	71	93	3,0	143	48	18
4148399	VDS202A17500	4143078	VDS402A17500	17,500	.6890	71	93	3,0	143	48	18
4148400	VDS202A17600	4143079	VDS402A17600	17,600	.6929	71	93	3,1	143	48	18
4148401	VDS202A17700	4143080	VDS402A17700	17,700	.6969	71	93	3,1	143	48	18
4148402	VDS202A17800	4143081	VDS402A17800	17,800	.7008	71	93	3,1	143	48	18
	–	4143082	VDS402A17859	17,859	.7031	71	93	3,1	143	48	18
	–	4143093	VDS402A17900	17,900	.7047	71	93	3,1	143	48	18
4147921	VDS202A18000	4142803	VDS402A18000	18,000	.7087	71	93	3,1	143	48	18
4147922	VDS202A18100	4142804	VDS402A18100	18,100	.7126	77	101	3,1	153	50	20
4148303	VDS202A18200	4142805	VDS402A18200	18,200	.7165	77	101	3,2	153	50	20
4148304	VDS202A18258	4142806	VDS402A18258	18,258	.7188	77	101	3,2	153	50	20
	–	4142807	VDS402A18300	18,300	.7205	77	101	3,2	153	50	20
	–	4142808	VDS402A18400	18,400	.7244	77	101	3,2	153	50	20
4148307	VDS202A18500	4142809	VDS402A18500	18,500	.7283	77	101	3,2	153	50	20
	–	4142810	VDS402A18600	18,600	.7323	77	101	3,2	153	50	20
	–	4142811	VDS402A18654	18,654	.7344	77	101	3,2	153	50	20
	–	4142812	VDS402A18700	18,700	.7362	77	101	3,3	153	50	20
4148311	VDS202A18800	4142824	VDS402A18800	18,800	.7402	77	101	3,3	153	50	20
	–	4142826	VDS402A18900	18,900	.7441	77	101	3,3	153	50	20
4148323	VDS202A19000	4142828	VDS402A19000	19,000	.7480	77	101	3,3	153	50	20
4148324	VDS202A19050	4142830	VDS402A19050	19,050	.7500	77	101	3,3	153	50	20
4148325	VDS202A19100	4142833	VDS402A19100	19,100	.7520	77	101	3,3	153	50	20
	–	4142835	VDS402A19200	19,200	.7559	77	101	3,3	153	50	20
4148327	VDS202A19300	4142837	VDS402A19300	19,300	.7598	77	101	3,4	153	50	20
4148328	VDS202A19400	4142839	VDS402A19400	19,400	.7638	77	101	3,4	153	50	20
4148329	VDS202A19500	4142841	VDS402A19500	19,500	.7677	77	101	3,4	153	50	20
	–	4142853	VDS402A19600	19,600	.7717	77	101	3,4	153	50	20

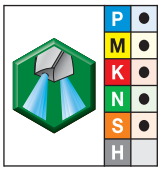
VariDrill • 5 x D • VDS202A / VDS402A • A-Shank

(continued)



For information on L, L3, and L4 max, see page C29.

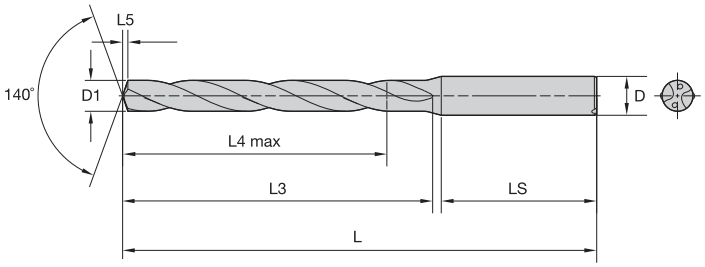




● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
	–	4142854	VDS402A19700	19,700	.7756	77	101	3,4	153	50	20
4148332	VDS202A19800	4142856	VDS402A19800	19,800	.7795	77	101	3,4	153	50	20
4148333	VDS202A19900	4142859	VDS402A19900	19,900	.7835	77	101	3,5	153	50	20
4148334	VDS202A20000	4142860	VDS402A20000	20,000	.7874	77	101	3,5	153	50	20

VariDrill • 8 x D • VDS403A • A-Shank



For information on L, L3, and L4 max, see page C29.

● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
6023126	VDS403A01000	1,000	.0394	10	12	0,2	58	28	4
6023129	VDS403A01100	1,100	.0433	10	12	0,2	58	28	4
6023132	VDS403A01200	1,200	.0472	10	12	0,2	58	28	4
6023133	VDS403A01300	1,300	.0512	10	12	0,2	58	28	4
6023134	VDS403A01321	1,321	.0520	10	12	0,2	58	28	4
6023136	VDS403A01400	1,400	.0551	10	12	0,2	58	28	4
4143700	VDS403A01500	1,500	.0591	15	18	0,2	58	28	4
4143701	VDS403A01600	1,600	.0630	15	18	0,2	58	28	4
4143702	VDS403A01700	1,700	.0669	15	18	0,3	58	28	4
4143723	VDS403A01800	1,800	.0709	15	18	0,3	58	28	4
4143724	VDS403A01900	1,900	.0748	15	18	0,3	58	28	4
4143725	VDS403A01984	1,984	.0781	22	26	0,3	66	28	4
4143726	VDS403A02000	2,000	.0787	22	26	0,3	66	28	4
4143727	VDS403A02100	2,100	.0827	22	26	0,3	66	28	4
4143728	VDS403A02200	2,200	.0866	22	26	0,3	66	28	4
4143729	VDS403A02300	2,300	.0906	22	26	0,4	66	28	4
4143730	VDS403A02383	2,383	.0938	25	30	0,4	66	28	4
4143731	VDS403A02400	2,400	.0945	25	30	0,4	66	28	4
4143732	VDS403A02439	2,439	.0960	25	30	0,4	66	28	4
4143733	VDS403A02489	2,489	.0980	25	30	0,4	66	28	4
4143734	VDS403A02500	2,500	.0984	25	30	0,4	66	28	4
4143735	VDS403A02578	2,578	.1015	25	30	0,4	66	28	4
4143736	VDS403A02600	2,600	.1024	25	30	0,4	66	28	4
4143737	VDS403A02642	2,642	.1040	25	30	0,4	66	28	4
4143738	VDS403A02700	2,700	.1063	25	30	0,4	66	28	4
4143739	VDS403A02705	2,705	.1065	25	30	0,4	66	28	4
4143740	VDS403A02779	2,779	.1094	25	30	0,5	66	28	4
4143741	VDS403A02800	2,800	.1102	25	30	0,5	66	28	4
4143742	VDS403A02820	2,820	.1110	25	30	0,5	66	28	4
4143743	VDS403A02870	2,870	.1130	25	30	0,5	66	28	4
4143744	VDS403A02900	2,900	.1142	25	30	0,5	66	28	4
4143745	VDS403A02947	2,947	.1160	25	30	0,5	66	28	4
4143746	VDS403A03000	3,000	.1181	33	40	0,5	78	36	6
4143747	VDS403A03048	3,048	.1200	33	40	0,5	78	36	6
4143748	VDS403A03100	3,100	.1220	33	40	0,5	78	36	6
4143749	VDS403A03175	3,175	.1250	33	40	0,5	78	36	6
4143750	VDS403A03200	3,200	.1260	33	40	0,5	78	36	6
4143751	VDS403A03264	3,264	.1285	33	40	0,5	78	36	6
4143752	VDS403A03300	3,300	.1299	33	40	0,5	78	36	6
4143753	VDS403A03400	3,400	.1339	33	40	0,6	78	36	6
4143754	VDS403A03455	3,455	.1360	33	40	0,6	78	36	6
4143755	VDS403A03500	3,500	.1378	33	40	0,6	78	36	6
4143756	VDS403A03571	3,571	.1406	33	40	0,6	78	36	6
4143757	VDS403A03600	3,600	.1417	33	40	0,6	78	36	6
4143758	VDS403A03658	3,658	.1440	33	40	0,6	78	36	6
4143759	VDS403A03700	3,700	.1457	33	40	0,6	78	36	6
4143760	VDS403A03734	3,734	.1470	33	40	0,6	78	36	6
4143761	VDS403A03800	3,800	.1496	41	49	0,6	87	36	6
4143762	VDS403A03900	3,900	.1535	41	49	0,6	87	36	6
4143763	VDS403A03970	3,970	.1563	41	49	0,7	87	36	6
4143764	VDS403A04000	4,000	.1575	41	49	0,7	87	36	6
4143765	VDS403A04039	4,039	.1590	41	49	0,7	87	36	6

VariDrill • 8 x D • VDS403A • A-Shank

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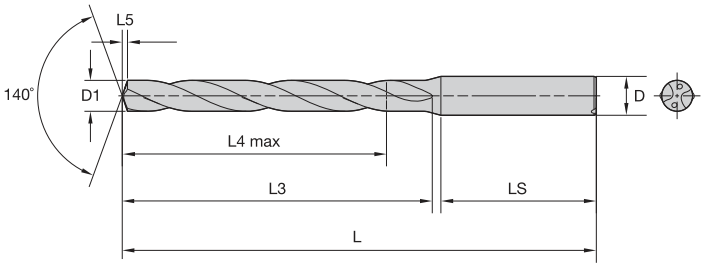
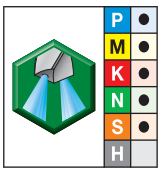


For information on L, L3, and L4 max, see page C29.



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143766	VDS403A04090	4,090	.1610	41	49	0,7	87	36	6
4143767	VDS403A04100	4,100	.1614	41	49	0,7	87	36	6
4143768	VDS403A04200	4,200	.1654	41	49	0,7	87	36	6
4143769	VDS403A04217	4,217	.1660	41	49	0,7	87	36	6
4143770	VDS403A04300	4,300	.1693	41	49	0,7	87	36	6
4143771	VDS403A04366	4,366	.1719	41	49	0,7	87	36	6
4143772	VDS403A04400	4,400	.1732	41	49	0,7	87	36	6
4143773	VDS403A04500	4,500	.1772	41	49	0,7	87	36	6
4143774	VDS403A04600	4,600	.1811	41	49	0,8	87	36	6
4143775	VDS403A04623	4,623	.1820	41	49	0,8	87	36	6
4143776	VDS403A04700	4,700	.1850	41	49	0,8	87	36	6
4143777	VDS403A04763	4,763	.1875	48	56	0,8	94	36	6
4143778	VDS403A04800	4,800	.1890	48	56	0,8	94	36	6
4143779	VDS403A04852	4,852	.1910	48	56	0,8	94	36	6
4143780	VDS403A04900	4,900	.1929	48	56	0,8	94	36	6
4143781	VDS403A05000	5,000	.1969	48	56	0,8	94	36	6
4143782	VDS403A05100	5,100	.2008	48	56	0,9	94	36	6
4143783	VDS403A05106	5,106	.2010	48	56	0,9	94	36	6
4143784	VDS403A05159	5,159	.2031	48	56	0,9	94	36	6
4143785	VDS403A05200	5,200	.2047	48	56	0,9	94	36	6
4143786	VDS403A05300	5,300	.2087	48	56	0,9	94	36	6
4143787	VDS403A05400	5,400	.2126	48	56	0,9	94	36	6
4143788	VDS403A05410	5,410	.2130	48	56	0,9	94	36	6
4143789	VDS403A05500	5,500	.2165	48	56	0,9	94	36	6
4143790	VDS403A05558	5,558	.2188	48	56	0,9	94	36	6
4143791	VDS403A05600	5,600	.2205	48	56	0,9	94	36	6
4143792	VDS403A05616	5,616	.2211	48	56	0,9	94	36	6
4143793	VDS403A05700	5,700	.2244	48	56	1,0	94	36	6
4143794	VDS403A05800	5,800	.2283	48	56	1,0	94	36	6
4143795	VDS403A05900	5,900	.2323	48	56	1,0	94	36	6
4143796	VDS403A05954	5,954	.2344	48	56	1,0	94	36	6
4143797	VDS403A06000	6,000	.2362	48	56	1,0	94	36	6
4143798	VDS403A06100	6,100	.2402	57	67	1,0	105	36	8
4143799	VDS403A06200	6,200	.2441	57	67	1,0	105	36	8
4143800	VDS403A06300	6,300	.2480	57	67	1,1	105	36	8
4143801	VDS403A06350	6,350	.2500	57	67	1,1	105	36	8
4143802	VDS403A06400	6,400	.2520	57	67	1,1	105	36	8
4143803	VDS403A06500	6,500	.2559	57	67	1,1	105	36	8
4143804	VDS403A06528	6,528	.2570	57	67	1,1	105	36	8
4143805	VDS403A06600	6,600	.2598	57	67	1,1	105	36	8
4143806	VDS403A06630	6,630	.2610	57	67	1,1	105	36	8
4143807	VDS403A06700	6,700	.2638	57	67	1,1	105	36	8
4143808	VDS403A06746	6,746	.2656	57	67	1,1	105	36	8
4143809	VDS403A06800	6,800	.2677	57	67	1,1	105	36	8
4143810	VDS403A06900	6,900	.2717	57	67	1,2	105	36	8
4143811	VDS403A07000	7,000	.2756	57	67	1,2	105	36	8
4143812	VDS403A07100	7,100	.2795	64	74	1,2	113	36	8
4143813	VDS403A07145	7,145	.2813	64	74	1,2	113	36	8
4143814	VDS403A07200	7,200	.2835	64	74	1,2	113	36	8
4143815	VDS403A07300	7,300	.2874	64	74	1,2	113	36	8
4143816	VDS403A07400	7,400	.2913	64	74	1,3	113	36	8
4143817	VDS403A07500	7,500	.2953	64	74	1,3	113	36	8

VariDrill • 8 x D • VDS403A • A-Shank

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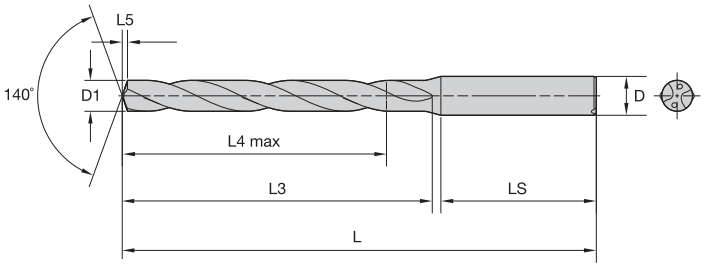


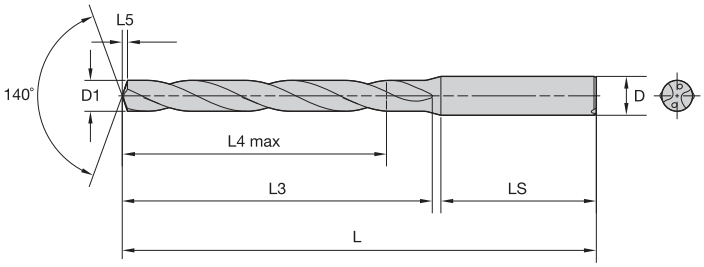
For information on L, L3, and L4 max, see page C29.

● first choice
○ alternate choice

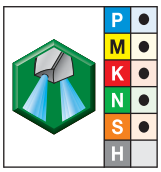
grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143818	VDS403A07541	7,541	.2969	64	74	1,3	113	36	8
4143819	VDS403A07600	7,600	.2992	64	74	1,3	113	36	8
4143820	VDS403A07700	7,700	.3031	64	74	1,3	113	36	8
4143821	VDS403A07800	7,800	.3071	64	74	1,3	113	36	8
4143822	VDS403A07900	7,900	.3110	64	74	1,3	113	36	8
4143823	VDS403A07938	7,938	.3125	64	74	1,3	113	36	8
4143824	VDS403A08000	8,000	.3150	64	74	1,4	113	36	8
4143825	VDS403A08100	8,100	.3189	80	92	1,4	135	40	10
4143826	VDS403A08200	8,200	.3228	80	92	1,4	135	40	10
4143827	VDS403A08300	8,300	.3268	80	92	1,4	135	40	10
4143828	VDS403A08334	8,334	.3281	80	92	1,4	135	40	10
4143829	VDS403A08400	8,400	.3307	80	92	1,4	135	40	10
4143830	VDS403A08433	8,433	.3320	80	92	1,4	135	40	10
4143831	VDS403A08500	8,500	.3346	80	92	1,4	135	40	10
4143832	VDS403A08600	8,600	.3386	80	92	1,5	135	40	10
4143833	VDS403A08700	8,700	.3425	80	92	1,5	135	40	10
4143834	VDS403A08733	8,733	.3438	80	92	1,5	135	40	10
4143835	VDS403A08800	8,800	.3465	80	92	1,5	135	40	10
4143836	VDS403A08900	8,900	.3504	80	92	1,5	135	40	10
4143837	VDS403A09000	9,000	.3543	80	92	1,5	135	40	10
4143838	VDS403A09100	9,100	.3583	80	92	1,6	135	40	10
4143839	VDS403A09129	9,129	.3594	80	92	1,6	135	40	10
4143840	VDS403A09200	9,200	.3622	80	92	1,6	135	40	10
4143841	VDS403A09300	9,300	.3661	80	92	1,6	135	40	10
4143842	VDS403A09347	9,347	.3680	80	92	1,6	135	40	10
4143843	VDS403A09400	9,400	.3701	80	92	1,6	135	40	10
4143844	VDS403A09500	9,500	.3740	80	92	1,6	135	40	10
4143845	VDS403A09525	9,525	.3750	80	92	1,6	135	40	10
4143846	VDS403A09600	9,600	.3780	80	92	1,6	135	40	10
4143847	VDS403A09700	9,700	.3819	80	92	1,7	135	40	10
4143848	VDS403A09800	9,800	.3858	80	92	1,7	135	40	10
4143849	VDS403A09900	9,900	.3898	80	92	1,7	135	40	10
4143850	VDS403A09921	9,921	.3906	68	80	1,7	122	40	10
4143421	VDS403A10000	10,000	.3937	80	92	1,7	135	40	10
4143422	VDS403A10100	10,100	.3976	96	110	1,7	158	45	12
4143473	VDS403A10200	10,200	.4016	96	110	1,7	158	45	12
4143474	VDS403A10300	10,300	.4055	96	110	1,8	158	45	12
4143475	VDS403A10320	10,320	.4063	96	110	1,8	158	45	12
4143476	VDS403A10400	10,400	.4094	96	110	1,8	158	45	12
4143477	VDS403A10500	10,500	.4134	96	110	1,8	158	45	12
4143478	VDS403A10600	10,600	.4173	96	110	1,8	158	45	12
4143479	VDS403A10700	10,700	.4213	96	110	1,8	158	45	12
4143480	VDS403A10716	10,716	.4219	96	110	1,8	158	45	12
4143481	VDS403A10800	10,800	.4252	96	110	1,9	158	45	12
4143482	VDS403A10900	10,900	.4291	96	110	1,9	158	45	12
4143483	VDS403A11000	11,000	.4331	96	110	1,9	158	45	12
4143484	VDS403A11100	11,100	.4370	96	110	1,9	158	45	12
4143485	VDS403A11113	11,113	.4375	96	110	1,9	158	45	12
4143486	VDS403A11200	11,200	.4409	96	110	1,9	158	45	12
4143487	VDS403A11300	11,300	.4449	96	110	1,9	158	45	12
4143488	VDS403A11400	11,400	.4488	96	110	2,0	158	45	12
4143489	VDS403A11500	11,500	.4528	96	110	2,0	158	45	12

VariDrill • 8 x D • VDS403A • A-Shank

(continued)



For information on L, L3, and L4 max, see page C29.

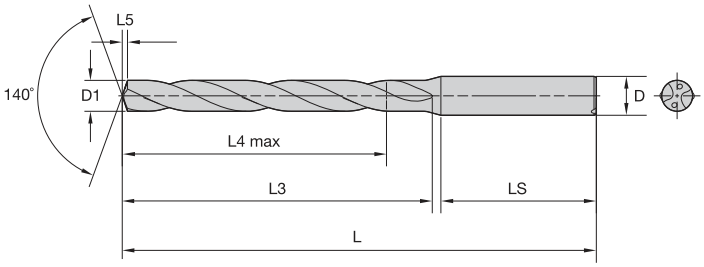


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143490	VDS403A11509	11,509	.4531	96	110	2,0	158	45	12
4143491	VDS403A11600	11,600	.4567	96	110	2,0	158	45	12
4143492	VDS403A11700	11,700	.4606	96	110	2,0	158	45	12
4143493	VDS403A11800	11,800	.4646	96	110	2,0	158	45	12
4143494	VDS403A11900	11,900	.4685	96	110	2,0	158	45	12
4143495	VDS403A11908	11,908	.4688	96	110	2,0	158	45	12
4143496	VDS403A12000	12,000	.4724	96	110	2,1	158	45	12
4143497	VDS403A12100	12,100	.4764	112	128	2,1	176	45	14
4143498	VDS403A12200	12,200	.4803	112	128	2,1	176	45	14
4143499	VDS403A12300	12,300	.4843	112	128	2,1	176	45	14
4143500	VDS403A12304	12,304	.4844	112	128	2,1	176	45	14
4143501	VDS403A12400	12,400	.4882	112	128	2,1	176	45	14
4143502	VDS403A12500	12,500	.4921	112	128	2,2	176	45	14
4143503	VDS403A12600	12,600	.4961	112	128	2,2	176	45	14
4143504	VDS403A12700	12,700	.5000	112	128	2,2	176	45	14
4143505	VDS403A12800	12,800	.5039	112	128	2,2	176	45	14
4143506	VDS403A12900	12,900	.5079	112	128	2,2	176	45	14
4143507	VDS403A13000	13,000	.5118	112	128	2,2	176	45	14
4143508	VDS403A13096	13,096	.5156	112	128	2,3	176	45	14
4143509	VDS403A13100	13,100	.5157	112	128	2,3	176	45	14
4143510	VDS403A13200	13,200	.5197	112	128	2,3	176	45	14
4143511	VDS403A13300	13,300	.5236	112	128	2,3	176	45	14
4143512	VDS403A13400	13,400	.5276	112	128	2,3	176	45	14
4143513	VDS403A13500	13,500	.5315	112	128	2,3	176	45	14
4143514	VDS403A13600	13,600	.5354	112	128	2,3	176	45	14
4143515	VDS403A13700	13,700	.5394	112	128	2,4	176	45	14
4143516	VDS403A13800	13,800	.5433	112	128	2,4	176	45	14
4143517	VDS403A13891	13,891	.5469	112	128	2,4	176	45	14
4143518	VDS403A13900	13,900	.5472	112	128	2,4	176	45	14
4143519	VDS403A14000	14,000	.5512	112	128	2,4	176	45	14
4143520	VDS403A14100	14,100	.5551	128	146	2,4	197	48	16
4143521	VDS403A14200	14,200	.5591	128	146	2,5	197	48	16
4143522	VDS403A14288	14,288	.5625	128	146	2,5	197	48	16
4143523	VDS403A14300	14,300	.5630	128	146	2,5	197	48	16
4143524	VDS403A14400	14,400	.5669	128	146	2,5	197	48	16
4143525	VDS403A14500	14,500	.5709	128	146	2,5	197	48	16
4143526	VDS403A14600	14,600	.5748	128	146	2,5	197	48	16
4143527	VDS403A14684	14,684	.5781	128	146	2,5	197	48	16
4143528	VDS403A14700	14,700	.5787	128	146	2,5	197	48	16
4143529	VDS403A14800	14,800	.5827	128	146	2,6	197	48	16
4143530	VDS403A14900	14,900	.5866	128	146	2,6	197	48	16
4143531	VDS403A15000	15,000	.5906	128	146	2,6	197	48	16
4143532	VDS403A15083	15,083	.5938	128	146	2,6	197	48	16
4143533	VDS403A15100	15,100	.5945	128	146	2,6	197	48	16
4143534	VDS403A15200	15,200	.5984	128	146	2,6	197	48	16
4143535	VDS403A15300	15,300	.6024	128	146	2,6	197	48	16
4143536	VDS403A15400	15,400	.6063	128	146	2,7	197	48	16
4143537	VDS403A15479	15,479	.6094	128	146	2,7	197	48	16
4143538	VDS403A15500	15,500	.6102	128	146	2,7	197	48	16
4143539	VDS403A15600	15,600	.6142	128	146	2,7	197	48	16
4143540	VDS403A15700	15,700	.6181	128	146	2,7	197	48	16
4143541	VDS403A15800	15,800	.6220	128	146	2,7	197	48	16

VariDrill • 8 x D • VDS403A • A-Shank

(continued)



For information on L, L3, and L4 max, see page C29.

● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143542	VDS403A15875	15,875	.6250	128	146	2,8	197	48	16
4143543	VDS403A15900	15,900	.6260	128	146	2,8	197	48	16
4143544	VDS403A16000	16,000	.6299	128	146	2,8	197	48	16
4143546	VDS403A16200	16,200	.6378	144	163	2,8	214	48	18
4143547	VDS403A16271	16,271	.6406	144	163	2,8	214	48	18
4143548	VDS403A16300	16,300	.6417	144	163	2,8	214	48	18
4143549	VDS403A16400	16,400	.6457	144	163	2,8	214	48	18
4143550	VDS403A16500	16,500	.6496	144	163	2,9	214	48	18
4143551	VDS403A16600	16,600	.6535	144	163	2,9	214	48	18
4143552	VDS403A16670	16,670	.6563	144	163	2,9	214	48	18
4143553	VDS403A16700	16,700	.6575	144	163	2,9	214	48	18
4143554	VDS403A16800	16,800	.6614	144	163	2,9	214	48	18
4143555	VDS403A16900	16,900	.6654	144	163	2,9	214	48	18
4143556	VDS403A17000	17,000	.6693	144	163	3,0	214	48	18
4143557	VDS403A17100	17,100	.6732	144	163	3,0	214	48	18
4143558	VDS403A17200	17,200	.6772	144	163	3,0	214	48	18
4143559	VDS403A17300	17,300	.6811	144	163	3,0	214	48	18
4143560	VDS403A17400	17,400	.6850	144	163	3,0	214	48	18
4143561	VDS403A17463	17,463	.6875	144	163	3,0	214	48	18
4143562	VDS403A17500	17,500	.6890	144	163	3,0	214	48	18
4143563	VDS403A17600	17,600	.6929	144	163	3,1	214	48	18
4143564	VDS403A17700	17,700	.6969	144	163	3,1	214	48	18
4143565	VDS403A17800	17,800	.7008	144	163	3,1	214	48	18
4144209	VDS403A18000	18,000	.7087	144	163	3,1	214	48	18
4144211	VDS403A18100	18,100	.7126	160	181	3,1	234	50	20
4144212	VDS403A18200	18,200	.7165	160	181	3,2	234	50	20
4144246	VDS403A18300	18,300	.7205	160	181	3,2	234	50	20
4144248	VDS403A18400	18,400	.7244	160	181	3,2	234	50	20
4144250	VDS403A18500	18,500	.7283	160	181	3,2	234	50	20
4144252	VDS403A18600	18,600	.7323	160	181	3,2	234	50	20
4144256	VDS403A18700	18,700	.7362	160	181	3,3	234	50	20
4144258	VDS403A18800	18,800	.7402	160	181	3,3	234	50	20
4144260	VDS403A18900	18,900	.7441	160	181	3,3	234	50	20
4144262	VDS403A19000	19,000	.7480	160	181	3,3	234	50	20
4144275	VDS403A19050	19,050	.7500	160	181	3,3	234	50	20
4144277	VDS403A19100	19,100	.7520	160	181	3,3	234	50	20
4144281	VDS403A19300	19,300	.7598	160	181	3,4	234	50	20
4144283	VDS403A19400	19,400	.7638	160	181	3,4	234	50	20
4144285	VDS403A19500	19,500	.7677	160	181	3,4	234	50	20
4144289	VDS403A19700	19,700	.7756	160	181	3,4	234	50	20
4144291	VDS403A19800	19,800	.7795	160	181	3,4	234	50	20
4144303	VDS403A19900	19,900	.7835	160	181	3,5	234	50	20
4144305	VDS403A20000	20,000	.7874	160	181	3,5	234	50	20

Application Data • VDS2 Series • WU25PD™ • Flood Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min	–	max	Tool Diameter (mm)	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
						Recommended Feed Rate (f) by Diameter									
P	0	70	–	115	mm/r	0,03–0,08	0,04–0,09	0,05–0,11	0,08–0,14	0,09–0,19	0,11–0,22	0,13–0,26	0,15–0,30	0,19–0,36	0,24–0,46
	1	60	–	100	mm/r	0,04–0,09	0,05–0,11	0,06–0,13	0,09–0,16	0,11–0,22	0,13–0,26	0,15–0,31	0,18–0,35	0,22–0,42	0,28–0,54
	2	80	–	100	mm/r	0,04–0,09	0,05–0,11	0,06–0,13	0,08–0,16	0,12–0,22	0,14–0,26	0,17–0,31	0,20–0,35	0,24–0,42	0,31–0,53
	3	50	–	90	mm/r	0,05–0,11	0,06–0,13	0,07–0,15	0,09–0,17	0,13–0,23	0,15–0,28	0,19–0,33	0,22–0,38	0,26–0,47	0,34–0,59
	4	50	–	100	mm/r	0,04–0,12	0,05–0,13	0,06–0,15	0,08–0,17	0,12–0,23	0,14–0,28	0,17–0,33	0,19–0,38	0,23–0,47	0,29–0,59
	5	30	–	60	mm/r	0,03–0,05	0,04–0,06	0,05–0,07	0,06–0,10	0,08–0,14	0,10–0,18	0,12–0,22	0,14–0,24	0,18–0,32	0,23–0,41
	6	30	–	60	mm/r	0,03–0,05	0,04–0,06	0,05–0,07	0,06–0,10	0,08–0,14	0,10–0,18	0,12–0,22	0,14–0,24	0,18–0,32	0,23–0,41
M	1	20	–	40	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	2	30	–	50	mm/r	0,02–0,06	0,03–0,07	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	3	20	–	40	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,06–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	1	80	–	170	mm/r	0,09–0,18	0,10–0,20	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	2	90	–	120	mm/r	0,06–0,13	0,08–0,15	0,10–0,17	0,12–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	3	80	–	130	mm/r	0,05–0,11	0,06–0,13	0,07–0,15	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,25–0,48	0,30–0,60
N	1	90	–	270	mm/r	0,05–0,12	0,06–0,13	0,08–0,14	0,10–0,16	0,12–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,48
	2	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,44	0,32–0,52
	3	90	–	225	mm/r	0,10–0,13	0,11–0,14	0,12–0,14	0,13–0,16	0,14–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,44
	4	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,40	0,32–0,48
S	1	20	–	30	mm/r	0,01–0,04	0,02–0,05	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	2	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	3	20	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	4	20	–	50	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
H	1	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	2	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15

Application Data • VDS4 Series • WU25PD • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min	–	max	Tool Diameter (mm)	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
						Recommended Feed Rate (f) by Diameter									
P	0	70	–	115	mm/r	0,03–0,08	0,04–0,09	0,05–0,11	0,08–0,14	0,09–0,19	0,11–0,22	0,13–0,26	0,15–0,30	0,19–0,36	0,24–0,46
	1	70	–	140	mm/r	0,04–0,09	0,05–0,12	0,07–0,14	0,08–0,16	0,11–0,22	0,13–0,26	0,15–0,31	0,18–0,35	0,22–0,42	0,28–0,54
	2	90	–	140	mm/r	0,04–0,09	0,05–0,12	0,07–0,14	0,08–0,16	0,12–0,22	0,14–0,26	0,17–0,31	0,20–0,35	0,24–0,42	0,31–0,53
	3	60	–	100	mm/r	0,05–0,10	0,06–0,13	0,08–0,15	0,09–0,17	0,13–0,23	0,15–0,28	0,19–0,33	0,22–0,38	0,26–0,47	0,34–0,59
	4	50	–	100	mm/r	0,05–0,10	0,06–0,13	0,07–0,15	0,08–0,17	0,12–0,23	0,14–0,28	0,17–0,33	0,19–0,38	0,23–0,47	0,29–0,59
	5	30	–	60	mm/r	0,03–0,05	0,04–0,06	0,05–0,07	0,06–0,10	0,08–0,14	0,10–0,18	0,12–0,22	0,14–0,24	0,18–0,32	0,23–0,41
	6	40	–	70	mm/r	0,03–0,05	0,04–0,06	0,05–0,08	0,06–0,10	0,08–0,14	0,10–0,18	0,13–0,22	0,14–0,24	0,18–0,32	0,23–0,41
M	1	20	–	40	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	2	30	–	50	mm/r	0,02–0,06	0,03–0,07	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	3	20	–	40	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	1	80	–	170	mm/r	0,08–0,16	0,09–0,17	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	2	80	–	140	mm/r	0,10–0,14	0,11–0,15	0,12–0,16	0,13–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	3	80	–	130	mm/r	0,05–0,13	0,07–0,15	0,08–0,17	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60
N	1	90	–	315	mm/r	0,05–0,12	0,06–0,13	0,08–0,14	0,10–0,16	0,12–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,48
	2	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,44	0,32–0,52
	3	90	–	270	mm/r	0,10–0,13	0,11–0,14	0,12–0,14	0,13–0,16	0,14–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,44
	4	90	–	180	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,40	0,32–0,48
S	1	10	–	30	mm/r	0,01–0,04	0,02–0,05	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	2	10	–	25	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	3	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	4	10	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
H	1	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	2	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15

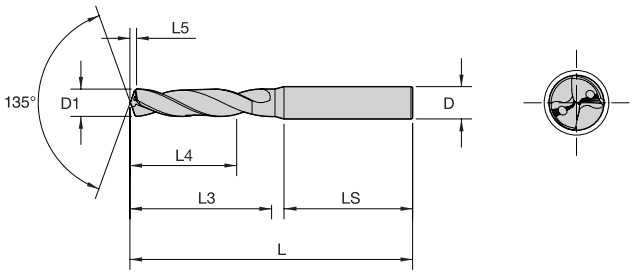
	Metric tolerance	
nominal size range	D1 tolerance	D tolerance h6
1–3	0,000/-0,014 (h8)	0,000/-0,006
>3–6	0,000/-0,012 (h7)	0,000/-0,008
>6–10	0,000/-0,015 (h7)	0,000/-0,009
>10–18	0,000/-0,018 (h7)	0,000/-0,011
>18–20	0,000/-0,021 (h7)	0,000/-0,013

General Application Instructions

Shank Designs to DIN 6535

Form HE,
2° angle
Design F

Form HA,
straight
design A



Dimensions for WIDIA™ High-Performance Solid Carbide Drills

mm Ø		DIN 6535		SHORT* ~3 x D			LONG* ~5 x D			EXTRA LONG** ~8 x D		
D1 min	D1 max	D	LS	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
1,000	1,400	4	28	58	7	5	58	9	6	58	12	10
1,401	1,900	4	28	58	9	6	58	12	9	58	18	15
1,901	2,300	4	28	58	13	9	58	18	14	66	26	22
2,301	2,999	4	28	58	17	12	58	22	17	66	30	25
3,000	3,750	6	36	62	20	14	66	28	23	78	40	33
3,751	4,750	6	36	66	24	17	74	36	29	87	49	41
4,751	6,000	6	36	66	28	20	82	44	35	94	56	48
6,001	7,000	8	36	79	34	24	91	53	43	105	67	57
7,001	8,000	8	36	79	41	29	91	53	43	110	72	61
8,001	10,000	10	40	89	47	35	103	61	49	122	80	68
10,001	12,000	12	45	102	55	40	118	71	56	141	94	79
12,001	14,000	14	45	107	60	43	124	77	60	155	108	91
14,001	16,000	16	48	115	65	45	133	83	63	171	121	101
16,001	18,000	18	48	123	73	51	143	93	71	185	135	113
18,001	20,000	20	50	131	79	55	153	101	77	200	148	124
20,001	22,000	20	50	141	86	60	167	112	85	217	162	136
22,001	25,000	25	56	153	95	65	184	126	98	238	180	150

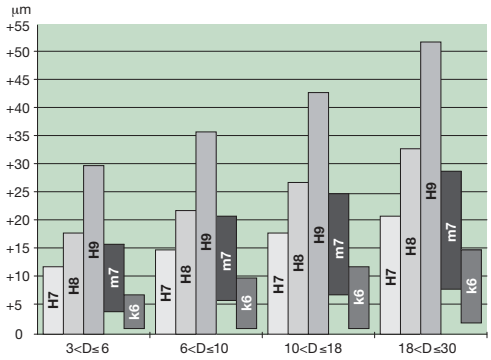
** D1<20mm to DIN 6537K*
D1>20mm to factory standard
*** To factory standard*

NOTE: Solid Carbide Drills from WIDIA in short and regular lengths conform to DIN 6537.
Drills with long lengths conform to WIDIA factory standard.
Solid Carbide Drills with diameter D1>20mm (not DIN 6537) are also standardised to factory standard.

Tolerances of Drills and Holes

High-performance solid carbide drills with tolerances of m7 create holes with tolerances of H9. H8 can be achieved in very good conditions. The drill should be used for holes in H8, and in favourable conditions, H7 can be achieved. Solid carbide drills with H7 create holes in K9–K11. Other drilling tolerances require special solid carbide drill versions.

Tolerances of diameter D1 on:
Spiral Flute
TDG Drill



TOP DRILL S+™

Solid Carbide Drills 12 x D • TDS+

TDS+ solid carbide drills are for shop floors seeking a drill with optimal performance and hole quality in steel, stainless steel, and cast iron materials using one universal geometry and grade.

135° point geometry
Low thrust with excellent centering capabilities

4-margin design to full length
Provides stability in interrupted cut with optimal hole quality

30º helix with optimized flute profile
Reduces risk of chip jamming and catastrophic failure

Sub-micron grain substrate
Superior resistance against drill breakage

TDS+ 12 x D drills are capable of drilling holes in steel and cast iron without a pilot drill due to its 135° P point geometry and four full-length margins

WU20PD

P M K

Sub-micron grain carbide
TiAlN multilayer for steel, stainless steel, and cast iron

OPTIMAL PERFORMANCE

PRODUCT

TDS P Point with 135° P point angle for excellent centering and low thrust

DIAMETER RANGE

3–20mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

FIRST CHOICE

P K

SECOND CHOICE

M

APPLICATIONS

DRILLING | INCLINED EXIT | STACKED PLATES | DRILLING DEPTH: 12X | 2 FLUTE/4 MARGIN/ COOLANT | THROUGH COOLANT | MQL (MINIMUM QUANTITY LUBRICANT) | HELIX ANGLE: 30º | PLAIN SHANK: ≤H6 | DIN 6535

SERIES	COOLANT	LENGTH RATIO	DIAMETER RANGE
TDS504	Through Coolant	12 x D	3–20mm

Shank Style

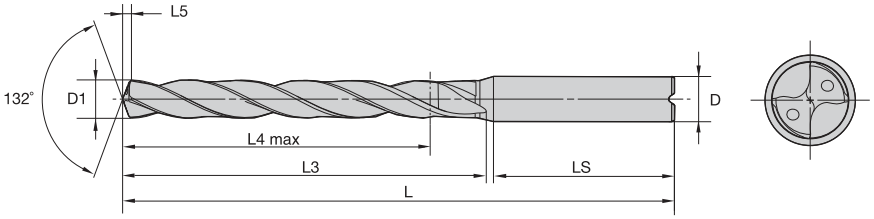
A - Shank DIN 6535 HA
(round cylindrical, 2mm steps)

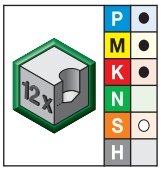
TDS+ • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

TDS	5	0	4	A	06350	WU20PD
Top Drill Spiral	Flute Style - Coolant	Point	Length	Shank	Diameter in Metric	
	5 = 2 Flute Through Coolant	**0** = Conventional Cone Point **1** = Conventional Cone Point with Chamfer	**1** = ~ 3 x D **2** = ~ 5 x D **3** = ~ 8 x D **4** = ~ 12 x D	**A** = Cylindrical Shank, DIN 6535 - 2mm steps **F** = Whistle Notch 2, DIN 6535 - 2mm steps	**03000** = 3,000mm **06350** = 1/4" = E	**W**IDIA™; **Un**iversal, Application **20** = medium carbide, **P**VD coated, **D**rill

TOP DRILL S+ • 12 x D • TDS504A • A-Shank





For information on L, L3, and L4 max, see page C29.

● first choice
○ alternate choice

grade WU20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L	L4 max	L3	L5	LS	D
4173459	TDS504A03000	3,000	.1181	93	44	52,0	0,6	36	6
4173460	TDS504A03175	3,175	.1250	93	44	52,0	0,7	36	6
4173461	TDS504A03264	3,264	.1285	93	44	53,0	0,7	36	6
4173545	TDS504A03455	3,455	.1360	93	44	53,0	0,7	36	6
4173462	TDS504A03500	3,500	.1378	93	44	53,0	0,7	36	6
4173546	TDS504A03734	3,734	.1470	93	45	54,0	0,8	36	6
4173463	TDS504A03970	3,970	.1563	107	56	66,0	0,8	36	6
4173464	TDS504A04000	4,000	.1575	107	56	66,0	0,8	36	6
4173465	TDS504A04500	4,500	.1772	107	56	67,0	0,9	36	6
4173466	TDS504A04600	4,600	.1811	107	57	68,0	1,0	36	6
4173467	TDS504A04763	4,763	.1875	125	69	82,0	1,0	36	6
4173468	TDS504A04800	4,800	.1890	125	69	82,0	1,0	36	6
4173469	TDS504A05000	5,000	.1969	125	70	83,0	1,1	36	6
4173470	TDS504A05100	5,100	.2008	125	70	83,0	1,1	36	6
4173471	TDS504A05200	5,200	.2047	125	70	83,0	1,1	36	6
4173472	TDS504A05300	5,300	.2087	125	71	84,0	1,1	36	6
4173473	TDS504A05410	5,410	.2130	125	71	84,0	1,1	36	6
4173474	TDS504A05500	5,500	.2165	125	71	84,0	1,2	36	6
4173475	TDS504A05558	5,558	.2188	125	71	84,0	1,2	36	6
4173476	TDS504A05600	5,600	.2205	125	72	85,0	1,2	36	6
4173477	TDS504A05700	5,700	.2244	125	72	85,0	1,2	36	6
4173478	TDS504A05800	5,800	.2283	125	71	85,0	1,2	36	6
4173479	TDS504A06000	6,000	.2362	125	72	86,0	1,3	36	6
4173480	TDS504A06200	6,200	.2441	139	82	97,0	1,3	36	8
4173481	TDS504A06350	6,350	.2500	139	83	98,0	1,3	36	8
4173482	TDS504A06500	6,500	.2559	139	83	98,0	1,4	36	8
4173484	TDS504A06600	6,600	.2598	139	84	99,0	1,4	36	8
4173485	TDS504A06746	6,746	.2656	139	83	99,0	1,4	36	8
4173486	TDS504A06800	6,800	.2677	139	83	99,0	1,4	36	8
4173487	TDS504A06909	6,909	.2720	139	84	100,0	1,5	36	8
4173488	TDS504A07000	7,000	.2756	139	84	100,0	1,5	36	8
4173489	TDS504A07145	7,145	.2813	153	94	111,0	1,5	36	8
4173490	TDS504A07500	7,500	.2953	153	95	112,0	1,6	36	8
4173491	TDS504A07541	7,541	.2969	153	95	112,0	1,6	36	8
4173492	TDS504A07700	7,700	.3031	153	96	113,0	1,6	36	8
4173493	TDS504A07800	7,800	.3071	153	95	113,0	1,7	36	8
4173494	TDS504A07938	7,938	.3125	153	96	114,0	1,7	36	8
4173495	TDS504A08000	8,000	.3150	153	96	114,0	1,7	36	8
4173496	TDS504A08100	8,100	.3189	185	116	136,0	1,7	40	10
4173497	TDS504A08334	8,334	.3281	185	117	137,0	1,8	40	10
4173498	TDS504A08433	8,433	.3320	185	117	137,0	1,8	40	10
4173499	TDS504A08500	8,500	.3346	185	117	137,0	1,8	40	10
4173500	TDS504A08700	8,700	.3425	185	118	138,0	1,9	40	10
4173501	TDS504A08733	8,733	.3438	185	117	138,0	1,9	40	10
4173502	TDS504A09000	9,000	.3543	185	118	139,0	1,9	40	10
4173503	TDS504A09100	9,100	.3583	185	118	139,0	1,9	40	10
4173504	TDS504A09129	9,129	.3594	185	118	139,0	1,9	40	10
4173547	TDS504A09347	9,347	.3680	185	119	140,0	2,0	40	10
4173505	TDS504A09500	9,500	.3740	185	119	140,0	2,0	40	10
4173506	TDS504A09525	9,525	.3750	185	119	140,0	2,0	40	10
4173507	TDS504A09921	9,921	.3906	185	120	142,0	2,1	40	10
4173508	TDS504A10000	10,000	.3937	185	120	142,0	2,1	40	10
4173509	TDS504A10200	10,200	.4016	218	140	164,0	2,2	45	12
4173510	TDS504A10300	10,300	.4055	218	141	165,0	2,2	45	12
4173511	TDS504A10320	10,320	.4063	218	141	165,0	2,2	45	12
4173512	TDS504A10500	10,500	.4134	218	141	165,0	2,2	45	12

TOP DRILL S+ • 12 x D • TDS504A • A-Shank

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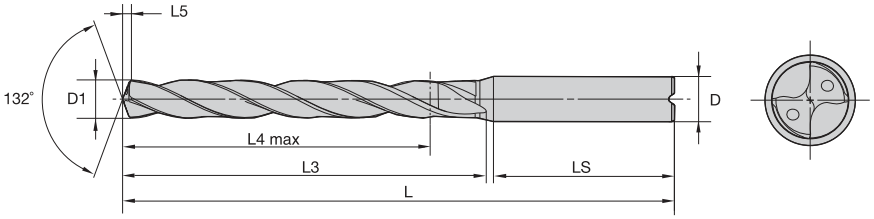
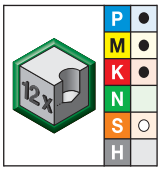




For information on L, L3, and L4 max, see page C29.

● first choice
○ alternate choice

grade WU20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L	L4 max	L3	L5	LS	D
4173513	TDS504A10716	10,716	.4219	218	142	166,0	2,3	45	12
4173514	TDS504A10800	10,800	.4252	218	141	166,0	2,3	45	12
4173515	TDS504A11000	11,000	.4331	218	142	167,0	2,4	45	12
4173516	TDS504A11113	11,113	.4375	218	142	167,0	2,4	45	12
4173517	TDS504A11500	11,500	.4528	218	143	168,0	2,5	45	12
4173518	TDS504A11800	11,800	.4646	218	143	169,0	2,5	45	12
4173519	TDS504A12000	12,000	.4724	218	144	170,0	2,6	45	12
4173520	TDS504A12100	12,100	.4764	246	164	192,0	2,6	45	14
4148906	TDS504A12500	12,500	.4921	246	165	193,0	2,7	45	14
4173522	TDS504A12700	12,700	.5000	246	166	194,0	2,7	45	14
4173523	TDS504A13000	13,000	.5118	246	166	195,0	2,8	45	14
4173524	TDS504A13100	13,100	.5157	246	166	195,0	2,8	45	14
4173525	TDS504A13500	13,500	.5315	246	167	196,0	2,9	45	14
4173526	TDS504A14000	14,000	.5512	246	168	198,0	3,0	45	14
4173527	TDS504A14100	14,100	.5551	277	188	220,0	3,0	48	16
4173528	TDS504A14288	14,288	.5625	277	188	220,0	3,1	48	16
4173529	TDS504A14500	14,500	.5709	277	189	221,0	3,1	48	16
4173530	TDS504A14684	14,684	.5781	277	190	222,0	3,2	48	16
4173531	TDS504A15000	15,000	.5906	277	190	223,0	3,2	48	16
4173533	TDS504A15875	15,875	.6250	277	192	225,0	3,4	48	16
4173534	TDS504A16000	16,000	.6299	277	192	226,0	3,4	48	16
4173535	TDS504A16500	16,500	.6496	305	213	249,0	3,6	48	18
4173536	TDS504A17000	17,000	.6693	305	214	250,0	3,7	48	18
4173537	TDS504A17463	17,463	.6875	305	215	252,0	3,8	48	18
4173538	TDS504A17500	17,500	.6890	305	215	252,0	3,8	48	18
4173539	TDS504A18000	18,000	.7087	305	216	253,0	3,9	48	18
4173541	TDS504A19000	19,000	.7480	334	238	278,0	4,1	50	20
4173543	TDS504A19500	19,500	.7677	334	239	280,0	4,2	50	20
4173544	TDS504A20000	20,000	.7874	334	240	281,0	4,3	50	20

Application Data • TDS+ Series • WU20PD™ • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
					Recommended Feed Rate (f) by Diameter								
P	0	80	–	160	mm/r	0,06—0,12	0,07—0,14	0,09—0,19	0,11—0,22	0,13—0,26	0,15—0,30	0,19—0,36	0,24—0,46
	1	70	–	140	mm/r	0,07—0,14	0,08—0,16	0,11—0,22	0,13—0,26	0,15—0,31	0,18—0,35	0,22—0,42	0,28—0,54
	2	90	–	140	mm/r	0,07—0,14	0,08—0,16	0,12—0,22	0,14—0,26	0,17—0,31	0,20—0,35	0,24—0,42	0,31—0,53
	3	60	–	100	mm/r	0,08—0,15	0,09—0,17	0,13—0,23	0,15—0,28	0,19—0,33	0,22—0,38	0,26—0,47	0,34—0,59
	4	50	–	100	mm/r	0,07—0,15	0,08—0,17	0,12—0,23	0,14—0,28	0,17—0,33	0,19—0,38	0,23—0,47	0,29—0,59
	5	50	–	80	mm/r	0,08—0,13	0,10—0,15	0,12—0,19	0,16—0,24	0,20—0,27	0,24—0,30	0,28—0,38	0,32—0,44
	6	40	–	70	mm/r	0,05—0,08	0,06—0,10	0,08—0,14	0,10—0,18	0,13—0,22	0,14—0,24	0,18—0,32	0,23—0,41
M	1	30	–	50	mm/r	0,04—0,07	0,05—0,09	0,08—0,11	0,09—0,12	0,10—0,14	0,12—0,16	0,14—0,18	0,16—0,20
	2	40	–	60	mm/r	0,04—0,08	0,06—0,10	0,08—0,12	0,09—0,14	0,10—0,16	0,12—0,18	0,14—0,20	0,16—0,22
	3	30	–	50	mm/r	0,04—0,07	0,05—0,09	0,08—0,11	0,09—0,12	0,10—0,14	0,12—0,16	0,14—0,18	0,16—0,20
K	1	80	–	170	mm/r	0,11—0,22	0,12—0,24	0,16—0,31	0,20—0,38	0,23—0,44	0,25—0,49	0,31—0,60	0,38—0,74
	2	80	–	140	mm/r	0,12—0,16	0,13—0,19	0,16—0,25	0,20—0,31	0,23—0,36	0,25—0,40	0,31—0,48	0,38—0,60
	3	80	–	130	mm/r	0,08—0,17	0,09—0,19	0,12—0,25	0,14—0,30	0,17—0,35	0,19—0,40	0,24—0,48	0,30—0,60
N	1	90	–	315	mm/r	0,08—0,14	0,10—0,16	0,12—0,20	0,16—0,24	0,20—0,28	0,24—0,32	0,28—0,40	0,32—0,48
	2	90	–	270	mm/r	0,08—0,16	0,10—0,20	0,12—0,24	0,16—0,28	0,20—0,32	0,24—0,36	0,28—0,44	0,32—0,52
	3	90	–	270	mm/r	0,12—0,14	0,13—0,16	0,14—0,20	0,16—0,24	0,20—0,28	0,24—0,32	0,28—0,40	0,32—0,44
	4	90	–	180	mm/r	0,08—0,16	0,01—0,20	0,12—0,24	0,16—0,28	0,20—0,32	0,24—0,36	0,28—0,40	0,32—0,48
S	1	10	–	30	mm/r	0,03—0,06	0,04—0,08	0,06—0,10	0,08—0,12	0,09—0,13	0,10—0,14	0,12—0,16	0,14—0,18
	2	10	–	25	mm/r	0,02—0,04	0,03—0,06	0,05—0,08	0,07—0,10	0,08—0,11	0,09—0,12	0,10—0,14	0,11—0,16
	3	10	–	30	mm/r	0,02—0,04	0,02—0,05	0,04—0,07	0,06—0,09	0,07—0,10	0,08—0,11	0,09—0,13	0,10—0,15
	4	10	–	40	mm/r	0,02—0,04	0,03—0,06	0,05—0,08	0,07—0,10	0,08—0,11	0,09—0,12	0,10—0,14	0,11—0,16

	Metric tolerance	
nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

TOP DRILL™ Deep Hole

Solid Carbide Deep Hole Drills • TDD

TDD solid carbide deep hole drills consistently deliver high MRRs in steel and cast iron materials using one universal grade.

132° cone point geometry
Improves hole quality, and productivity.

4-margin design
Improves process stability, increases tool life, enables interrupted cuts.

30° helix with optimized flute profile
Reduces risk of chip jamming and catastrophic failure.

Ultra-fine grain substrate
Superior resistance against drill breakage.

The Solid Carbide Deep Hole Drills are enhanced with a cone point geometry which enables the drill to outperform gun drills and HSS deep hole drills in deep hole applications up to 30 x D.

WU20PD

P M K

Ultra-fine grain carbide
TiAlN multilayer for steel and cast iron

CONSISTENT PERFORMANCE

PRODUCT

POINT GEOMETRY/GRADE

UP 132° cone point geometry, low thrust, excellent centering

DIAMETER RANGE

3,0–13,0mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

FIRST CHOICE

P K

SECOND CHOICE

M N S

APPLICATIONS

DRILLING

INCLINED EXIT

STACKED PLATES

2 FLUTE/4 MARGIN/ COOLANT

THROUGH COOLANT

MQL (MINIMUM QUANTITY LUBRICANT)

HELIX ANGLE: 30º

PLAIN SHANK: ≤H5

SERIES	LENGTH RATIO	DIAMETER RANGE
TDD105Z (H101Z)	15 x D	3,0–13,0mm
TDD106Z (H102Z)	20 x D	3,0–13,0mm
TDD107Z (H103Z)	25 x D	3,0–13,0mm
TDD108Z (H104Z)	30 x D	3,0–13,0mm

Z–SHANK

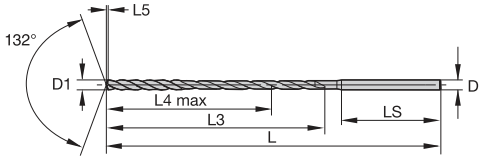
Round cylindrical, 1mm steps

TDD • Catalog Numbering System

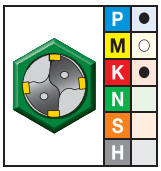
Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

TD	D	105	Z	03000	WU20PD
Top Drill	Deep Hole Drills	Length	Shank	Diameter in Metric	
TD = Top Drill		**5** = 15 x D (H101) **6** = 20 x D (H102) **7** = 25 x D (H103) **8** = 30 x D (H104)	**Z** = Cylindrical Shank, 1mm steps	**03000** = 3,000mm **06350** = 1/4"	**W**IDIA™, **U**niversal, **P**VD, **D**rilling

TOP DRILL Deep Hole • 15 x D • TDD105 • 2 Flute



For information on L, L3, and L4 max, see page C29.

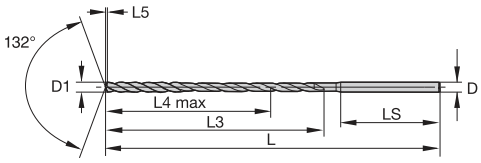


● first choice
○ alternate choice

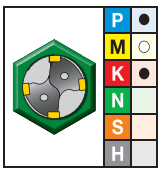
grade WU20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
3899626	TDD105Z03000	3,000	.1181	3	52	45	0,6	30	86
3899627	TDD105Z03175	3,175	.1250	4	67	58	0,6	32	105
3899628	TDD105Z03500	3,500	.1378	4	68	59	0,7	32	105
3899629	TDD105Z03571	3,571	.1406	4	68	59	0,7	32	105
3899630	TDD105Z03800	3,800	.1496	4	69	60	0,8	32	105
3899631	TDD105Z03970	3,970	.1563	4	70	60	0,8	32	105
3899632	TDD105Z04000	4,000	.1575	4	70	60	0,8	32	105
3899683	TDD105Z04039	4,039	.1590	5	84	73	0,8	34	124
3899684	TDD105Z04300	4,300	.1693	5	85	74	0,9	34	124
3899685	TDD105Z04500	4,500	.1772	5	85	74	0,9	34	124
3899686	TDD105Z04623	4,623	.1820	5	86	75	1,0	34	124
3899687	TDD105Z04763	4,763	.1875	5	86	75	1,0	34	124
3899688	TDD105Z05000	5,000	.1969	5	87	75	1,0	34	124
3899689	TDD105Z05159	5,159	.2031	6	101	88	1,1	36	143
3899690	TDD105Z05410	5,410	.2130	6	102	89	1,1	36	143
3899691	TDD105Z05500	5,500	.2165	6	102	89	1,1	36	143
3899692	TDD105Z05558	5,558	.2188	6	102	89	1,2	36	143
3899693	TDD105Z05800	5,800	.2283	6	103	89	1,2	36	143
3899694	TDD105Z06000	6,000	.2362	6	104	90	1,2	36	143
3899695	TDD105Z06200	6,200	.2441	7	118	103	1,3	38	162
3899696	TDD105Z06350	6,350	.2500	7	119	104	1,3	38	162
3899697	TDD105Z06500	6,500	.2559	7	119	104	1,4	38	162
3899698	TDD105Z06528	6,528	.2570	7	119	104	1,4	38	162
3899699	TDD105Z06746	6,746	.2656	7	120	104	1,4	38	162
3899700	TDD105Z06800	6,800	.2677	7	120	104	1,4	38	162
3899701	TDD105Z06909	6,909	.2720	7	121	105	1,4	38	162
3899702	TDD105Z07000	7,000	.2756	7	121	105	1,5	38	162
3900612	TDD105Z07145	7,145	.2813	8	135	118	1,5	40	181
3900633	TDD105Z07500	7,500	.2953	8	136	119	1,6	40	181
3899764	TDD106Z07500	7,500	.2953	8	174	157	1,6	40	221
3900635	TDD105Z07938	7,938	.3125	8	138	120	1,7	40	181
3900636	TDD105Z08000	8,000	.3150	8	138	120	1,7	40	181
3900637	TDD105Z08334	8,334	.3281	9	153	134	1,8	42	200
3900638	TDD105Z08433	8,433	.3320	9	153	134	1,8	42	200
3900639	TDD105Z08500	8,500	.3346	9	153	134	1,8	42	200
3900640	TDD105Z08733	8,733	.3438	9	154	134	1,8	42	200
3900641	TDD105Z09000	9,000	.3543	9	155	135	1,9	42	200
3900643	TDD105Z09500	9,500	.3740	10	170	149	2,0	44	219
3900644	TDD105Z09525	9,525	.3750	10	170	149	2,0	44	219
3900645	TDD105Z09750	9,750	.3839	10	171	149	2,1	44	219
3900647	TDD105Z10000	10,000	.3937	10	172	150	2,1	44	219
3900648	TDD105Z10200	10,200	.4016	11	186	163	2,2	46	238
3900649	TDD105Z10320	10,317	.4062	11	187	164	2,2	46	238
3900650	TDD105Z10500	10,500	.4134	11	187	164	2,2	46	238
3900652	TDD105Z11000	11,000	.4331	11	189	165	2,3	46	238
3900653	TDD105Z11113	11,113	.4375	12	203	178	2,4	48	257
3900654	TDD105Z11500	11,500	.4528	12	204	179	2,4	48	257
3900656	TDD105Z12000	12,000	.4724	12	206	180	2,5	48	257
3900657	TDD105Z12304	12,304	.4844	13	221	194	2,6	50	276
3900658	TDD105Z12500	12,500	.4921	13	221	194	2,7	50	276
3900659	TDD105Z12700	12,700	.5000	13	222	195	2,7	50	276
3900660	TDD105Z13000	13,000	.5118	13	223	195	2,8	50	276

NOTE: Use TDS 40xx series as pilot drills, see page C44.

TOP DRILL Deep Hole • 20 x D • TDD106 • 2 Flute



For information on L, L3, and L4 max, see page C29.

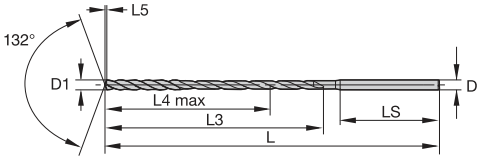


● first choice
○ alternate choice

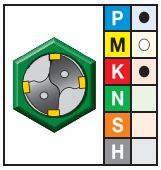
grade WU20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
3899782	TDD106Z03000	3,000	.1181	3	67	60	0,6	30	101
3899803	TDD106Z03175	3,175	.1250	4	83	74	0,6	32	125
3899804	TDD106Z03500	3,500	.1378	4	86	77	0,7	32	125
3899805	TDD106Z03571	3,571	.1406	4	86	77	0,7	32	125
3899806	TDD106Z03800	3,800	.1496	4	88	79	0,8	32	125
3899807	TDD106Z03970	3,970	.1563	4	89	79	0,8	32	125
3899808	TDD106Z04000	4,000	.1575	4	90	80	0,8	32	125
3899809	TDD106Z04039	4,039	.1590	5	104	93	0,8	34	149
3899810	TDD106Z04300	4,300	.1693	5	106	95	0,9	34	149
3899811	TDD106Z04500	4,500	.1772	5	108	97	0,9	34	149
3899812	TDD106Z04623	4,623	.1820	5	109	98	1,0	34	149
3899813	TDD106Z04763	4,763	.1875	5	110	99	1,0	34	149
3899814	TDD106Z05000	5,000	.1969	5	112	100	1,0	34	149
3899815	TDD106Z05159	5,159	.2031	6	127	114	1,1	36	173
3899816	TDD106Z05410	5,410	.2130	6	129	116	1,1	36	173
3899818	TDD106Z05500	5,500	.2165	6	130	117	1,1	36	173
3899819	TDD106Z05558	5,558	.2188	6	130	117	1,2	36	173
3899820	TDD106Z05800	5,800	.2283	6	132	118	1,2	36	173
3899821	TDD106Z06000	6,000	.2362	6	134	120	1,2	36	173
3899822	TDD106Z06200	6,200	.2441	7	149	134	1,3	38	197
3899823	TDD106Z06350	6,350	.2500	7	151	136	1,3	38	197
3899824	TDD106Z06500	6,500	.2559	7	152	137	1,4	38	197
3899825	TDD106Z06528	6,528	.2570	7	152	137	1,4	38	197
3899826	TDD106Z06746	6,746	.2656	7	154	138	1,4	38	197
3899827	TDD106Z06800	6,800	.2677	7	154	138	1,4	38	197
3899829	TDD106Z07000	7,000	.2756	7	156	140	1,5	38	197
3899763	TDD106Z07145	7,145	.2813	8	171	154	1,5	40	221
3899765	TDD106Z07541	7,541	.2969	8	174	157	1,6	40	221
3899766	TDD106Z07938	7,938	.3125	8	177	159	1,7	40	221
3899767	TDD106Z08000	8,000	.3150	8	178	160	1,7	40	221
3899769	TDD106Z08433	8,433	.3320	9	195	176	1,8	42	245
3899770	TDD106Z08500	8,500	.3346	9	196	177	1,8	42	245
3899771	TDD106Z08733	8,733	.3438	9	198	178	1,8	42	245
3899772	TDD106Z09000	9,000	.3543	9	200	180	1,9	42	245
3899784	TDD106Z09500	9,500	.3740	10	218	197	2,0	44	269
3899785	TDD106Z09525	9,525	.3750	10	218	197	2,0	44	269
3899787	TDD106Z09921	9,921	.3906	10	221	199	2,1	44	269
3899788	TDD106Z10000	10,000	.3937	10	222	200	2,1	44	269
3899789	TDD106Z10200	10,200	.4016	11	237	214	2,2	46	293
3899790	TDD106Z10320	10,317	.4062	11	238	215	2,2	46	293
3899791	TDD106Z10500	10,500	.4134	11	240	217	2,2	46	293
3899792	TDD106Z10716	10,716	.4219	11	242	219	2,3	46	293
3899793	TDD106Z11000	11,000	.4331	11	244	220	2,3	46	293
3899794	TDD106Z11113	11,113	.4375	12	259	234	2,4	48	317
3899795	TDD106Z11500	11,500	.4528	12	262	237	2,4	48	317
3899797	TDD106Z12000	12,000	.4724	12	266	240	2,5	48	317
3899799	TDD106Z12500	12,500	.4921	13	284	257	2,7	50	341
3899800	TDD106Z12700	12,700	.5000	13	285	258	2,7	50	341
3899801	TDD106Z13000	13,000	.5118	13	288	260	2,8	50	341

NOTE: Use TDS 40xx series as pilot drills, see page C44.

TOP DRILL Deep Hole • 25 x D • TDD107 • 2 Flute



For information on L, L3, and L4 max, see page C29.

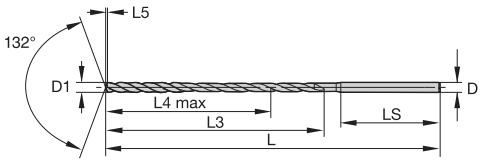


● first choice
○ alternate choice

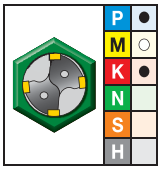
grade WU20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
3899708	TDD107Z03000	3,000	.1181	3	82	75	0,6	30	116
3899709	TDD107Z03175	3,175	.1250	4	99	90	0,6	32	145
3899710	TDD107Z03500	3,500	.1378	4	103	94	0,7	32	145
3899712	TDD107Z03800	3,800	.1496	4	107	98	0,8	32	145
3899733	TDD107Z03970	3,970	.1563	4	109	99	0,8	32	145
3899734	TDD107Z04000	4,000	.1575	4	110	100	0,8	32	145
3899737	TDD107Z04500	4,500	.1772	5	130	119	0,9	34	174
3899739	TDD107Z04763	4,763	.1875	5	134	123	1,0	34	174
3899740	TDD107Z05000	5,000	.1969	5	137	125	1,0	34	174
3899743	TDD107Z05500	5,500	.2165	6	157	144	1,1	36	203
3899744	TDD107Z05558	5,558	.2188	6	158	145	1,2	36	203
3899745	TDD107Z05800	5,800	.2283	6	161	147	1,2	36	203
3899746	TDD107Z06000	6,000	.2362	6	164	150	1,2	36	203
3899748	TDD107Z06350	6,350	.2500	7	182	167	1,3	38	232
3899749	TDD107Z06500	6,500	.2559	7	184	169	1,4	38	232
3899750	TDD107Z06528	6,528	.2570	7	185	170	1,4	38	232
3899753	TDD107Z06909	6,909	.2720	7	190	174	1,4	38	232
3899754	TDD107Z07000	7,000	.2756	7	191	175	1,5	38	232
3899567	TDD107Z07541	7,541	.2969	8	212	195	1,6	40	261
3899569	TDD107Z08000	8,000	.3150	8	218	200	1,7	40	261
3899571	TDD107Z08433	8,433	.3320	9	237	218	1,8	42	290
3899572	TDD107Z08500	8,500	.3346	9	238	219	1,8	42	290
3899604	TDD107Z09000	9,000	.3543	9	245	225	1,9	42	290
3899606	TDD107Z09500	9,500	.3740	10	265	244	2,0	44	319
3899607	TDD107Z09525	9,525	.3750	10	266	245	2,0	44	319
3899610	TDD107Z10000	10,000	.3937	10	272	250	2,1	44	319
3899611	TDD107Z10300	10,300	.4055	11	290	267	2,2	46	348
3899612	TDD107Z10320	10,320	.4063	11	290	267	2,2	46	348
3899613	TDD107Z10500	10,500	.4134	11	292	269	2,2	46	348
3899614	TDD107Z10716	10,716	.4219	11	295	272	2,3	46	348
3899615	TDD107Z11000	11,000	.4331	11	299	275	2,3	46	348
3899616	TDD107Z11113	11,113	.4375	12	314	289	2,4	48	377
3899617	TDD107Z11500	11,500	.4528	12	319	294	2,4	48	377
3899619	TDD107Z12000	12,000	.4724	12	326	300	2,5	48	377
3899621	TDD107Z12500	12,500	.4921	13	346	319	2,7	50	406
3899622	TDD107Z12700	12,700	.5000	13	349	322	2,7	50	406
3899623	TDD107Z13000	13,000	.5118	13	353	325	2,8	50	406

NOTE: Use TDS 40xx series as pilot drills, see page C44.

TOP DRILL Deep Hole • 30 x D • TDD108 • 2 Flute



For information on L, L3, and L4 max, see page C29.



● first choice
○ alternate choice

grade WU20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
3899539	TDD108Z03000	3,000	.1181	3	97	90	0,6	30	131
3899540	TDD108Z03175	3,175	.1250	4	115	106	0,6	32	165
3899541	TDD108Z03500	3,500	.1378	4	121	112	0,7	32	165
3899573	TDD108Z03800	3,800	.1496	4	126	117	0,8	32	165
3899574	TDD108Z03970	3,970	.1563	4	129	119	0,8	32	165
3899575	TDD108Z04000	4,000	.1575	4	130	120	0,8	32	165
3899576	TDD108Z04039	4,039	.1590	5	144	133	0,8	34	199
3899577	TDD108Z04300	4,300	.1693	5	149	138	0,9	34	199
3899578	TDD108Z04500	4,500	.1772	5	153	142	0,9	34	199
3899579	TDD108Z04623	4,623	.1820	5	155	144	1,0	34	199
3899580	TDD108Z04763	4,763	.1875	5	157	146	1,0	34	199
3899581	TDD108Z05000	5,000	.1969	5	162	150	1,0	34	199
3899582	TDD108Z05159	5,159	.2031	6	179	166	1,1	36	233
3899583	TDD108Z05410	5,410	.2130	6	183	170	1,1	36	233
3899584	TDD108Z05500	5,500	.2165	6	185	172	1,1	36	233
3899586	TDD108Z05800	5,800	.2283	6	190	176	1,2	36	233
3899587	TDD108Z06000	6,000	.2362	6	194	180	1,2	36	233
3899588	TDD108Z06200	6,200	.2441	7	211	196	1,3	38	267
3899589	TDD108Z06350	6,350	.2500	7	214	199	1,3	38	267
3899590	TDD108Z06500	6,500	.2559	7	217	202	1,4	38	267
3899592	TDD108Z06746	6,746	.2656	7	221	205	1,4	38	267
3899593	TDD108Z06800	6,800	.2677	7	222	206	1,4	38	267
3899594	TDD108Z06909	6,909	.2720	7	224	208	1,4	38	267
3899595	TDD108Z07000	7,000	.2756	7	226	210	1,5	38	267
3899600	TDD108Z07145	7,145	.2813	8	242	225	1,5	40	301
3899601	TDD108Z07500	7,500	.2953	8	249	232	1,6	40	301
3899653	TDD108Z07938	7,938	.3125	8	257	239	1,7	40	301
3899654	TDD108Z08000	8,000	.3150	8	258	240	1,7	40	301
3899657	TDD108Z08500	8,500	.3346	9	281	262	1,8	42	335
3899659	TDD108Z09000	9,000	.3543	9	290	270	1,9	42	335
3899661	TDD108Z09500	9,500	.3740	10	313	292	2,0	44	369
3899662	TDD108Z09525	9,525	.3750	10	313	292	2,0	44	369
3899663	TDD108Z09750	9,750	.3839	10	317	295	2,1	44	369
3899665	TDD108Z10000	10,000	.3937	10	322	300	2,1	44	369
3899666	TDD108Z10200	10,200	.4016	11	339	316	2,2	46	403
3899667	TDD108Z10320	10,317	.4062	11	341	318	2,2	46	403
3899668	TDD108Z10500	10,500	.4134	11	345	322	2,2	46	403
3899670	TDD108Z11000	11,000	.4331	11	354	330	2,3	46	403
3899671	TDD108Z11113	11,113	.4375	12	370	345	2,4	48	437
3899672	TDD108Z11500	11,500	.4528	12	377	352	2,4	48	437
3899674	TDD108Z12000	12,000	.4724	12	386	360	2,5	48	437
3899675	TDD108Z12304	12,304	.4844	13	405	378	2,6	50	471
3899676	TDD108Z12500	12,500	.4921	13	409	382	2,7	50	471
3899677	TDD108Z12700	12,700	.5000	13	412	385	2,7	50	471
3899678	TDD108Z13000	13,000	.5118	13	418	390	2,8	50	471

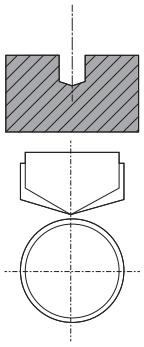
NOTE: Use TDS 40xx series as pilot drills, see page C44.

Application Data • TDD Series • WU20PD™ • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min		max	Recommended Feed Rate (fz) by Diameter Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	90	–	130	mm/r	0,08–0,12	0,12–0,18	0,18–0,20	0,20–0,22	0,22–0,25	0,25–0,28	0,28–0,30	0,30–0,34
	2	80	–	115	mm/r	0,08–0,12	0,12–0,18	0,18–0,20	0,20–0,22	0,22–0,25	0,25–0,28	0,28–0,30	0,30–0,34
	3	70	–	110	mm/r	0,05–0,10	0,10–0,16	0,16–0,18	0,18–0,20	0,20–0,22	0,22–0,24	0,24–0,26	0,26–0,28
	4	65	–	95	mm/r	0,05–0,10	0,10–0,16	0,16–0,18	0,18–0,20	0,20–0,22	0,22–0,24	0,24–0,26	0,26–0,28
K	1	105	–	145	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38
	2	85	–	120	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38
	3	100	–	140	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38

	Metric tolerance		
nominal size range	D1 tolerance	D1 tolerance	D tolerance h6
>3–6	0,000/-0,012	>3–6	0,000/-0,008
>6–10	0,000/-0,015	>6–10	0,000/-0,009
>10–13	0,000/-0,018	>10–13	0,000/-0,011

Deep-Hole Drills Application Rules

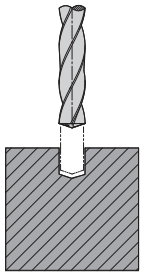


1) Pilot Drill Hole — IMPORTANT!

- The point angle of the pilot drill must be greater than one of the following deep-hole drills to protect its cutting corners.
- The diameter size of the pilot drill must be greater than one of the deep-hole drills to enable easy fit and protect margin lands. The required difference in diameter is covered by design with the different position of tolerance.
- Drill Ø = nominal Ø up to nominal +0,010mm.
- Depth of pilot hole: minimum 2 x D.
- Deeper pilot holes are preferable.

Recommendations:

- Use a conical (TDS*) or split-point drill to pilot (do not use a TDG, VariDrill™, or TDS 12 x D or any competitive drill).
- Check the pilot drill for wear, which can lead to premature wear on the TDD10* cutting edge and possibly catastrophic failure.
- TOP DRILL S™ for steel or cast iron (TDS4* series) and TOP DRILL S +™ for multiple applications (TDS501* series 3 x D and TD502* series 5 x D) with a 140° point angle are recommended.
- TDS503* series 8 x D and TDS504* series 12 x D is not recommended as the point angle is 132°!

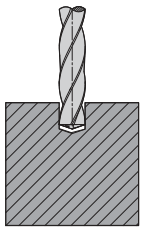


2) Feed TDD10* into Pilot Hole

- Max 500 RPM and recommended feed rate; no rapid traverse.
- Run counter-clockwise, especially in horizontal applications to protect the cutting edge, when entering the pilot hole.
- Depth: 1mm above the bottom of pilot hole.
- Feed TDD10* into pilot hole

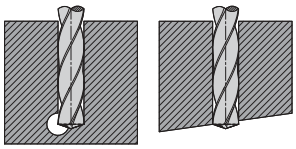
Recommendations:

- Reduce cutting speed to minimize imbalances in machine spindle/adapter!



3) Drill Hole

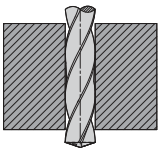
Cutting Parameters: Start recommended speed and feed rate at 1mm from the bottom of the pilot hole, clockwise.



Recommendations:

- DO NOT PECK OR DWELL up to 30 x D!
- With long-chipping steel materials, it may be necessary to increase feed rate by 10–20% to provide optimal chip control.
- For long-chipping aluminum materials, it may be necessary to decrease feed rate and increase speed.
- Reduce feed rate on angled exits and crossholes by 50–60%.

HP feed recommendations are usually higher than with competitive SC drills!



4) Drill Retraction

Cutting Parameters: 50–500 RPM and feed rate 2–6 m/min.

Recommendations:

To achieve the best tool performance, we recommend using the deep-hole drill with a hydraulic chuck.

Reduce cutting speed to minimize imbalances in machine spindle/adapter!

5) Vertical Applications

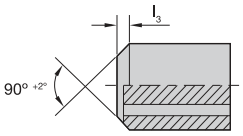
- If the pilot holes are close to each other, chips can fall into the neighboring hole.
- Do not enter a pilot hole that might contain chips with a deep hole drill to avoid chip jamming, wear, or breakage.
- If required holes are close to each other, use smart drilling strategies, make sure the pilot holes are getting properly cleaned, or switch to horizontal drilling.

Horizontal drilling process preferred for optimum chip evacuation.

Deep-Hole Drills Application Rules

6) Coolant

- For increased stability, the coolant channels of the TDD10* are smaller than on typical WIDIA™ drills.
- Steady supply of coolant delivered to the cutting edges necessary. If coolant supply is not steady or is unequal through both channels, check:
  - Coolant filtering system.
  - Sealing of adapter/spindle.
  - Chips blocking the coolant hole on the drill shank.
- Make sure that the coolant supply reaches the cutting edge before drilling begins.
- Pressure by diameter: <5mm 40–50 bar maximum; >5mm 25 bar minimum.



MQL back end according to DIN 69090-3

7) Minimal Quantity Lubrication

- On MQL applications, make sure that the coolant is directly supplied from the chuck into the back end of the drill shank (without gap) to avoid leakage.
- Pressure should be between 1–10 bar depending on coolant hole size.
- Spray contains an amount of oil less than 50 ml/h.
- If required, the shank can be evenly optimized for MQL applications with enlarged 90° chamfer instead of 40°.

8) Shanks

- Other than normal SC Drills, TDD10* series have a “Z” shank, increasing with 1mm steps.
- For drills with uneven shank size, use reduction sleeves to adapt the shank to the customer´s toolholder.
- The clamping force is better with increasing diameter.
- If required, DIN shanks (even, 2mm steps) are available as custom solutions.

Achieve the best tool performance with hydraulic chucks.

	12mm hydraulic reducer sleeve		20mm hydraulic reducer sleeve		25mm hydraulic reducer sleeve		32mm hydraulic reducer sleeve		.500" hydraulic reducer sleeve		.750" hydraulic reducer sleeve	
D1	order number	catalogue number	order number	catalogue number	order number	catalogue number	order number	catalogue number	order number	catalogue number	order number	catalogue number
3	3026450	12MHC030M	3026648	20MHC030M	3026662	25MHC030M	–	–	2248993	50HC030M	2248995	75HC030M
4	3026451	12MHC040M	3026649	20MHC040M	3026663	25MHC040M	–	–	1606050	50HC040M	2248996	75HC040M
5	3026452	12MHC050M	3026650	20MHC050M	3026664	25MHC050M	–	–	2248994	50HC050M	2248997	75HC050M
6	3026643	12MHC060M	3026651	20MHC060M	3026665	25MHC060M	3026675	32MHC060M	1606061	50HC060M	1093271	75HC060M
7	3026644	12MHC070M	3026652	20MHC070M	3026666	25MHC070M	3026676	32MHC070M	–	–	–	–
8	3026645	12MHC080M	3026653	20MHC080M	3026667	25MHC080M	3026677	32MHC080M	1606062	50HC080M	1093272	75HC080M
9	3026646	12MHC090M	3026654	20MHC090M	3026668	25MHC090M	3026678	32MHC090M	–	–	–	–
10	3026647	12MHC100M	3026655	20MHC100M	3026669	25MHC100M	3026679	32MHC100M	1606064	50HC100M	1093273	75HC100M
11	–	–	3026656	20MHC110M	–	–	3026680	32MHC110M	–	–	–	–
12	–	–	3026657	20MHC120M	3026669	25MHC120M	3026681	32MHC120M	–	–	1093524	75HC120M
13	–	–	3026658	20MHC130M	–	–	3026682	32MHC130M	–	–	–	–
14	–	–	3026659	20MHC140M	3026671	25MHC140M	3026683	32MHC140M	–	–	1093525	75HC140M
15	–	–	3026660	20MHC150M	–	–	3026684	32MHC150M	–	–	–	–
16	–	–	3026661	20MHC160M	3026672	25MHC160M	3026685	32MHC160M	–	–	1093526	75HC160M

The TDS solid carbide drills are primarily designed to be used as a pilot drill for the TDD Deep Hole drill in steel and cast iron applications.

140° point geometry
Low thrust with excellent centering capabilities

2-margin design provides stability and hole quality with less friction

30° helix with optimized flute profile and finish reduces risk of chip jamming

Sub-micron grain substrate
Superior resistance against drill breakage

The Solid Carbide TDS4 series is designed with a 140° point angle suited for pilot drill for the TDD series. Excellent centering and hole quality is attained by the TDS point and 2-margin design.

TDS40.. Steel
TDS45.. Stainless Steel
TDS41.. Cast Iron

WP20PD

P

WM15PD

M

WK15PD

K

PILOT DRILL

PRODUCT

TDS P Point with 140° P
point angle for excellent centering and low thrust

DIAMETER RANGE

3–13mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

DRILLING

FLOOD COOLANT: DRILLING

COOLANT: DRY: DRILLING

THROUGH COOLANT

MQL (MINIMUM QUANTITY LUBRICANT)

2 FLUTE/2 MARGIN/ COOLANT

HELIX ANGLE: 30º

PLAIN SHANK: ≤H6

DIN 6535

DIN 6537

SERIES	MATERIAL FIRST CHOICE	MATERIAL SECOND CHOICE	COOLANT	LENGTH RATIO	DIAMETER RANGE
TDS401	P	M	Through Coolant	3 x D	3,0–13,0mm
TDS451	M	P S	Through Coolant	3 x D	3,0–13,0mm
TDS411	K		Through Coolant	3 x D	3,0–13,0mm

5 x D and 8 x D available on WIDIA.com

Shank Style

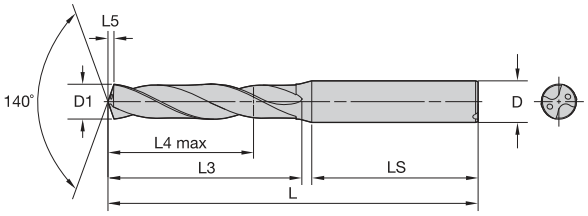
A - Shank DIN 6535 HA
(Round cylindrical)

TDS • Catalog Numbering System

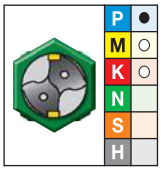
Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

TDS	4	0	1	A	06350	WP20PD
Top Drill Spiral	Flute Style - Coolant	Point	Length	Shank	Diameter in Metric	
	4 = 2 Flute Spiral Through Coolant, 2 margin lands	**0** = Cone Point Steel Specific	**1** = ~ 3 x D **2** = ~ 5 x D **3** = ~ 8 x D	**A** = Cylindrical Shank, DIN 6535 - 2mm steps	**03000** = 3,000mm **06350** = 1/4" = E	**W**IDIA™; **P** = Steel Application **20** & **25** = medium carbide, **P**VD coated, SC **D**rill

TDS401A • A-Shank • WP20PD™ • 3 x D



For information on L, L3, and L4 max, see page C29.

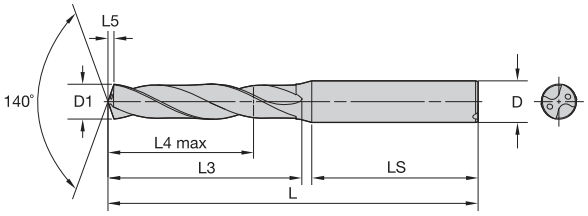


● first choice
○ alternate choice

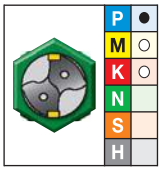
grade WP20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L	L3	L4 max	L5	LS	D
4163315	TDS401A03000	3,000	.1181	62	20	14	0,5	36	6
4163339	TDS401A03175	3,175	.1250	62	20	14	0,5	36	6
4163465	TDS401A03500	3,500	.1378	62	20	14	0,6	36	6
4163473	TDS401A03970	3,970	.1563	66	24	17	0,7	36	6
4163474	TDS401A04000	4,000	.1575	66	24	17	0,7	36	6
4163475	TDS401A04039	4,039	.1590	66	24	17	0,7	36	6
4163483	TDS401A04500	4,500	.1772	66	24	17	0,7	36	6
4163487	TDS401A04763	4,763	.1875	66	28	20	0,8	36	6
4163491	TDS401A05000	5,000	.1969	66	28	20	0,8	36	6
4163492	TDS401A05100	5,100	.2008	66	28	20	0,8	36	6
4163498	TDS401A05410	5,410	.2130	66	28	20	0,9	36	6
4163499	TDS401A05500	5,500	.2165	66	28	20	0,9	36	6
4163500	TDS401A05558	5,558	.2188	66	28	20	0,9	36	6
4163504	TDS401A05800	5,800	.2283	66	28	20	1,0	36	6
4163507	TDS401A06000	6,000	.2362	66	28	20	1,0	36	6
4163511	TDS401A06350	6,350	.2500	79	34	24	1,1	36	8
4163513	TDS401A06500	6,500	.2559	79	34	24	1,1	36	8
4163514	TDS401A06528	6,528	.2570	79	34	24	1,1	36	8
4163518	TDS401A06746	6,746	.2656	79	34	24	1,1	36	8
4163519	TDS401A06800	6,800	.2677	79	34	24	1,1	36	8
4163520	TDS401A06900	6,900	.2717	79	34	24	1,2	36	8
4163521	TDS401A07000	7,000	.2756	79	34	24	1,2	36	8
4163523	TDS401A07145	7,145	.2813	79	41	29	1,2	36	8
4163525	TDS401A07300	7,300	.2874	79	41	29	1,2	36	8
4163526	TDS401A07400	7,400	.2913	79	41	29	1,3	36	8
4163531	TDS401A07800	7,800	.3071	79	41	29	1,3	36	8
4163533	TDS401A07938	7,938	.3125	79	41	29	1,3	36	8
4163534	TDS401A08000	8,000	.3150	79	41	29	1,4	36	8
4163536	TDS401A08200	8,200	.3228	89	47	35	1,4	40	10
4163538	TDS401A08334	8,334	.3281	89	47	35	1,4	40	10
4163540	TDS401A08433	8,433	.3320	89	47	35	1,4	40	10
4163541	TDS401A08500	8,500	.3346	89	47	35	1,4	40	10
4163544	TDS401A08733	8,733	.3438	89	47	35	1,5	40	10
4163545	TDS401A08800	8,800	.3465	89	47	35	1,5	40	10
4163547	TDS401A09000	9,000	.3543	89	47	35	1,5	40	10
4163551	TDS401A09300	9,300	.3661	89	47	35	1,6	40	10
4163552	TDS401A09347	9,347	.3680	89	47	35	1,6	40	10
4163554	TDS401A09500	9,500	.3740	89	47	35	1,6	40	10
4163555	TDS401A09525	9,525	.3750	89	47	35	1,6	40	10
4163556	TDS401A09600	9,600	.3780	89	47	35	1,6	40	10
4162950	TDS401A10000	10,000	.3937	89	47	35	1,7	40	10
4162952	TDS401A10200	10,200	.4016	102	55	40	1,7	45	12
4163344	TDS401A10320	10,320	.4063	102	55	40	1,8	45	12
4163346	TDS401A10500	10,500	.4134	102	55	40	1,8	45	12
4163348	TDS401A10700	10,700	.4213	102	55	40	1,8	45	12
4163349	TDS401A10716	10,716	.4219	102	55	40	1,8	45	12
4163350	TDS401A10800	10,800	.4252	102	55	40	1,8	45	12
4163352	TDS401A11000	11,000	.4331	102	55	40	1,9	45	12
4163354	TDS401A11113	11,113	.4375	102	55	40	1,9	45	12
4163358	TDS401A11500	11,500	.4528	102	55	40	2,0	45	12
4163365	TDS401A12000	12,000	.4724	102	55	40	2,1	45	12
4163367	TDS401A12200	12,200	.4803	107	60	43	2,1	45	14
4163369	TDS401A12304	12,304	.4844	107	60	43	2,1	45	14
4163371	TDS401A12500	12,500	.4921	107	60	43	2,1	45	14
4163373	TDS401A12700	12,700	.5000	107	60	43	2,2	45	14
4163376	TDS401A13000	13,000	.5118	107	60	43	2,2	45	14

TDS401A • A-Shank • WP20PD™ • 3 x D

(continued)



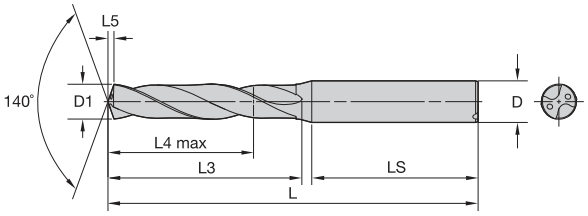
For information on L, L3, and L4 max, see page C29.



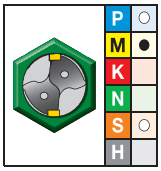
● first choice
○ alternate choice

grade WP20PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L	L3	L4 max	L5	LS	D
4163382	TDS401A13500	13,500	.5315	107	60	43	2,3	45	14
4163388	TDS401A14000	14,000	.5512	107	60	43	2,4	45	14
4163397	TDS401A14700	14,700	.5787	115	65	45	2,5	48	16
4163407	TDS401A15500	15,500	.6102	115	65	45	2,7	48	16

TDS451A • A-Shank • WM15PD™ • 3 x D



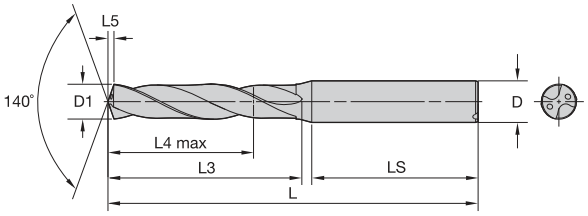
For information on L, L3, and L4 max, see page C29.



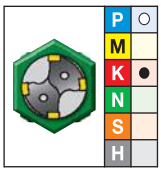
● first choice
○ alternate choice

grade WM15PD uncoated		D1 diameter							
order #	catalogue #	mm	in	L	L3	L4 max	L5	LS	D
6327750	TDS451A04852	4,852	.1910	66	28	20	0,8	36	6
6327752	TDS451A05000	5,000	.1969	66	28	20	0,8	36	6
6327772	TDS451A06350	6,350	.2500	79	34	24	1,1	36	8
6327779	TDS451A06746	6,746	.2656	79	34	24	1,1	36	8
6327780	TDS451A06800	6,800	.2677	79	34	24	1,1	36	8
6327795	TDS451A08000	8,000	.3150	79	41	29	1,4	36	8
6327806	TDS451A08800	8,800	.3465	89	47	35	1,5	40	10
6327808	TDS451A09000	9,000	.3543	89	47	35	1,5	40	10
6327817	TDS451A09600	9,600	.3780	89	47	35	1,6	40	10
6327822	TDS451A10000	10,000	.3937	89	47	35	1,7	40	10
6327844	TDS451A11000	11,000	.4331	102	55	40	1,9	45	12
6327845	TDS451A11100	11,100	.4370	102	55	40	1,9	45	12
6327857	TDS451A12000	12,000	.4724	102	55	40	2,1	45	12
6327869	TDS451A13096	13,096	.5156	107	60	43	2,3	45	14
6327884	TDS451A13500	13,500	.5315	107	60	43	2,3	45	14
6327887	TDS451A13800	13,800	.5433	107	60	43	2,4	45	14
6327890	TDS451A14000	14,000	.5512	107	60	43	2,4	45	14
6327917	TDS451A16200	16,200	.6378	123	73	51	2,8	48	18
6327928	TDS451A17100	17,100	.6732	123	73	51	3,0	48	18
6327930	TDS451A17300	17,300	.6811	123	73	51	3,0	48	18

TDS411A • A-Shank • WK15PD™ • 3 x D



For information on L, L3, and L4 max, see page C29.



● first choice
○ alternate choice

grade WK15PD AlCrN		D1 diameter							
order #	catalogue #	mm	in	L	L3	L4 max	L5	LS	D
4156605	TDS411A10300	10,300	.4055	102	55	40	1,8	45	12
4156614	TDS411A11000	11,000	.4331	102	55	40	1,9	45	12
4156633	TDS411A12500	12,500	.4921	107	60	43	2,1	45	14
4156638	TDS411A13000	13,000	.5118	107	60	43	2,2	45	14
4156644	TDS411A13500	13,500	.5315	107	60	43	2,3	45	14
4156675	TDS411A16000	16,000	.6299	115	65	45	2,8	48	16

Application Data • TDS Series • WP20PD™ • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
						Recommended Feed Rate (f) by Diameter							
P	0	80	–	180	mm/r	0,08—0,16	0,11—0,19	0,13—0,26	0,16—0,32	0,16—0,36	0,21—0,40	0,24—0,47	0,29—0,58
	1	80	–	180	mm/r	0,08—0,16	0,11—0,19	0,13—0,26	0,16—0,32	0,16—0,36	0,21—0,40	0,24—0,47	0,29—0,58
	2	80	–	160	mm/r	0,09—0,17	0,11—0,20	0,13—0,26	0,16—0,32	0,20—0,36	0,23—0,40	0,29—0,50	0,36—0,63
	3	80	–	160	mm/r	0,09—0,17	0,11—0,20	0,13—0,26	0,16—0,32	0,20—0,36	0,23—0,40	0,29—0,50	0,36—0,63
	4	80	–	140	mm/r	0,08—0,17	0,11—0,20	0,12—0,26	0,15—0,32	0,18—0,35	0,21—0,40	0,25—0,50	0,30—0,63
	5	50	–	80	mm/r	0,06—0,11	0,08—0,13	0,11—0,21	0,10—0,23	0,13—0,25	0,14—0,28	0,19—0,33	0,25—0,44
	6	50	–	80	mm/r	0,06—0,11	0,08—0,13	0,11—0,21	0,10—0,23	0,13—0,25	0,14—0,28	0,19—0,33	0,25—0,44
M	1	40	–	60	mm/r	0,05—0,09	0,06—0,12	0,08—0,14	0,09—0,16	0,11—0,18	0,13—0,21	0,15—0,23	0,17—0,26
	2	40	–	70	mm/r	0,05—0,11	0,07—0,13	0,09—0,14	0,11—0,19	0,11—0,21	0,13—0,23	0,15—0,26	0,17—0,29
	3	35	–	50	mm/r	0,05—0,09	0,07—0,12	0,08—0,13	0,09—0,16	0,11—0,18	0,13—0,20	0,15—0,22	0,17—0,26

Application Data • TDS Series • WM15PD™ • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
						Recommended Feed Rate (f) by Diameter							
P	0	80	–	160	mm/r	0,05–0,11	0,08–0,14	0,09–0,19	0,11–0,22	0,13–0,26	0,15–0,30	0,19–0,36	0,24–0,46
	1	70	–	140	mm/r	0,05–0,13	0,08–0,19	0,11–0,24	0,14–0,30	0,16–0,35	0,18–0,39	0,20–0,46	0,23–0,51
	2	90	–	140	mm/r	0,05–0,13	0,08–0,17	0,11–0,20	0,14–0,24	0,16–0,28	0,18–0,32	0,20–0,37	0,23–0,41
	3	60	–	100	mm/r	0,08–0,13	0,12–0,19	0,14–0,24	0,17–0,30	0,20–0,35	0,22–0,39	0,26–0,46	0,29–0,51
	4	50	–	100	mm/r	0,08–0,12	0,11–0,18	0,12–0,23	0,15–0,28	0,17–0,33	0,19–0,37	0,22–0,43	0,25–0,48
	5	50	–	80	mm/r	0,03–0,11	0,04–0,11	0,05–0,11	0,05–0,14	0,08–0,18	0,11–0,21	0,14–0,24	0,16–0,26
	6	40	–	70	mm/r	0,05–0,11	0,08–0,14	0,11–0,17	0,13–0,21	0,15–0,24	0,17–0,27	0,19–0,33	0,22–0,36
M	1	50	–	90	mm/r	0,05–0,13	0,06–0,14	0,08–0,16	0,10–0,18	0,12–0,20	0,13–0,21	0,16–0,24	0,18–0,26
	2	50	–	80	mm/r	0,05–0,13	0,06–0,14	0,08–0,16	0,10–0,18	0,12–0,20	0,13–0,21	0,16–0,24	0,18–0,26
	3	50	–	70	mm/r	0,05–0,13	0,06–0,14	0,08–0,16	0,10–0,18	0,12–0,20	0,13–0,21	0,16–0,24	0,18–0,26
S	1	20	–	30	mm/r	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	2	10	–	30	mm/r	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	3	10	–	40	mm/r	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	4	10	–	40	mm/r	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16

Application Data • TDS Series • WK15PD™ • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
						Recommended Feed Rate (f) by Diameter							
K	1	80	–	190	mm/r	0,11—0,22	0,12—0,24	0,16—0,31	0,20—0,38	0,23—0,44	0,25—0,49	0,31—0,60	0,38—0,74
	2	90	–	170	mm/r	0,12—0,16	0,13—0,19	0,16—0,25	0,20—0,31	0,23—0,36	0,25—0,40	0,31—0,48	0,38—0,60
	3	80	–	150	mm/r	0,08—0,17	0,09—0,19	0,12—0,25	0,14—0,30	0,17—0,35	0,19—0,40	0,24—0,48	0,30—0,60

	Metric tolerance	
nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

TOP DRILL™ Modular X

TDMX™

The TDMX modular drill will deliver maximum clamping stability between the carbide insert and the pocket seat, enabling safe operations under unstable conditions using material-specific point geometries and grades.

Extra stable pocket seat design to increase stability to securely face high demanding applications.

Coolant channels exit behind the cutting edge to ensure the best coolant delivery.

Two standard screws clamp and unclamp the insert, without disassembling the tool from the holder.

Margin lands on the entire body length to ensure straightness and increased hole quality.

Polished flutes Improved chip evacuation.

The TDMX modular drilling line features material-specific inserts seated in an advanced pocket seat design which maximizes the insert clamping rigidity and enables higher productivity even under unstable machining conditions.

TDMX heads can be re-conditioned to increase the total life cycle of the tool.

PK

P K

First choice for steel and cast iron drilling.

FPE

P M K

Flat bottom drilling, stacked plates, piloting for deep hole drilling.

MS

M S

First choice for stainless steel and super alloys.

MODULAR STABILITY

PRODUCT

POINT GEOMETRY/GRADE

FPE / WP40PD
PK / WP40PD
MS / WM15PD

DIAMETER RANGE

16–40mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

FIRST CHOICE

P M K S

APPLICATIONS

DRILLING

INCLINED ENTRY

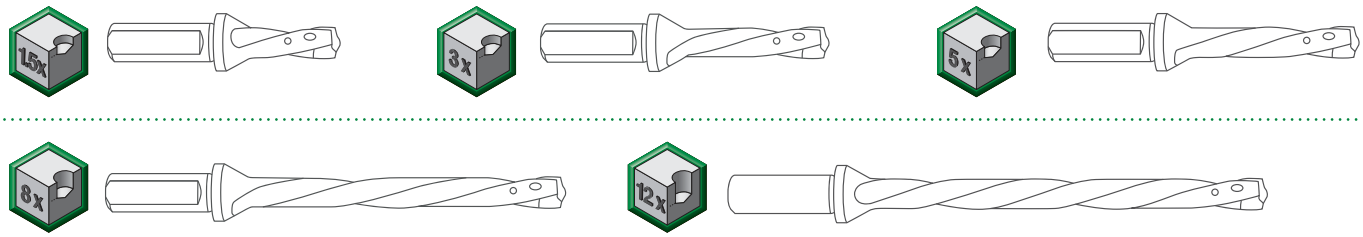
INCLINED EXIT

CROSS HOLES

STACKED PLATES

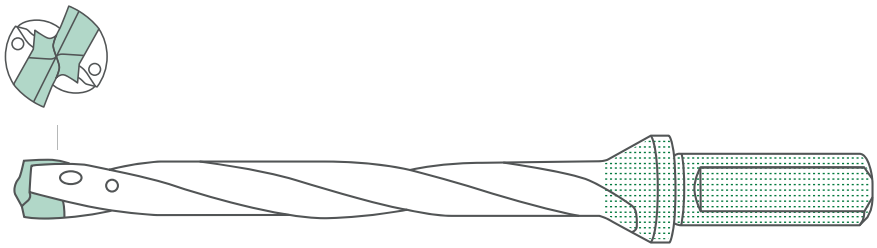
FLAT BOTTOM

STEEL BODIES



FLANGED SHANK

Increase overall drill stability in deep-drilling applications. Suitable for machining and turning centers.



TDMX™ Inserts • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

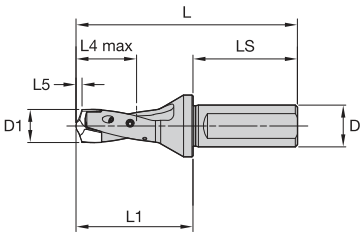
TDMX	20000	PK	M	WP40PD
TOP DRILL™ Modular X	Insert Diameter	Insert Geometry	Metric Insert	Grade
	Metric = 20mm	**PK** = steel and cast iron		**W**IDIA™; **P** = Primarily steel Application **30 & 40** = tough carbide, **P**VD coated, Modular **D**rilling Insert

TDMX Bodies • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

TDMX	200	R5	SL	25	M
TOP DRILL Modular X	Drill Body Diameter	L/D Ratio	Shank Style	Shank Diameter	Metric Insert
	Metric = 20mm	5 x D	**S**ide **L**ock	25mm	

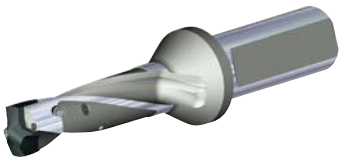
TOP DRILL Modular X • 1.5 x D • Side Lock Shank • Metric

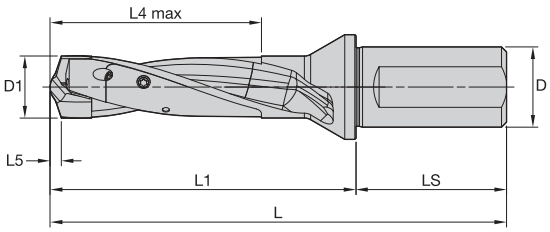


order number	catalogue number	SSC	D1	D1 max	LS	D	L	L1	L4 max
6680951	TDMX160R1SL20M	A	16,000	16,999	50	20	106	56	26
6680952	TDMX170R1SL20M	B	17,000	17,999	50	20	109	59	27
6680953	TDMX180R1SL25M	C	18,000	18,999	56	25	118	62	29
6680954	TDMX190R1SL25M	D	19,000	19,999	56	25	121	65	30
6680955	TDMX200R1SL25M	E	20,000	20,999	56	25	124	68	32
6680956	TDMX210R1SL25M	F	21,000	21,999	56	25	127	71	33
6680957	TDMX220R1SL25M	G	22,000	22,999	56	25	130	74	35
6680958	TDMX230R1SL25M	H	23,000	23,999	56	25	133	77	36
6680959	TDMX240R1SL32M	I	24,000	24,999	60	32	140	80	38
6680960	TDMX250R1SL32M	J	25,000	25,999	60	32	143	83	39
6680971	TDMX260R1SL32M	K	26,000	26,999	60	32	146	86	41
6680972	TDMX270R1SL32M	L	27,000	27,999	60	32	149	89	42
6680973	TDMX280R1SL32M	M	28,000	28,999	60	32	152	92	44
6680974	TDMX290R1SL32M	N	29,000	29,999	60	32	155	95	45
6680975	TDMX300R1SL32M	O	30,000	30,999	60	32	158	98	47
6680976	TDMX310R1SL32M	P	31,000	31,999	60	32	161	101	48

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
L5 is dependent on the insert.

TOP DRILL Modular X • 3 x D • Side Lock Shank • Metric

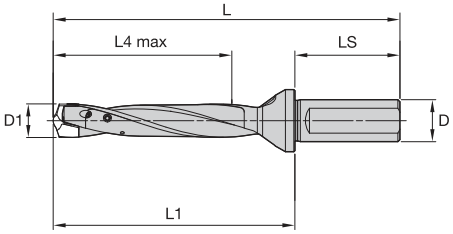




order number	catalogue number	SSC	D1	D1 max	LS	D	L	L1	L4 max
6572091	TDMX160R3SL20M	A	16,000	16,999	50	20	131	81	51
6572092	TDMX170R3SL20M	B	17,000	17,999	50	20	136	86	54
6572093	TDMX180R3SL25M	C	18,000	18,999	56	25	146	90	57
6572094	TDMX190R3SL25M	D	19,000	19,999	56	25	151	95	60
6572096	TDMX200R3SL25M	E	20,000	20,999	56	25	155	99	63
6572097	TDMX210R3SL25M	F	21,000	21,999	56	25	160	104	66
6572098	TDMX220R3SL25M	G	22,000	22,999	56	25	164	108	69
6572099	TDMX230R3SL25M	H	23,000	23,999	56	25	169	113	72
6572100	TDMX240R3SL32M	I	24,000	24,999	60	32	177	117	75
6572101	TDMX250R3SL32M	J	25,000	25,999	60	32	182	122	78
6572102	TDMX260R3SL32M	K	26,000	26,999	60	32	186	126	81
6572104	TDMX270R3SL32M	L	27,000	27,999	60	32	191	131	84
6572105	TDMX280R3SL32M	M	28,000	28,999	60	32	195	135	87
6572106	TDMX290R3SL32M	N	29,000	29,999	60	32	200	140	90
6572107	TDMX300R3SL32M	O	30,000	30,999	60	32	204	144	93
6572108	TDMX310R3SL32M	P	31,000	31,999	60	32	209	149	96
6572109	TDMX320R3SL40M	Q	32,000	33,999	70	40	228	158	102
6572110	TDMX340R3SL40M	R	34,000	35,999	70	40	237	167	108
6572121	TDMX360R3SL40M	S	36,000	37,999	70	40	246	176	114
6572122	TDMX380R3SL40M	T	38,000	40,000	70	40	255	185	120

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
L5 is dependent on the insert.

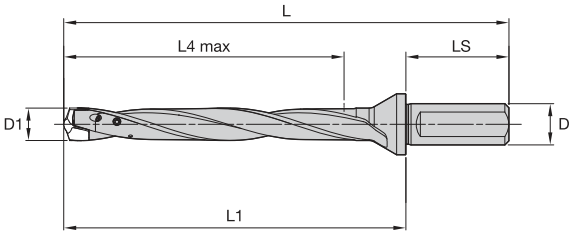
TOP DRILL Modular X • 5 x D • Side Lock Shank • Metric



order number	catalogue number	SSC	D1	D1 max	LS	D	L	L1	L4 max
6572125	TDMX160R5SL20M	A	16,000	16,999	50	20	165	115	85
6572126	TDMX170R5SL20M	B	17,000	17,999	50	20	172	122	90
6572127	TDMX180R5SL25M	C	18,000	18,999	56	25	184	128	95
6572128	TDMX190R5SL25M	D	19,000	19,999	56	25	191	135	100
6572129	TDMX200R5SL25M	E	20,000	20,999	56	25	197	141	105
6572130	TDMX210R5SL25M	F	21,000	21,999	56	25	204	148	110
6572141	TDMX220R5SL25M	G	22,000	22,999	56	25	210	154	115
6572142	TDMX230R5SL25M	H	23,000	23,999	56	25	217	161	120
6572143	TDMX240R5SL32M	I	24,000	24,999	60	32	227	167	125
6572144	TDMX250R5SL32M	J	25,000	25,999	60	32	234	174	130
6572145	TDMX260R5SL32M	K	26,000	26,999	60	32	240	180	135
6572146	TDMX270R5SL32M	L	27,000	27,999	60	32	247	187	140
6572147	TDMX280R5SL32M	M	28,000	28,999	60	32	253	193	145
6572148	TDMX290R5SL32M	N	29,000	29,999	60	32	260	200	150
6572149	TDMX300R5SL32M	O	30,000	30,999	60	32	266	206	155
6572150	TDMX310R5SL32M	P	31,000	31,999	60	32	273	213	160
6572151	TDMX320R5SL40M	Q	32,000	33,999	70	40	296	226	170
6572152	TDMX340R5SL40M	R	34,000	35,999	70	40	309	239	180
6572153	TDMX360R5SL40M	S	36,000	37,999	70	40	322	252	190
6572154	TDMX380R5SL40M	T	38,000	40,000	70	40	335	265	200

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
L5 is dependent on the insert.

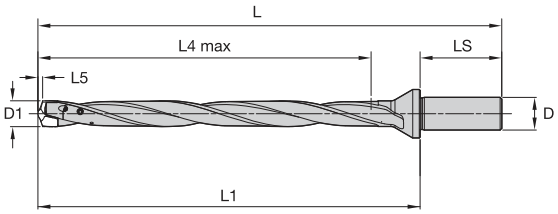
TOP DRILL Modular X • 8 x D • Side Lock Shank • Metric



order number	catalogue number	SSC	D1	D1 max	LS	D	L	L1	L4 max
6572155	TDMX160R8SL20M	A	16,000	16,999	50	20	216	166	136
6572156	TDMX170R8SL20M	B	17,000	17,999	50	20	226	176	144
6572157	TDMX180R8SL25M	C	18,000	18,999	56	25	241	185	152
6572158	TDMX190R8SL25M	D	19,000	19,999	56	25	251	195	160
6572159	TDMX200R8SL25M	E	20,000	20,999	56	25	260	204	168
6572160	TDMX210R8SL25M	F	21,000	21,999	56	25	270	214	176
6572171	TDMX220R8SL25M	G	22,000	22,999	56	25	279	223	184
6572172	TDMX230R8SL25M	H	23,000	23,999	56	25	289	233	192
6572173	TDMX240R8SL32M	I	24,000	24,999	60	32	302	242	200
6572174	TDMX250R8SL32M	J	25,000	25,999	60	32	312	252	208
6572175	TDMX260R8SL32M	K	26,000	26,999	60	32	321	261	216
6572176	TDMX270R8SL32M	L	27,000	27,999	60	32	331	271	224
6572177	TDMX280R8SL32M	M	28,000	28,999	60	32	340	280	232
6572178	TDMX290R8SL32M	N	29,000	29,999	60	32	350	290	240
6572179	TDMX300R8SL32M	O	30,000	30,999	60	32	359	299	248
6572180	TDMX310R8SL32M	P	31,000	31,999	60	32	369	309	256
6572181	TDMX320R8SL40M	Q	32,000	33,999	70	40	398	328	272
6572182	TDMX340R8SL40M	R	34,000	35,999	70	40	417	374	288
6572183	TDMX360R8SL40M	S	36,000	37,999	70	40	436	366	304
6572184	TDMX380R8SL40M	T	38,000	40,000	70	40	455	385	320

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
L5 is dependent on the insert.

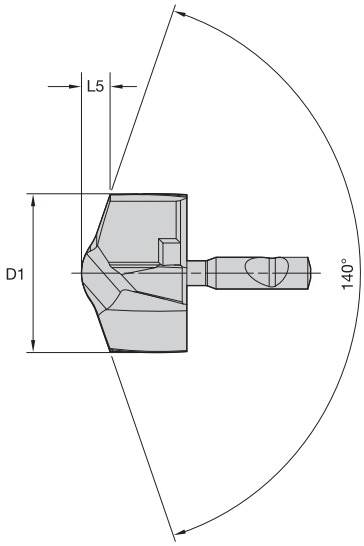
TOP DRILL Modular X • 12 x D • Flanged Round Shank • Metric



order number	catalogue number	SSC	D1	D1 max	LS	D	L	L1	L4 max
6681017	TDMX160R12SF20M	A	16,000	16,999	50	20	284	234	204
6681018	TDMX170R12SF20M	B	17,000	17,999	50	20	298	248	216
6681019	TDMX180R12SF25M	C	18,000	18,999	56	25	317	261	228
6681020	TDMX190R12SF25M	D	19,000	19,999	56	25	331	275	240
6681041	TDMX200R12SF25M	E	20,000	20,999	56	25	344	288	252
6681042	TDMX210R12SF25M	F	21,000	21,999	56	25	358	302	264
6681043	TDMX220R12SF25M	G	22,000	22,999	56	25	371	315	276
6681044	TDMX230R12SF25M	H	23,000	23,999	56	25	385	329	288
6681045	TDMX240R12SF32M	I	24,000	24,999	60	32	402	342	300
6681046	TDMX250R12SF32M	J	25,000	25,999	60	32	416	356	312
6681047	TDMX260R12SF32M	K	26,000	26,999	60	32	429	369	324
6681049	TDMX270R12SF32M	L	27,000	27,999	60	32	443	383	336
6681050	TDMX280R12SF32M	M	28,000	28,999	60	32	456	396	348
6681051	TDMX290R12SF32M	N	29,000	29,999	60	32	470	410	360
6681052	TDMX300R12SF32M	O	30,000	30,999	60	32	483	423	372
6681053	TDMX310R12SF32M	P	31,000	31,999	60	32	497	437	384

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
L5 is dependent on the insert.

TOP DRILL Modular X • Inserts • PK



● first choice
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P		●
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catalogue number	D1	L5	SSC	WP40PD
TDMX16000PKM	16,00	3,21	A	6568446
TDMX16200PKM	16,20	3,25	A	6568447
TDMX16281PKM	16,28	3,26	A	6568448
TDMX16500PKM	16,50	3,30	A	6568449
TDMX16667PKM	16,67	3,33	A	6568450
TDMX17000PKM	17,00	3,39	B	6568461
TDMX17064PKM	17,06	3,41	B	6568462
TDMX17463PKM	17,46	3,48	B	6568464
TDMX17500PKM	17,50	3,49	B	6568465
TDMX17600PKM	17,60	3,50	B	6568467
TDMX17800PKM	17,80	3,54	B	6568471
TDMX17859PKM	17,86	3,55	B	6568472
TDMX18000PKM	18,00	3,58	C	6568473
TDMX18255PKM	18,26	3,64	C	6568474
TDMX18500PKM	18,50	3,68	C	6568475
TDMX18651PKM	18,65	3,71	C	6568476
TDMX18800PKM	18,80	3,74	C	6568477
TDMX19000PKM	19,00	3,78	D	6568478
TDMX19050PKM	19,05	3,78	D	6568479
TDMX19200PKM	19,20	3,81	D	6568480
TDMX19270PKM	19,27	3,82	D	6568481
TDMX19450PKM	19,45	3,86	D	6568482
TDMX19500PKM	19,50	3,87	D	6568483
TDMX19700PKM	19,70	3,90	D	6568484
TDMX19840PKM	19,84	3,93	D	6568485
TDMX20000PKM	20,00	3,97	E	6568813
TDMX20100PKM	20,10	3,99	E	6568814
TDMX20200PKM	20,20	4,01	E	6568815
TDMX20239PKM	20,24	4,02	E	6568816
TDMX20300PKM	20,30	4,03	E	6568817
TDMX20400PKM	20,40	4,05	E	6568818
TDMX20500PKM	20,50	4,06	E	6568819
TDMX20600PKM	20,60	4,08	E	6568820
TDMX20650PKM	20,65	4,09	E	6568841
TDMX20700PKM	20,70	4,10	E	6568842
TDMX20800PKM	20,80	4,12	E	6568843
TDMX20900PKM	20,90	4,14	E	6568844
TDMX21000PKM	21,00	4,16	F	6568845
TDMX21430PKM	21,43	4,23	F	6568846
TDMX21500PKM	21,50	4,25	F	6568847
TDMX22000PKM	22,00	4,35	G	6568848
TDMX22225PKM	22,23	4,39	G	6568849
TDMX22450PKM	22,45	4,44	G	6568850
TDMX22500PKM	22,50	4,44	G	6568851
TDMX23000PKM	23,00	4,54	H	6568852
TDMX23500PKM	23,50	4,63	H	6568853
TDMX23813PKM	23,81	4,68	H	6568854
TDMX24000PKM	24,00	4,73	I	6568856
TDMX24500PKM	24,50	4,82	I	6568857
TDMX24605PKM	24,61	4,84	I	6568858
TDMX25000PKM	25,00	4,91	J	6568859
TDMX25400PKM	25,40	4,99	J	6568860

TOP DRILL Modular X • Inserts • PK

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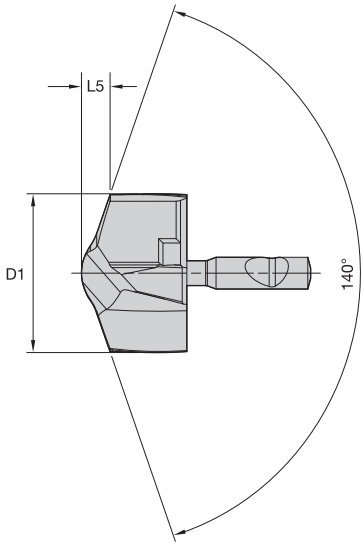

● first choice
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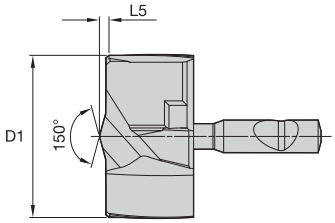
catalogue number	D1	L5	SSC	WP40PD
TDMX25500PKM	25,50	5,01	J	6568861
TDMX25670PKM	25,67	5,04	J	6568862
TDMX25700PKM	25,70	5,04	J	6568863
TDMX25760PKM	25,76	5,05	J	6568864
TDMX25796PKM	25,80	5,06	J	6568865
TDMX26000PKM	26,00	5,11	K	6568866
TDMX26192PKM	26,19	5,15	K	6568867
TDMX26400PKM	26,40	5,18	K	6568868
TDMX26500PKM	26,50	5,20	K	6568869
TDMX26589PKM	26,59	5,22	K	6568870
TDMX27000PKM	27,00	5,29	L	6568871
TDMX27500PKM	27,50	5,38	L	6568872
TDMX27780PKM	27,78	5,43	L	6568873
TDMX28000PKM	28,00	5,49	M	6568874
TDMX28176PKM	28,18	5,52	M	6568875
TDMX28500PKM	28,50	5,58	M	6568876
TDMX28575PKM	28,58	5,59	M	6568877
TDMX29000PKM	29,00	5,67	N	6568878
TDMX29367PKM	29,37	5,74	N	6568879
TDMX29500PKM	29,50	5,76	N	6568880
TDMX29764PKM	29,76	5,81	N	6568891
TDMX30000PKM	30,00	5,87	O	6568892
TDMX30163PKM	30,16	5,90	O	6568893
TDMX30500PKM	30,50	5,96	O	6568896
TDMX30955PKM	30,96	6,04	O	6568897
TDMX31000PKM	31,00	6,05	P	6568898
TDMX31500PKM	31,50	6,14	P	6568899
TDMX31750PKM	31,75	6,18	P	6568900
TDMX32000PKM	32,00	6,25	Q	6568901
TDMX32500PKM	32,50	6,34	Q	6568902
TDMX33000PKM	33,00	6,43	Q	6568903
TDMX33338PKM	33,34	6,49	Q	6568904
TDMX34000PKM	34,00	6,61	R	6568905
TDMX34130PKM	34,13	6,64	R	6568906
TDMX34925PKM	34,93	6,78	R	6568907
TDMX35000PKM	35,00	6,79	R	6568908
TDMX35500PKM	35,50	6,89	R	6568909
TDMX36000PKM	36,00	7,00	S	6568910
TDMX36500PKM	36,50	7,09	S	6568911
TDMX37000PKM	37,00	7,18	S	6568912
TDMX37500PKM	37,50	7,27	S	6568913
TDMX38000PKM	38,00	7,36	T	6568914
TDMX38100PKM	38,10	7,38	T	6568915
TDMX38500PKM	38,50	7,46	T	6568916
TDMX39000PKM	39,00	7,55	T	6568917
TDMX39289PKM	39,29	7,60	T	6568918
TDMX39500PKM	39,50	7,64	T	6568919
TDMX40000PKM	40,00	7,73	T	6568920

TOP DRILL Modular X • Inserts • FPE



● first choice
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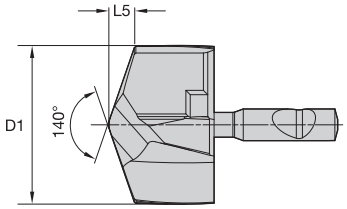
catalogue number	D1	L5	SSC	WP40PD
TDMX16000FPEM	16,00	1,16	A	6693048
TDMX16281FPEM	16,28	1,17	A	6693049
TDMX16500FPEM	16,50	1,17	A	6693050
TDMX16667FPEM	16,67	1,17	A	6693111
TDMX17000FPEM	17,00	1,18	B	6693112
TDMX17064FPEM	17,06	1,18	B	6693113
TDMX17500FPEM	17,50	1,19	B	6693114
TDMX18000FPEM	18,00	1,28	C	6693115
TDMX18500FPEM	18,50	1,28	C	6693116
TDMX19000FPEM	19,00	1,29	D	6693117
TDMX19050FPEM	19,05	1,29	D	6693118
TDMX19500FPEM	19,50	1,30	D	6693119
TDMX19840FPEM	19,84	1,31	D	6693120
TDMX20000FPEM	20,00	1,39	E	6693131
TDMX20500FPEM	20,50	1,40	E	6693132
TDMX21000FPEM	21,00	1,40	F	6693133
TDMX21500FPEM	21,50	1,41	F	6693134
TDMX22000FPEM	22,00	1,50	G	6693135
TDMX22500FPEM	22,50	1,51	G	6693136
TDMX23000FPEM	23,00	1,51	H	6693137
TDMX23500FPEM	23,50	1,52	H	6693138
TDMX24000FPEM	24,00	1,61	I	6693139
TDMX24500FPEM	24,50	1,62	I	6693140
TDMX25000FPEM	25,00	1,62	J	6693151
TDMX25400FPEM	25,40	1,63	J	6693152
TDMX25500FPEM	25,50	1,63	J	6693153
TDMX26000FPEM	26,00	1,72	K	6693154
TDMX26400FPEM	26,40	1,72	K	6693194
TDMX26500FPEM	26,50	1,72	K	6693155
TDMX27000FPEM	27,00	1,73	L	6693156
TDMX27500FPEM	27,50	1,74	L	6693157
TDMX28000FPEM	28,00	1,83	M	6693158
TDMX28500FPEM	28,50	1,83	M	6693160
TDMX29000FPEM	29,00	1,84	N	6693161
TDMX29500FPEM	29,50	1,85	N	6693162
TDMX30000FPEM	30,00	1,93	O	6693163
TDMX30500FPEM	30,50	1,94	O	6693164
TDMX31000FPEM	31,00	1,94	P	6693165
TDMX31500FPEM	31,50	1,95	P	6693166
TDMX31750FPEM	31,75	1,95	P	6693167
TDMX32000FPEM	32,00	2,08	Q	6693168
TDMX32500FPEM	32,50	2,08	Q	6693169
TDMX33000FPEM	33,00	2,09	Q	6693170
TDMX34000FPEM	34,00	2,10	R	6693181
TDMX35000FPEM	35,00	2,11	R	6693182
TDMX35500FPEM	35,50	2,12	R	6693183
TDMX36000FPEM	36,00	2,29	S	6693184
TDMX36500FPEM	36,50	2,29	S	6693185
TDMX37000FPEM	37,00	2,30	S	6693186
TDMX37500FPEM	37,50	2,30	S	6693187
TDMX38000FPEM	38,00	2,31	T	6693188
TDMX38100FPEM	38,10	2,31	T	6693189
TDMX38500FPEM	38,50	2,32	T	6693190
TDMX39000FPEM	39,00	2,32	T	6693191
TDMX39500FPEM	39,50	2,33	T	6693192
TDMX40000FPEM	40,00	2,33	T	6693193

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

TOP DRILL Modular X • Inserts • MS



● first choice
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catalogue number	D1	L5	SSC	WM15PD
TDMX16000MSM	16,00	2,84	A	6568922
TDMX16200MSM	16,20	2,88	A	6568923
TDMX16281MSM	16,28	2,89	A	6568924
TDMX16500MSM	16,50	2,93	A	6568925
TDMX16667MSM	16,67	2,96	A	6568926
TDMX17000MSM	17,00	3,01	B	6568927
TDMX17064MSM	17,06	3,02	B	6568929
TDMX17463MSM	17,46	3,09	B	6568930
TDMX17500MSM	17,50	3,10	B	6568931
TDMX17600MSM	17,60	3,12	B	6568932
TDMX17800MSM	17,80	3,15	B	6568933
TDMX17859MSM	17,86	3,16	B	6568934
TDMX18000MSM	18,00	3,19	C	6568935
TDMX18255MSM	18,26	3,24	C	6568938
TDMX18500MSM	18,50	3,28	C	6568939
TDMX18651MSM	18,65	3,30	C	6568940
TDMX18800MSM	18,80	3,33	C	6568941
TDMX19000MSM	19,00	3,36	D	6568942
TDMX19050MSM	19,05	3,37	D	6568943
TDMX19200MSM	19,20	3,40	D	6568944
TDMX19270MSM	19,27	3,41	D	6568945
TDMX19450MSM	19,45	3,44	D	6568946
TDMX19500MSM	19,50	3,45	D	6568947
TDMX19700MSM	19,70	3,48	D	6568948
TDMX19840MSM	19,84	3,51	D	6568949
TDMX20000MSM	20,00	3,54	E	6568961
TDMX20100MSM	20,10	3,56	E	6568962
TDMX20200MSM	20,20	3,57	E	6568963
TDMX20239MSM	20,24	3,58	E	6568964
TDMX20300MSM	20,30	3,59	E	6568965
TDMX20400MSM	20,40	3,61	E	6568966
TDMX20500MSM	20,50	3,63	E	6568967
TDMX20600MSM	20,60	3,64	E	6568968
TDMX20650MSM	20,65	3,65	E	6568969
TDMX20700MSM	20,70	3,66	E	6568973
TDMX20800MSM	20,80	3,68	E	6568980
TDMX20900MSM	20,90	3,69	E	6568981
TDMX21000MSM	21,00	3,71	F	6568982
TDMX21430MSM	21,43	3,79	F	6568983
TDMX21500MSM	21,50	3,80	F	6568984
TDMX22000MSM	22,00	3,89	G	6568985
TDMX22225MSM	22,23	3,93	G	6568986
TDMX22450MSM	22,45	3,97	G	6568987
TDMX22500MSM	22,50	3,97	G	6568988
TDMX23000MSM	23,00	4,06	H	6568989
TDMX23500MSM	23,50	4,15	H	6568990
TDMX23813MSM	23,81	4,20	H	6568991
TDMX24000MSM	24,00	4,24	I	6568993
TDMX24500MSM	24,50	4,32	I	6568994
TDMX24605MSM	24,61	4,34	I	6568995
TDMX25000MSM	25,00	4,41	J	6568996
TDMX25400MSM	25,40	4,48	J	6568998
TDMX25500MSM	25,50	4,49	J	6568999
TDMX25670MSM	25,67	4,52	J	6569000
TDMX25700MSM	25,70	4,53	J	6569001
TDMX25760MSM	25,76	4,54	J	6569002
TDMX25796MSM	25,80	4,55	J	6569003
TDMX26000MSM	26,00	4,59	K	6569006
TDMX26192MSM	26,19	4,62	K	6569007
TDMX26400MSM	26,40	4,65	K	6569008
TDMX26500MSM	26,50	4,67	K	6569009
TDMX26589MSM	26,59	4,69	K	6569010
TDMX27000MSM	27,00	4,76	L	6569502
TDMX27500MSM	27,50	4,84	L	6569503
TDMX27780MSM	27,78	4,89	L	6569504
TDMX28000MSM	28,00	4,93	M	6569505
TDMX28176MSM	28,18	4,96	M	6569506
TDMX28500MSM	28,50	5,02	M	6569507

TOP DRILL Modular X • Inserts • MS

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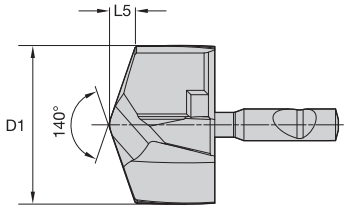

● first choice
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catalogue number	D1	L5	SSC	WM15PD
TDMX28575MSM	28,58	5,03	M	6569508
TDMX29000MSM	29,00	5,11	N	6569509
TDMX29367MSM	29,37	5,17	N	6569510
TDMX29500MSM	29,50	5,19	N	6569521
TDMX29764MSM	29,76	5,24	N	6569522
TDMX30000MSM	30,00	5,28	O	6569523
TDMX30163MSM	30,16	5,31	O	6569524
TDMX30500MSM	30,50	5,37	O	6569525
TDMX30955MSM	30,96	5,45	O	6569526
TDMX31000MSM	31,00	5,45	P	6569527
TDMX31500MSM	31,50	5,54	P	6569528
TDMX31750MSM	31,75	5,58	P	6569529
TDMX32000MSM	32,00	5,63	Q	6569530
TDMX32500MSM	32,50	5,72	Q	6569531
TDMX33000MSM	33,00	5,80	Q	6569532
TDMX33338MSM	33,34	5,86	Q	6569533
TDMX34000MSM	34,00	5,98	R	6569534
TDMX34130MSM	34,13	6,00	R	6569535
TDMX34925MSM	34,93	6,13	R	6569536
TDMX35000MSM	35,00	6,15	R	6569537
TDMX35500MSM	35,50	6,23	R	6569538
TDMX36000MSM	36,00	6,33	S	6569539
TDMX36500MSM	36,50	6,41	S	6569540
TDMX37000MSM	37,00	6,50	S	6569551
TDMX37500MSM	37,50	6,59	S	6569552
TDMX38000MSM	38,00	6,67	T	6569553
TDMX38100MSM	38,10	6,69	T	6569554
TDMX38289MSM	38,29	6,72	T	6569557
TDMX38500MSM	38,50	6,76	T	6569555
TDMX39000MSM	39,00	6,84	T	6569556
TDMX39500MSM	39,50	6,93	T	6569558
TDMX40000MSM	40,00	7,01	T	6569559

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

D1	Metric tolerance tolerance k8
8–10	0,000/+0,022
>10–17	0,000/+0,027
>17–18	0,000/+0,027
>18–21	0,000/+0,033

Application Data • PK • WP40PD™ • Metric

Material Group		Cutting Speed — Vc Range — m/min			Recommended Feed Rate (f) by Diameter					
		min	Starting Value	max	Tool Diameter (mm)	16,0	20,0	25,0	32,0	40,0
P	1	90	**125**	170	mm/r	0,19–0,45	0,25–0,48	0,25–0,52	0,28–0,57	0,29–0,60
	2	105	**140**	180	mm/r	0,23–0,46	0,28–0,50	0,30–0,52	0,33–0,57	0,35–0,60
	3	50	**75**	100	mm/r	0,23–0,46	0,28–0,50	0,30–0,52	0,33–0,57	0,35–0,60
	4	50	**75**	100	mm/r	0,19–0,45	0,22–0,48	0,25–0,50	0,28–0,55	0,29–0,58
	5	50	**65**	80	mm/r	0,16–0,32	0,18–0,36	0,22–0,42	0,24–0,46	0,25–0,48
	6	50	**65**	80	mm/r	0,16–0,32	0,18–0,36	0,22–0,42	0,24–0,46	0,25–0,48
M	1	40	**80**	110	mm/r	0,11–0,26	0,13–0,28	0,13–0,32	0,14–0,35	0,15–0,37
	2	35	**55**	75	mm/r	0,11–0,26	0,13–0,28	0,13–0,32	0,14–0,35	0,15–0,37
	3	20	**35**	50	mm/r	0,11–0,26	0,13–0,28	0,13–0,32	0,14–0,35	0,15–0,37
K	1	60	**95**	170	mm/r	0,25–0,48	0,28–0,52	0,32–0,56	0,35–0,62	0,37–0,65
	2	60	**75**	90	mm/r	0,25–0,48	0,28–0,52	0,32–0,56	0,35–0,62	0,37–0,65
	3	40	**65**	90	mm/r	0,21–0,44	0,23–0,48	0,25–0,50	0,28–0,55	0,29–0,58

NOTE: Through coolant recommended for greater than 3 x D applications.
Material group M is recommended for secondary applications.

Application Data • FPE • WP40PD • Metric

Material Group		Cutting Speed — Vc Range — m/min			Recommended Feed Rate (f) by Diameter					
		min	Starting Value	max	Tool Diameter (mm)	16,0	20,0	25,0	32,0	40,0
P	1	110	**140**	170	mm/r	0,17–0,25	0,19–0,29	0,23–0,38	0,26–0,43	0,33–0,76
	2	100	**120**	140	mm/r	0,19–0,25	0,22–0,29	0,29–0,38	0,32–0,43	0,33–0,76
	3	80	**100**	120	mm/r	0,15–0,23	0,17–0,25	0,23–0,34	0,26–0,38	0,33–0,66
	4	70	**90**	110	mm/r	0,13–0,23	0,14–0,25	0,18–0,34	0,21–0,38	0,26–0,66
M	1	40	**60**	80	mm/r	0,11–0,17	0,13–0,20	0,16–0,25	0,18–0,28	0,21–0,31
	2	35	**55**	70	mm/r	0,11–0,17	0,13–0,20	0,16–0,25	0,18–0,28	0,21–0,31
	3	20	**40**	60	mm/r	0,11–0,17	0,13–0,20	0,16–0,25	0,18–0,28	0,21–0,31
K	1	90	**135**	175	mm/r	0,19–0,25	0,22–0,29	0,29–0,38	0,32–0,43	0,33–0,76
	2	80	**120**	140	mm/r	0,19–0,25	0,22–0,29	0,29–0,38	0,32–0,43	0,33–0,76
	3	70	**110**	125	mm/r	0,18–0,26	0,21–0,29	0,23–0,37	0,25–0,42	0,27–0,57
S	1	20	**40**	60	mm/r	0,11–0,17	0,13–0,20	0,16–0,25	0,18–0,28	0,21–0,31
	3	15	**30**	45	mm/r	0,11–0,17	0,13–0,20	0,16–0,25	0,18–0,28	0,21–0,31

NOTE: Through coolant recommended for greater than 3 x D applications.
Material group M is recommended for secondary applications.

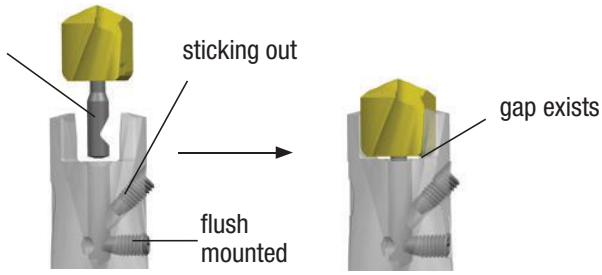
Application Data • MS • WM15PD™ • Metric

Material Group		Cutting Speed — Vc Range — m/min			Recommended Feed Rate (f) by Diameter					
		min	Starting Value	max	Tool Diameter (mm)	16,0	20,0	25,4	32,0	40,0
M	1	40	**80**	110	mm/r	0,11 – 0,26	0,13 – 0,28	0,13 – 0,32	0,14 – 0,35	0,15 – 0,37
	2	35	**55**	75	mm/r	0,11 – 0,26	0,13 – 0,28	0,13 – 0,32	0,14 – 0,35	0,15 – 0,37
	3	20	**35**	50	mm/r	0,11 – 0,26	0,13 – 0,28	0,13 – 0,32	0,14 – 0,35	0,15 – 0,37
K	1	90	**135**	175	mm/r	0,19 – 0,25	0,22 – 0,29	0,29 – 0,38	0,32 – 0,43	0,33 – 0,50
	2	80	**120**	140	mm/r	0,19 – 0,25	0,22 – 0,29	0,29 – 0,38	0,32 – 0,43	0,33 – 0,50
	3	70	**110**	125	mm/r	0,18 – 0,26	0,21 – 0,29	0,23 – 0,37	0,25 – 0,42	0,27 – 0,46
N	1	90	**155**	220	mm/r	0,25 – 0,50	0,28 – 0,56	0,32 – 0,63	0,32 – 0,70	0,32 – 0,70
	2	90	**155**	220	mm/r	0,25 – 0,50	0,28 – 0,56	0,32 – 0,63	0,32 – 0,70	0,32 – 0,70
	3	80	**120**	160	mm/r	0,25 – 0,50	0,28 – 0,56	0,32 – 0,63	0,32 – 0,70	0,32 – 0,70
	4	90	**155**	220	mm/r	0,25 – 0,50	0,28 – 0,56	0,32 – 0,63	0,32 – 0,70	0,32 – 0,70
	5	160	**200**	240	mm/r	0,25 – 0,50	0,28 – 0,56	0,32 – 0,63	0,32 – 0,70	0,32 – 0,70
	6	160	**200**	240	mm/r	0,25 – 0,50	0,28 – 0,56	0,32 – 0,63	0,32 – 0,70	0,32 – 0,70
S	1	20	**40**	60	mm/r	0,07 – 0,12	0,09 – 0,14	0,11 – 0,17	0,13 – 0,20	0,16 – 0,25
	2	15	**30**	45	mm/r	0,07 – 0,12	0,09 – 0,14	0,11 – 0,17	0,13 – 0,20	0,16 – 0,25
	3	15	**30**	45	mm/r	0,07 – 0,12	0,09 – 0,14	0,11 – 0,17	0,13 – 0,20	0,16 – 0,25
	4	10	**25**	40	mm/r	0,07 – 0,12	0,13 – 0,20	0,16 – 0,25	0,18 – 0,28	0,21 – 0,31

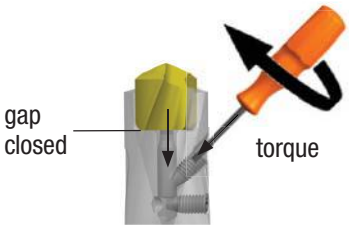
Assembling and Disassembling Instructions

Assembly

1 Insert positioning



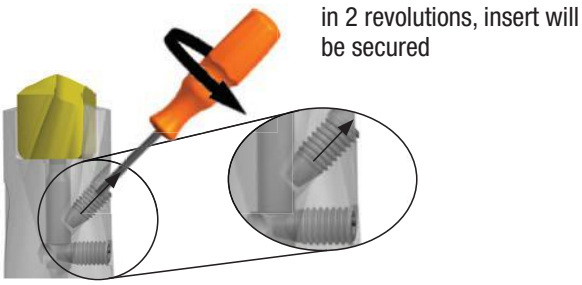
2 Insert clamping



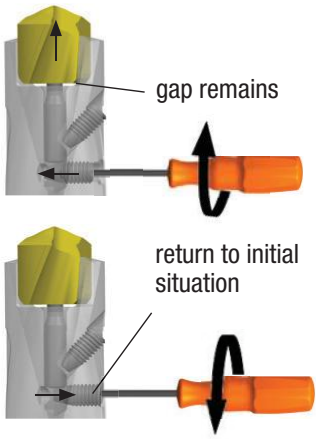
Drill diameter	Torque
ø 16–19,999mm	1,5 Nm
ø 20–23,999mm	2,1 Nm
ø 24–27,999mm	3,0 Nm
ø 28–40,000mm	4,5 Nm

Disassembly

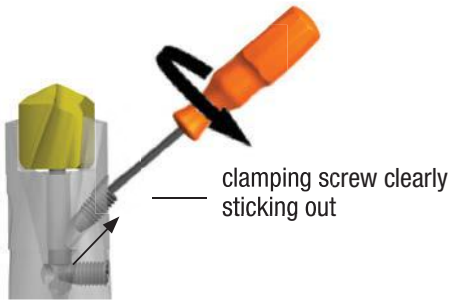
1 Clamping screw loosening



2 Insert pushing out



3 Further clamping screw loosening



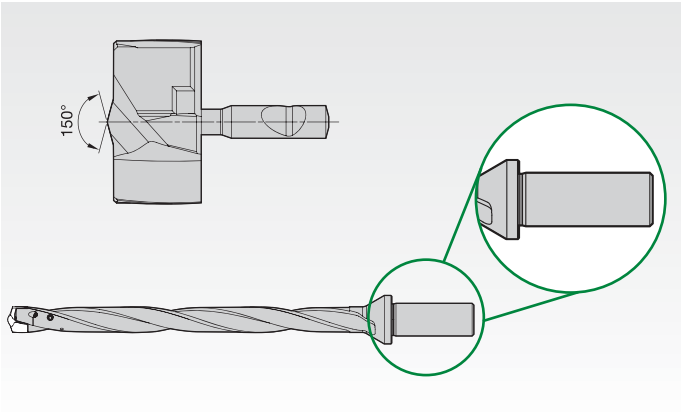
4 Insert removal

Application Guidelines

Deep-Hole Drilling from 12 x D

- Use the FPE(M) geometry in combination with the 1.5 x D body for pilot hole.
- The point angle of spot drill should be greater than point angle of the insert (>140º).
- The 150º point on the FPE(M) insert is perfect as spot for the regular 140º insert.

- The 12 x D body has a cylindrical straight shank with flange.
- Shank tolerance h6.
- Best used in combination with a hydraulic chuck to minimize the runout.



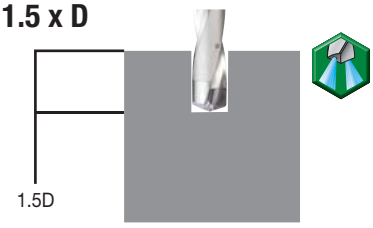
FPE

PK

MS

1

1.5 x D

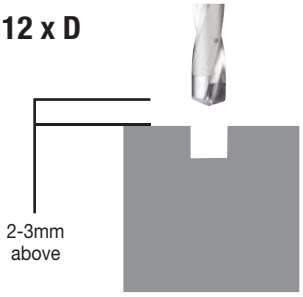


Step 1

Use 1.5 x D FPE geometry drill to create a guide hole with thru coolant and ensure no chips are stuck in the hole.

2

12 x D

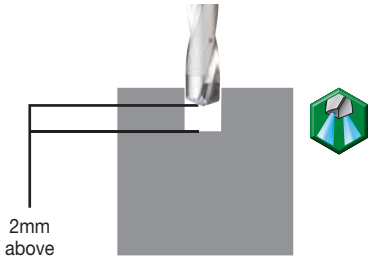


Step 2

Use 12 x D PK, MS geometry drill for deep hole.

- Spindle RPM 500 max (If horizontal machine spindle direction CCW) and 2~3 above the work piece rapid traverse.
- Feed in recommended feed rate and position 2,0mm above the pilot hole depth.

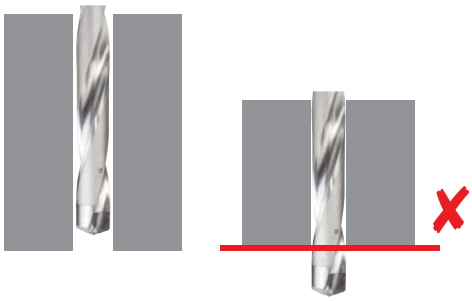
3



Step 3

- Switch on the through coolant and ensure coolant flow and spindle rotation CW, recommended spindle RPM.

4

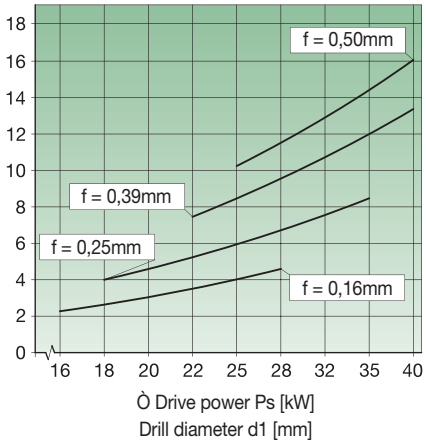


Step 4

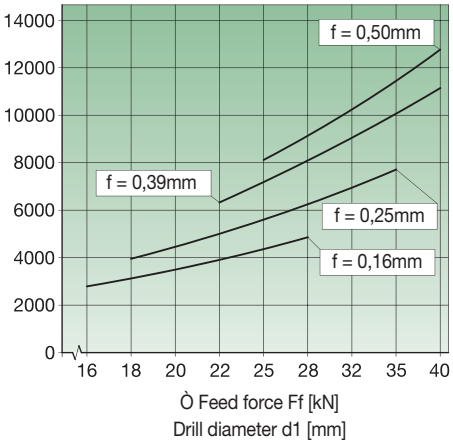
- Feed in for the entire depth with recommended cutting parameters (feed reduction 25% near exit).
- Ensure the carbide head does not come out of the hole if through.
- For best surface finish Vf, 2,0 to 3,0mm per min is recommended during retraction.

TDMX™ Application Notes • Power and Coolant Requirements

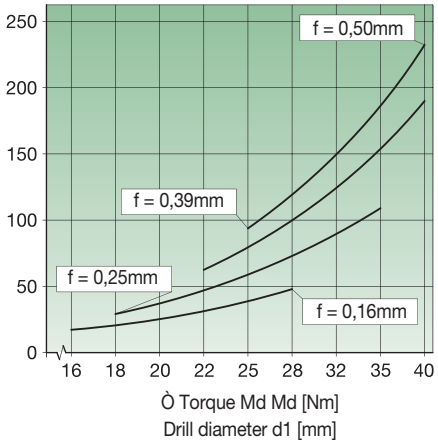
Drive Power (kW)



Feed Force (kN)



Torque (Nm)



NOTE: The diagrams above are used to determine the drive power, feed force, and torque. They are based on cutting force measurement in tempered steels in Cgr. 6. Tensile strength: Rm = 600 N/mm2. The base cutting speed used is: vc = 80 m/min.

TDMX • Regrinding Length • FPE • Metric

SSC	diameter range D	L min.	L new
A	16–16,999	9,8	10,8
B	17–17,999	9,8	10,8
C	18–18,999	10,6	11,7
D	19–19,999	10,6	11,7
E	20–20,999	11,4	12,6
F	21–21,999	11,4	12,6
G	22–22,999	12,1	13,4
H	23–23,999	12,1	13,4
I	24–24,999	13,0	14,4
J	25–25,999	13,0	14,4
K	26–26,999	13,8	15,3
L	27–27,999	13,8	15,3
M	28–28,999	14,8	16,4
N	29–29,999	14,8	16,4
O	30–30,999	15,6	17,3
P	31–31,999	15,6	17,3
Q	32–33,999	17,8	19,7
R	34–35,999	17,8	19,7
S	36–37,999	19,4	21,5
T	38–40,000	19,4	21,5

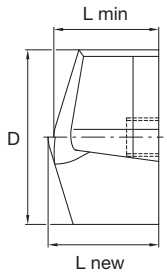
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

TDMX • Regrinding Length • PK, MS • Metric

SSC	diameter range D	L min.	L new
A	16–16,999	11,2	12,5
B	17–17,999	11,2	12,5
C	18–18,999	12,2	13,6
D	19–19,999	12,2	13,6
E	20–20,999	13,2	14,7
F	21–21,999	13,2	14,7
G	22–22,999	14,2	15,8
H	23–23,999	14,2	15,8
I	24–24,999	15,2	16,9
J	25–25,999	15,2	16,9
K	26–26,999	16,2	18
L	27–27,999	16,2	18
M	28–28,999	17,2	19,1
N	29–29,999	17,2	19,1
O	30–30,999	18,2	20,2
P	31–31,999	18,2	20,2
Q	32–33,999	20,1	22,3
R	34–35,999	20,1	22,3
S	36–37,999	22,1	24,5
T	38–40,000	22,1	24,5

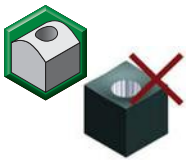
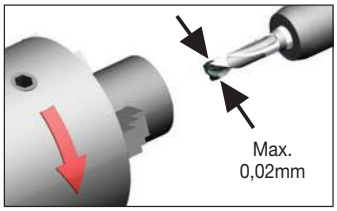
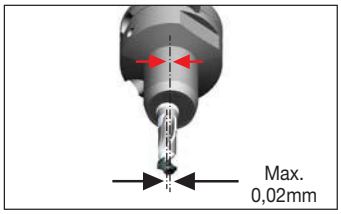
The following coolant pressure is recommended:

relative drilling depth	coolant pressure
1–3 x D	8 bars
5 x D	12 bars
7 x D	20 bars
10 x D	30 bars
12 x D	30 bars



TDMX™ Application Guidelines

Up to 1D | Recommended | Recommended | Dry not recommended

Application Recommendation	Work Piece Shape	Remarks
Flat Face Recommended		1,5 x D, 3 x D and 5 x D: No Feed Reduction 8 x D: No Feed Reduction; Optional 25% Reduction 12 x D: 25% entry and exit Reduction
Stacked Plates Recommended		Minimize as much as possible the space between the two plates. The FPE geometry is a problem-solver in this situation.
Inclined Entry Recommended		**1,5 x D, 3 x D, and 5 x D** INCLINATION / FEED RATE 1° / 90% 2° / 75% 3° / 50% >3° / Pilot Drilling or Pre-Machining **8 x D and 12 x D** Pilot drilling or pre-machining on all surfaces recommended
Inclined Exit Recommended		**1,5 x D, 3 x D, and 5 x D** INCLINATION / FEED RATE 5° / 100% >5° / 75%–50% >20°Cast Iron / 50% >20°Steel / Not Recommended **8 x D and 12 x D** FEED RATE 75% 75%–50% 50% Not Recommended
Cross Holes Recommended		Cross hole out of center and center edge in contact — Recommended Cross hole on center and < drill diameter — Recommended Cross hole on center and > drill diameter — Exercise Caution Cross hole on center and = drill diameter — Exercise Caution Cross hole out of center and center edge not in contact — Not Recommended
Convex / Concave Surface		Always pre-machine the surface
Half Cylindrical Not Recommended		**Usage Precautions** **Core Deviation** 1) For Turning Machines  Set deviation amount under 0,02mm between workpiece and drill. 2) For Machining Centers  Do not use any arbor with a damaged attachment surface. Center of arbor deviation must be within 0,02mm.
Hole Expansion Not Recommended		
Pipe Material Not Recommended		
Cored hole Not Recommended		

widia.com

WIDIA™

TOP DRILL M1™

Universal Modular Drilling • TDM1

The TDM1 modular drill is for customers seeking an easy-to-use system capable of operating on a variety of materials with one single point geometry, and a tool body featuring a quick-change, front-clamping mechanism.

140° cone point geometry
Low thrust with excellent centering capabilities

Front-locking system
Easy to change and apply

Differential flute design
Good stability and easy evacuation of chips

Sub-micron grain substrate
Longer life and superior resistance against drill breakage

The TDM1 modular drill is designed with a front-locking mechanism, point geometry UP, and wear-resistant PVD coating for consistent hole quality.

WU25PD

P M K

Sub-micron grain carbide
TiAlN multilayer for steel, stainless steel, and cast iron

MODULAR VERSATILITY

PRODUCT

TDM1 is a front clamping drill with universal point geometry and grade suited for PMK materials.

DIAMETER RANGE

8–25,99mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

FIRST CHOICE

P K

SECOND CHOICE

M

APPLICATIONS

DRILLING

THROUGH COOLANT

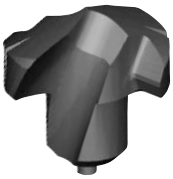
2 FLUTE/2 MARGIN/ COOLANT

STEEL BODIES

SERIES	COOLANT	LENGTH RATIO	DIAMETER RANGE
TDM1	Through Coolant	3 x D	7,94–25,99mm
TDM1	Through Coolant	5 x D	7,94–25,99mm
TDM1	Through Coolant	8 x D	7,94–25,99mm

Shank Style

SCF shank for metric tools



TDM1 Inserts • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

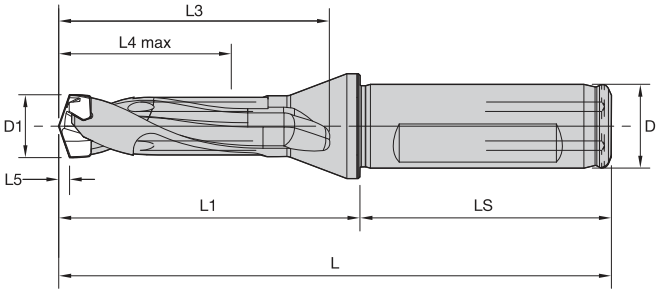
TDM	2599	UPM	WU25PD
Top Drill Modular	Insert Diameter	Insert Geometry	Grade
	25,99mm	**PK** = steel and cast iron	**W**IDIA™; **U**niversal, Application **25** = wear resistant carbide, **P**VD coated, Modular **D**rill Insert

TDM1 Bodies • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

TDM	250	R8	SCF	25M
Top Drill Modular	Drill Body Diameter	L/D Ratio	Shank Style	Shank Diameter
	25mm	8 x D	Flanged shanks with flat SCF	25mm

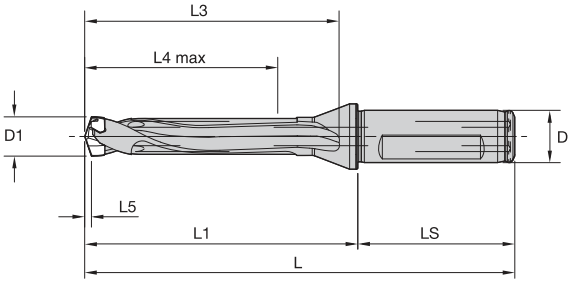
TOP DRILL M1™ • 3 x D • Flanged Shank • Metric



order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	SSC
3850904	TDM080R3SCF12M	7,94	8,49	12	86	41	35	26	1,5	45	W10
3850906	TDM085R3SCF12M	8,50	8,99	12	88	43	37	27	1,6	45	W11
3850908	TDM090R3SCF12M	9,00	9,49	12	90	45	39	29	1,7	45	W12
3850910	TDM095R3SCF12M	9,50	9,99	12	92	47	41	30	1,8	45	W13
3850912	TDM100R3SCF16M	10,00	10,49	16	97	49	43	32	1,9	48	W14
3850924	TDM105R3SCF16M	10,50	10,99	16	99	51	45	33	2,0	48	W15
3850926	TDM110R3SCF16M	11,00	11,49	16	101	53	47	35	2,1	48	W16
3850928	TDM115R3SCF16M	11,50	11,99	16	103	55	49	36	2,2	48	W17
3850930	TDM120R3SCF16M	12,00	12,49	16	106	58	52	38	2,3	48	W18
3850932	TDM125R3SCF16M	12,50	12,99	16	108	60	54	39	2,4	48	W19
3850934	TDM130R3SCF16M	13,00	13,49	16	110	62	56	41	2,5	48	W20
3850936	TDM135R3SCF16M	13,50	13,99	16	112	64	58	42	2,6	48	W21
3850938	TDM140R3SCF16M	14,00	14,49	16	114	66	60	44	2,7	48	W22
3850940	TDM145R3SCF16M	14,50	14,99	16	116	68	62	45	2,8	48	W23
3850942	TDM150R3SCF20M	15,00	15,99	20	122	72	66	48	2,8	50	W24
3850944	TDM160R3SCF20M	16,00	16,99	20	126	76	70	51	3,0	50	W25
3850946	TDM170R3SCF20M	17,00	17,99	20	131	81	75	54	3,2	50	W26
3850948	TDM180R3SCF25M	18,00	18,99	25	141	85	79	57	3,4	56	W27
3850950	TDM190R3SCF25M	19,00	19,99	25	144	89	83	60	3,6	56	W28
3850952	TDM200R3SCF25M	20,00	20,99	25	149	93	87	63	3,8	56	W29
3992070	TDM210R3SCF25M	21,00	21,99	25	153	97	91	66	3,7	56	W30
3992071	TDM220R3SCF25M	22,00	22,99	25	158	102	96	69	3,9	56	W31
3992072	TDM230R3SCF25M	23,00	23,99	25	162	106	100	72	4,1	56	W32
3992483	TDM240R3SCF25M	24,00	24,99	25	166	110	104	75	4,2	56	W33
3992484	TDM250R3SCF25M	25,00	25,99	25	170	114	108	78	4,4	56	W34

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

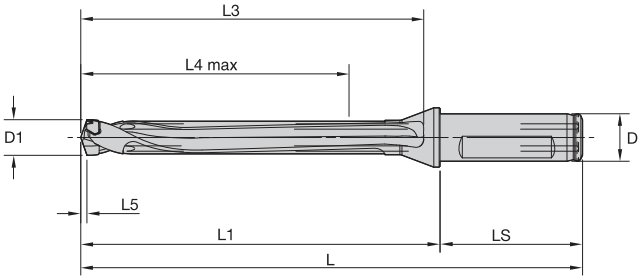
TOP DRILL M1™ • 5 x D • Flanged Shank • Metric



order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	SSC
3850905	TDM080R5SCF12M	7,94	8,49	12	104	59	53	43	1,5	45	W10
3850907	TDM085R5SCF12M	8,50	8,99	12	107	62	56	45	1,6	45	W11
3850909	TDM090R5SCF12M	9,00	9,49	12	110	65	59	48	1,7	45	W12
3850911	TDM095R5SCF12M	9,50	9,99	12	114	69	63	50	1,8	45	W13
3850923	TDM100R5SCF16M	10,00	10,49	16	120	72	66	53	1,9	48	W14
3850925	TDM105R5SCF16M	10,50	10,99	16	123	75	69	55	2,0	48	W15
3850927	TDM110R5SCF16M	11,00	11,49	16	126	78	72	58	2,1	48	W16
3850929	TDM115R5SCF16M	11,50	11,99	16	129	81	75	60	2,2	48	W17
3850931	TDM120R5SCF16M	12,00	12,49	16	132	84	78	63	2,3	48	W18
3850933	TDM125R5SCF16M	12,50	12,99	16	135	87	81	65	2,4	48	W19
3850935	TDM130R5SCF16M	13,00	13,49	16	138	90	84	68	2,5	48	W20
3850937	TDM135R5SCF16M	13,50	13,99	16	142	94	88	70	2,6	48	W21
3850939	TDM140R5SCF16M	14,00	14,49	16	145	97	91	73	2,7	48	W22
3850941	TDM145R5SCF16M	14,50	14,99	16	148	100	94	75	2,8	48	W23
3850943	TDM150R5SCF20M	15,00	15,99	20	156	106	100	80	2,8	50	W24
3850945	TDM160R5SCF20M	16,00	16,99	20	162	112	106	85	3,0	50	W25
3850947	TDM170R5SCF20M	17,00	17,99	20	169	119	113	90	3,2	50	W26
3850949	TDM180R5SCF25M	18,00	18,99	25	181	125	119	95	3,4	56	W27
3850951	TDM190R5SCF25M	19,00	19,99	25	187	131	125	100	3,6	56	W28
3850953	TDM200R5SCF25M	20,00	20,99	25	193	137	131	105	3,8	56	W29
3992485	TDM210R5SCF25M	21,00	21,99	25	200	144	138	110	3,7	56	W30
3992486	TDM220R5SCF25M	22,00	22,99	25	206	150	144	115	3,9	56	W31
3992487	TDM230R5SCF25M	23,00	23,99	25	212	156	150	120	4,1	56	W32
3992488	TDM240R5SCF25M	24,00	24,99	25	218	162	156	125	4,2	56	W33
3992489	TDM250R5SCF25M	25,00	25,99	25	225	169	163	130	4,4	56	W34

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

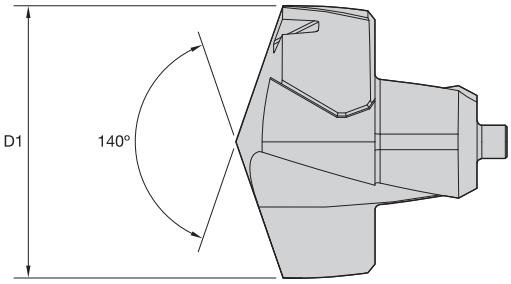
TOP DRILL M1™ • 8 x D • Flanged Shank • Metric



order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	SSC
3992141	TDM080R8SCF12M	7,94	8,49	12	129	84	79	68	1,4	45	W10
3992142	TDM085R8SCF12M	8,50	8,99	12	134	89	83	72	1,5	45	W11
3992213	TDM090R8SCF12M	9,00	9,49	12	138	93	88	76	1,6	45	W12
3992214	TDM095R8SCF12M	9,50	9,99	12	144	99	93	80	1,7	45	W13
3992215	TDM100R8SCF16M	10,00	10,49	16	151	103	98	84	1,8	48	W14
3992216	TDM105R8SCF16M	10,50	10,99	16	156	108	102	88	1,9	48	W15
3992217	TDM110R8SCF16M	11,00	11,49	16	160	112	107	92	2,0	48	W16
3992218	TDM115R8SCF16M	11,50	11,99	16	165	117	111	96	2,1	48	W17
3992219	TDM120R8SCF16M	12,00	12,49	16	169	121	116	100	2,1	48	W18
3992220	TDM125R8SCF16M	12,50	12,99	16	174	126	120	104	2,2	48	W19
3992221	TDM130R8SCF16M	13,00	13,49	16	178	130	125	108	2,3	48	W20
3992222	TDM135R8SCF16M	13,50	13,99	16	184	136	130	112	2,4	48	W21
3992223	TDM140R8SCF16M	14,00	14,49	16	188	140	135	116	2,5	48	W22
3992224	TDM145R8SCF16M	14,50	14,99	16	193	145	139	120	2,6	48	W23
3992225	TDM150R8SCF20M	15,00	15,99	20	204	154	148	128	2,7	50	W24
3992226	TDM160R8SCF20M	16,00	16,99	20	213	163	157	136	2,8	50	W25
3992227	TDM170R8SCF20M	17,00	17,99	20	223	173	167	144	3,0	50	W26
3992228	TDM180R8SCF25M	18,00	18,99	25	238	182	176	152	2,9	56	W27
3992229	TDM190R8SCF25M	19,00	19,99	25	247	191	185	160	3,4	56	W28
3992230	TDM200R8SCF25M	20,00	20,99	25	256	200	194	168	3,6	56	W29
3992231	TDM210R8SCF25M	21,00	21,99	25	266	210	204	176	3,7	56	W30
3992232	TDM220R8SCF25M	22,00	22,99	25	275	219	213	184	3,9	56	W31
3992233	TDM230R8SCF25M	23,00	23,99	25	284	228	222	192	4,1	56	W32
3992234	TDM240R8SCF25M	24,00	24,99	25	293	237	231	200	4,2	56	W33
3992235	TDM250R8SCF25M	25,00	25,99	25	303	247	241	208	4,4	56	W34

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

TOP DRILL M1™ • Inserts • UP



P	●
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● first choice
○ alternate choice

grade WU25PD TiAlN			
order #	catalogue #	D1	SSC
3850959	TDM0794UPM	7,94	W10
3848984	TDM0800UPM	8,00	W10
3848985	TDM0810UPM	8,10	W10
3850960	TDM0816UPM	8,16	W10
3850961	TDM0820UPM	8,20	W10
3848986	TDM0830UPM	8,30	W10
3850962	TDM0833UPM	8,33	W10
3848987	TDM0840UPM	8,40	W10
3850963	TDM0843UPM	8,43	W10
3848988	TDM0850UPM	8,50	W11
3848989	TDM0860UPM	8,60	W11
3850964	TDM0861UPM	8,61	W11
3848990	TDM0870UPM	8,70	W11
3850965	TDM0873UPM	8,73	W11
3848991	TDM0880UPM	8,80	W11
3850966	TDM0884UPM	8,84	W11
3848992	TDM0890UPM	8,90	W11
3849043	TDM0900UPM	9,00	W12
3850967	TDM0909UPM	9,09	W12
3849044	TDM0910UPM	9,10	W12
3850968	TDM0913UPM	9,13	W12
3849045	TDM0920UPM	9,20	W12
3849046	TDM0930UPM	9,30	W12
3850969	TDM0935UPM	9,35	W12
3849047	TDM0940UPM	9,40	W12
3849048	TDM0950UPM	9,50	W13
3850970	TDM0953UPM	9,53	W13
3850971	TDM0956UPM	9,56	W13
3850972	TDM0958UPM	9,58	W13
3849049	TDM0960UPM	9,60	W13
3850973	TDM0970UPM	9,70	W13
3850974	TDM0980UPM	9,80	W13
3849050	TDM0990UPM	9,90	W13
3850975	TDM0992UPM	9,92	W13
3849051	TDM1000UPM	10,00	W14
3850976	TDM1002UPM	10,02	W14
3850977	TDM1008UPM	10,08	W14
3849052	TDM1010UPM	10,10	W14
3849053	TDM1020UPM	10,20	W14
3850978	TDM1026UPM	10,26	W14
3849054	TDM1030UPM	10,30	W14
3850979	TDM1032UPM	10,32	W14
3849055	TDM1040UPM	10,40	W14
3850980	TDM1049UPM	10,49	W14
3849056	TDM1050UPM	10,50	W15
3849057	TDM1060UPM	10,60	W15
3849058	TDM1070UPM	10,70	W15
3850981	TDM1072UPM	10,72	W15
3849059	TDM1080UPM	10,80	W15
3849060	TDM1090UPM	10,90	W15
3849061	TDM1100UPM	11,00	W16
3849062	TDM1110UPM	11,10	W16

TOP DRILL M1™ • Inserts • UP

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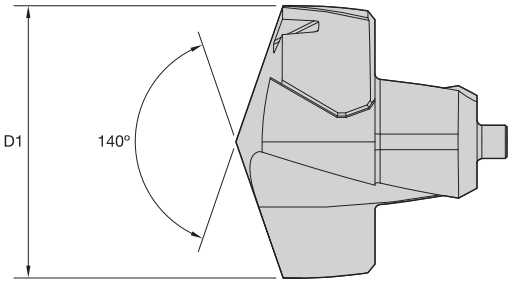

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● first choice
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grade WU25PD TiAlN			
order #	catalogue #	D1	SSC
3850982	TDM1111UPM	11,11	W16
3849063	TDM1120UPM	11,20	W16
3849064	TDM1130UPM	11,30	W16
3849065	TDM1140UPM	11,40	W16
3849066	TDM1150UPM	11,50	W17
3850983	TDM1151UPM	11,51	W17
3849067	TDM1160UPM	11,60	W17
3850984	TDM1161UPM	11,61	W17
3849068	TDM1170UPM	11,70	W17
3849069	TDM1180UPM	11,80	W17
3849070	TDM1190UPM	11,90	W17
3850985	TDM1191UPM	11,91	W17
3849071	TDM1200UPM	12,00	W18
3849072	TDM1210UPM	12,10	W18
3849073	TDM1220UPM	12,20	W18
3850986	TDM1230UPM	12,30	W18
3849074	TDM1240UPM	12,40	W18
3850987	TDM1247UPM	12,47	W18
3849075	TDM1250UPM	12,50	W19
3849076	TDM1260UPM	12,60	W19
3850988	TDM1270UPM	12,70	W19
3849077	TDM1280UPM	12,80	W19
3850989	TDM1290UPM	12,90	W19
3849078	TDM1300UPM	13,00	W20
3850990	TDM1310UPM	13,10	W20
3849079	TDM1320UPM	13,20	W20
3849080	TDM1330UPM	13,30	W20
3849081	TDM1340UPM	13,40	W20
3850991	TDM1349UPM	13,49	W20
3849082	TDM1350UPM	13,50	W21
3849083	TDM1360UPM	13,60	W21
3849084	TDM1370UPM	13,70	W21
3849085	TDM1380UPM	13,80	W21
3850992	TDM1389UPM	13,89	W21
3850993	TDM1390UPM	13,90	W21
3849086	TDM1400UPM	14,00	W22
3849087	TDM1410UPM	14,10	W22
3849088	TDM1420UPM	14,20	W22
3850994	TDM1429UPM	14,29	W22
3849089	TDM1430UPM	14,30	W22
3849090	TDM1440UPM	14,40	W22
3849091	TDM1450UPM	14,50	W23
3849092	TDM1460UPM	14,60	W23
3850995	TDM1467UPM	14,67	W23
3850996	TDM1468UPM	14,68	W23
3849093	TDM1470UPM	14,70	W23
3849094	TDM1480UPM	14,80	W23
3849095	TDM1490UPM	14,90	W23
3849096	TDM1500UPM	15,00	W24
3850997	TDM1508UPM	15,08	W24
3849097	TDM1510UPM	15,10	W24
3849098	TDM1520UPM	15,20	W24

TOP DRILL M1™ • Inserts • UP

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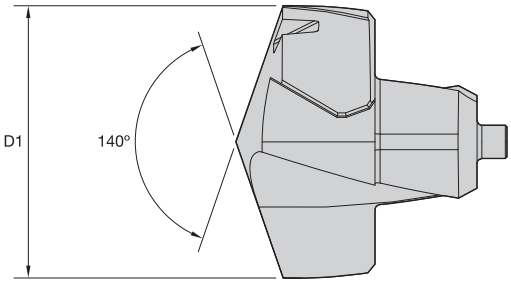

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● first choice
○ alternate choice

grade WU25PD TiAlN			
order #	catalogue #	D1	SSC
3849099	TDM1530UPM	15,30	W24
3849100	TDM1540UPM	15,40	W24
3850998	TDM1548UPM	15,48	W24
3849101	TDM1550UPM	15,50	W24
3849102	TDM1560UPM	15,60	W24
3849103	TDM1570UPM	15,70	W24
3849104	TDM1580UPM	15,80	W24
3850999	TDM1588UPM	15,88	W24
3849105	TDM1600UPM	16,00	W25
3851000	TDM1603UPM	16,03	W25
3851001	TDM1608UPM	16,08	W25
3849106	TDM1610UPM	16,10	W25
4010625	TDM1618UPM	16,18	W25
3849107	TDM1620UPM	16,20	W25
3851002	TDM1627UPM	16,27	W25
3849108	TDM1630UPM	16,30	W25
3849109	TDM1640UPM	16,40	W25
3849110	TDM1650UPM	16,50	W25
3849111	TDM1660UPM	16,60	W25
3851003	TDM1667UPM	16,67	W25
3849112	TDM1670UPM	16,70	W25
3849113	TDM1680UPM	16,80	W25
3851004	TDM1687UPM	16,87	W25
3849114	TDM1690UPM	16,90	W25
3849119	TDM1700UPM	17,00	W26
3851005	TDM1707UPM	17,07	W26
3849120	TDM1710UPM	17,10	W26
3849121	TDM1720UPM	17,20	W26
3849122	TDM1730UPM	17,30	W26
3849193	TDM1740UPM	17,40	W26
3851006	TDM1746UPM	17,46	W26
3849194	TDM1750UPM	17,50	W26
3849195	TDM1760UPM	17,60	W26
3849196	TDM1770UPM	17,70	W26
3849197	TDM1780UPM	17,80	W26
3851007	TDM1786UPM	17,86	W26
3849198	TDM1790UPM	17,90	W26
3849199	TDM1800UPM	18,00	W27
3849200	TDM1810UPM	18,10	W27
3849201	TDM1820UPM	18,20	W27
3851008	TDM1826UPM	18,26	W27
3849202	TDM1830UPM	18,30	W27
3849203	TDM1840UPM	18,40	W27
3849204	TDM1850UPM	18,50	W27
3849205	TDM1860UPM	18,60	W27
3851009	TDM1865UPM	18,65	W27
3849206	TDM1870UPM	18,70	W27
3849207	TDM1880UPM	18,80	W27
3849208	TDM1890UPM	18,90	W27
3849209	TDM1900UPM	19,00	W28
3851010	TDM1905UPM	19,05	W28
3849210	TDM1910UPM	19,10	W28

TOP DRILL M1™ • Inserts • UP

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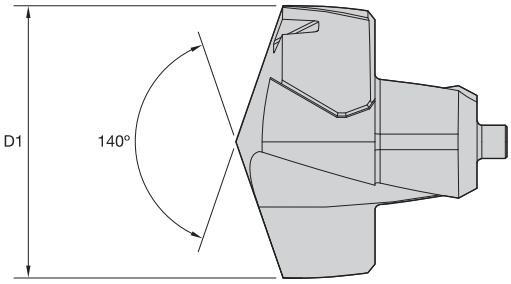

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● first choice
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grade WU25PD TiAlN			
order #	catalogue #	D1	SSC
3849211	TDM1920UPM	19,20	W28
3851011	TDM1923UPM	19,23	W28
3851012	TDM1925UPM	19,25	W28
3851013	TDM1928UPM	19,28	W28
3849212	TDM1930UPM	19,30	W28
3851014	TDM1935UPM	19,35	W28
3849213	TDM1940UPM	19,40	W28
3851015	TDM1945UPM	19,45	W28
3849214	TDM1950UPM	19,50	W28
3849215	TDM1960UPM	19,60	W28
3849216	TDM1970UPM	19,70	W28
3849217	TDM1980UPM	19,80	W28
3851016	TDM1984UPM	19,84	W28
3849218	TDM1990UPM	19,90	W28
3849219	TDM2000UPM	20,00	W29
3849220	TDM2010UPM	20,10	W29
3849221	TDM2020UPM	20,20	W29
3851017	TDM2024UPM	20,24	W29
3849222	TDM2030UPM	20,30	W29
3849223	TDM2040UPM	20,40	W29
3849224	TDM2050UPM	20,50	W29
3849225	TDM2060UPM	20,60	W29
3851018	TDM2064UPM	20,64	W29
3849226	TDM2070UPM	20,70	W29
3849227	TDM2080UPM	20,80	W29
3849228	TDM2090UPM	20,90	W29
3849229	TDM2099UPM	20,99	W29
4003225	TDM2100UPM	21,00	W30
4003203	TDM2144UPM	21,44	W30
3969291	TDM2150UPM	21,50	W30
4003226	TDM2200UPM	22,00	W31
4003204	TDM2223UPM	22,23	W31
4003205	TDM2245UPM	22,45	W31
4003227	TDM2250UPM	22,50	W31
4003228	TDM2300UPM	23,00	W32
4003229	TDM2350UPM	23,50	W32
4003206	TDM2381UPM	23,81	W32
4003230	TDM2400UPM	24,00	W33
4003231	TDM2450UPM	24,50	W33
4003207	TDM2461UPM	24,61	W33
4003232	TDM2500UPM	25,00	W34
4003208	TDM2540UPM	25,40	W34
4002444	TDM2550UPM	25,50	W34
4003209	TDM2568UPM	25,68	W34
4003210	TDM2581UPM	25,81	W34
3992013	TDM2599UPM	25,99	W34

Application Data • UP • WU25PD™ • Metric

Material Group		Cutting Speed — vc Range — m/min min	Starting Value	max	Tool Diameter (mm)	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P	1	90	**125**	170	mm/r	0,11–0,20	0,13–0,25	0,14–0,31	0,17–0,39	0,19–0,45	0,25–0,48	0,30–0,52
	2	105	**140**	180	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,21–0,46	0,23–0,46	0,28–0,50	0,30–0,52
	3	50	**75**	100	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,21–0,46	0,23–0,46	0,28–0,50	0,30–0,52
	4	50	**75**	100	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,17–0,36	0,19–0,45	0,22–0,48	0,25–0,50
	5	50	**65**	80	mm/r	0,10–0,20	0,10–0,23	0,10–0,25	0,14–0,29	0,16–0,32	0,18–0,36	0,22–0,42
	6	50	**65**	80	mm/r	0,10–0,20	0,10–0,23	0,10–0,25	0,14–0,29	0,16–0,32	0,18–0,36	0,22–0,42
M	1	40	**80**	110	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
	2	35	**55**	75	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
	3	20	**35**	50	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
K	1	60	**95**	170	mm/r	0,15–0,29	0,16–0,32	0,17–0,35	0,21–0,42	0,25–0,48	0,28–0,52	0,32–0,56
	2	60	**75**	90	mm/r	0,15–0,29	0,16–0,30	0,17–0,33	0,21–0,41	0,25–0,48	0,28–0,52	0,32–0,56
	3	40	**65**	90	mm/r	0,16–0,30	0,17–0,33	0,18–0,36	0,20–0,41	0,21–0,44	0,23–0,48	0,25–0,50

NOTE: Through coolant recommended for greater than 3 x D applications.

Application Data • Victory™ TOP DRILL M1™

How to attach inserts

1) Fix drill holder on arbor. For insert exchange, fix arbor on the machine or set on tool presetter.

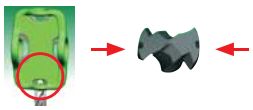
2) Remove dust using air blast.

3) Put insert into drill holder. (Use gloves to protect your hands.)

4) Turn lightly in a clockwise direction. (Use gloves to protect your hands.)

5) Set the wrench properly.*

6) Make sure the wrench fits with the insert slot for the wrench. (Is the wrench unfixed from the slot?)



7) Slowly turn the wrench in a clockwise direction.

8) Complete.

How to detach inserts

1) Remove dust from insert using air blast.

2) Set the wrench properly.*

3) Fit the wrench to insert slot.

4) Turn the wrench in a counterclockwise direction.

5) Once lock is released, insert can be turned with fingers. (Use gloves to protect your hands.)

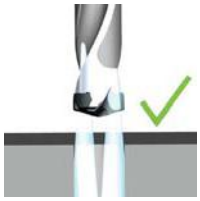
6) Remove insert. (Use gloves to protect your hands.)

**To order the TDM1 Wrench, please use order number 3861623 and catalog number 170.315.*

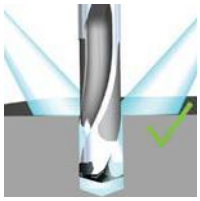
Application Data • Victory™ TOP DRILL M1™

Cautions

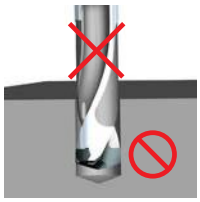
Coolant



1) Internal coolant is recommended.



2) In case of external coolant, cutting depth must be 3 x D or less.

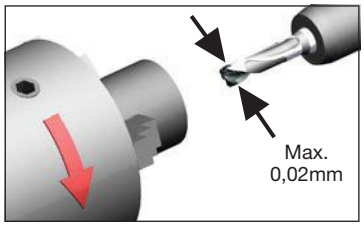


3) Dry cutting is not recommended. Limited applicability in cast iron materials, MQL strongly recommended.

Usage Precautions

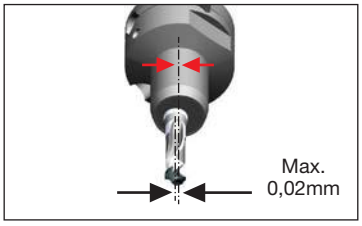
Core deviation

1) For Turning Machines

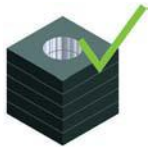


Set deviation amount under 0,02mm between workpiece and drill.

2) For Machining Centers



Do not use any arbor with a damaged attachment surface. Center of arbor deviation must be within 0,02mm.

Application Recommendation	Workpiece Shape
Flat Face **Recommended**	
Stacked Plates **Recommended**	
Inclined Surface >3° **Not Recommended**	
Half Cylindrical **Not Recommended**	
Hole Expansion **Not Recommended**	
Concave Surface **Not Recommended**	
Pipe Material **Not Recommended**	
Cored Hole **Not Recommended**	

widia.com

WIDIA™

Top Cut 4™

Efficient Indexable Drill • TC4

Top Cut 4 indexable drills are equipped with centering capabilities and inboard and outboard inserts delivering outstanding flexibility and versatility in multiple materials.

Large Coolant Holes
Improves coolant in the cutting zone and facilitates easy chip evacuation.

Large Optimized Chip Flutes to enable chip flow and reduce vibrations.

Rigid Cross Section – Sturdy Body
Higher tool life even in tough conditions.

Top Cut 4 indexable drill portfolio encompasses dual four-edged front inserts, instead of traditional drill point geometry, enabling it to perform in a variety of applications on multiple materials.

FOUR CHIP BREAKERS IN FOUR GRADES

-V34

P K

First choice for machining steel, cast iron and short chipping materials. Suitable for severe cutting conditions.

-V36

P M K N

This insert is suitable for situations with low power consumption.

-V38

P M S

First choice for long chipping materials in titanium and stainless steel.

-DU

P M K

First choice for low-powered applications, machining of steel, cast iron, and stainless steel.

FLEXIBLE AND VERSATILE

PRODUCT

Top Cut 4™ is an efficient drill which performs on PMKN materials with true four cutting edges.

DIAMETER RANGE

12–68mm

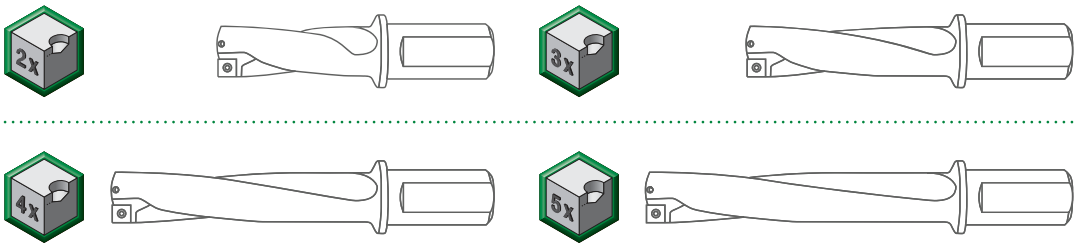
INDUSTRY

MATERIALS

APPLICATIONS

DRILLING | INCLINED ENTRY | INCLINED EXIT | CROSS HOLES | BLIND | HALF-CYLINDRICAL DRILLING | CORNER DRILLING 45° | X-OFFSET | CONVEX | CHAIN DRILLING

STEEL BODIES



INSERTS

GRADES

WN10PH, WPK10CH, WU25CH, WU20PH, WU40PH

FLANGED SLR SHANK

Top Cut 4™ Catalog Numbering System

The guide below provides an example of how to select the
Top Cut 4 tool body and accompanying inserts for a stable steel drilling application.

Metric Body

TCF	250	R	3	SL	32	M	D
Tool Family Top Cut 4	Diameter Metric = 3 digits (e.g. 250 = 25mm) Inch = 4 digits (e.g. 2500 = 2.5")	Right-Hand Cutting	Length Diameter Ratio L/D = 3 x D	Shank Style SL = Side Lock Adapter	Shank Size	Metric	Insert Size

Periphery Insert

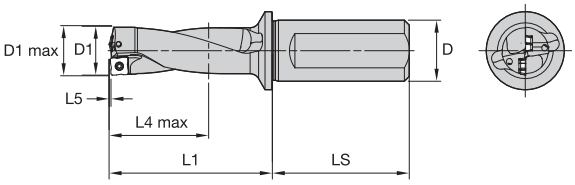
TCF	08	03	08	D	P	V34	WU25CH
Tool Family Top Cut 4	Size In-Circle D1	Insert Thickness	Insert Corner Radius	Insert Size	Insert Positioning C = Central P = Periphery	Insert Geometry	Grade

Insert Geometry – V34 for steel or cast iron or V36 for stainless steel and long chipping steel.

Insert Guide for Grades

W	U	25	C	H
W	U	40	P	H
W	PK	10	C	H
WIDIA™	Material Range U = Universal P = Steel K = Cast Iron	Toughness Range Choose high numbers for toughness in stable conditions, low numbers for high wear resistance at continuous cuts.	Coating P = PVD C = CVD	Application H = Holemaking

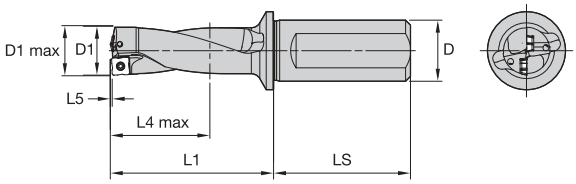
Top Cut 4 • 2 x D • SLR Shanks • Metric



order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5537778	TCF120R2SLR20MA	12,00	12,50	20	43,4	24,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537779	TCF125R2SLR20MA	12,50	13,00	20	44,5	25,5	0,45	50,00	A	TCF040204AP	TCF040203AC
5537860	TCF127R2SLR20MA	12,70	13,20	20	45,9	25,9	0,46	50,00	A	TCF040204AP	TCF040203AC
5537861	TCF130R2SLR20MA	13,00	13,50	20	46,5	26,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5537862	TCF135R2SLR20MA	13,50	14,00	20	48,5	27,5	0,48	50,00	A	TCF040204AP	TCF040203AC
5577828	TCF140R2SLR25MB	14,00	14,50	25	48,5	28,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577829	TCF145R2SLR25MB	14,50	15,00	25	49,5	29,5	0,52	56,00	B	TCF050204BP	TCF060203BC
5577920	TCF150R2SLR25MB	15,00	15,50	25	51,5	30,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577921	TCF155R2SLR25MB	15,50	16,00	25	53,6	31,6	0,56	56,00	B	TCF050204BP	TCF060203BC
5577922	TCF160R2SLR25MB	16,00	16,50	25	54,6	32,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577923	TCF165R2SLR25MB	16,50	17,00	25	56,6	33,6	0,60	56,00	B	TCF050204BP	TCF060203BC
5577924	TCF170R2SLR25MB	17,00	17,50	25	57,6	34,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577925	TCF175R2SLR25MB	17,50	18,00	25	59,6	35,6	0,63	56,00	B	TCF050204BP	TCF060203BC
5577926	TCF180R2SLR25MB	18,00	18,50	25	60,6	36,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577927	TCF185R2SLR25MB	18,50	19,00	25	62,7	37,7	0,65	56,00	B	TCF050204BP	TCF060203BC
5578820	TCF190R2SLR25MC	19,00	19,50	25	63,7	38,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578821	TCF195R2SLR25MC	19,50	20,00	25	65,7	39,7	0,71	56,00	C	TCF070306CP	TCF070304CC
5578822	TCF200R2SLR25MC	20,00	20,50	25	66,7	40,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578823	TCF205R2SLR25MC	20,50	21,00	25	68,7	41,7	0,74	56,00	C	TCF070306CP	TCF070304CC
5578824	TCF210R2SLR25MC	21,00	21,50	25	70,8	42,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578825	TCF220R2SLR25MC	22,00	22,50	25	73,8	44,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578826	TCF225R2SLR25MC	22,50	23,00	25	74,8	45,8	0,79	56,00	C	TCF070306CP	TCF070304CC
5578827	TCF230R2SLR25MC	23,00	23,50	25	76,8	46,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537167	TCF240R2SLR25MD	24,00	25,00	25	76,9	48,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537168	TCF250R2SLR32MD	25,00	26,00	32	80,9	50,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537169	TCF260R2SLR32MD	26,00	27,00	32	83,9	52,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537820	TCF265R2SLR32MD	26,50	27,50	32	86,0	54,0	0,95	60,00	D	TCF080308DP	TCF090305DC
5537821	TCF270R2SLR32MD	27,00	28,00	32	87,0	55,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537822	TCF280R2SLR32MD	28,00	29,00	32	90,0	57,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537823	TCF290R2SLR32MD	29,00	30,00	32	93,0	59,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537937	TCF300R2SLR32ME	30,00	31,00	32	93,1	61,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537938	TCF310R2SLR32ME	31,00	32,00	32	96,1	63,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537939	TCF320R2SLR32ME	32,00	33,00	32	99,2	65,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537940	TCF330R2SLR40ME	33,00	34,00	40	103,2	67,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537941	TCF340R2SLR40ME	34,00	35,00	40	106,2	69,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537942	TCF350R2SLR40ME	35,00	36,00	40	109,2	71,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537943	TCF360R2SLR40ME	36,00	37,00	40	112,3	73,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578539	TCF370R2SLR40MF	37,00	38,00	40	115,3	75,3	1,35	70,00	F	TCF120412FP	TCF150406FC
5578600	TCF375R2SLR40MF	37,50	38,50	40	116,4	76,4	1,36	70,00	F	TCF120412FP	TCF150406FC
5578601	TCF380R2SLR40MF	38,00	39,00	40	118,4	77,4	1,38	70,00	F	TCF120412FP	TCF150406FC
5578602	TCF390R2SLR40MF	39,00	40,00	40	121,4	79,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578603	TCF400R2SLR40MF	40,00	41,00	40	123,4	81,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578604	TCF410R2SLR40MF	41,00	42,00	40	126,5	83,5	1,48	70,00	F	TCF120412FP	TCF150406FC
5578605	TCF420R2SLR40MF	42,00	43,00	40	129,5	85,5	1,51	70,00	F	TCF120412FP	TCF150406FC
5578606	TCF430R2SLR40MF	43,00	44,00	40	132,5	87,5	1,53	70,00	F	TCF120412FP	TCF150406FC
5578607	TCF440R2SLR40MF	44,00	45,00	40	135,6	89,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578608	TCF450R2SLR40MF	45,00	46,00	40	138,6	91,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578694	TCF460R2SLR40MG	46,00	47,00	40	136,7	93,7	1,67	70,00	G	TCF150512GP	TCF180508GC
5578695	TCF470R2SLR40MG	47,00	48,00	40	139,7	95,7	1,70	70,00	G	TCF150512GP	TCF180508GC
5578696	TCF480R2SLR40MG	48,00	49,00	40	142,7	97,7	1,73	70,00	G	TCF150512GP	TCF180508GC
5578697	TCF490R2SLR40MG	49,00	50,00	40	145,8	99,8	1,76	70,00	G	TCF150512GP	TCF180508GC
5578698	TCF500R2SLR40MG	50,00	51,00	40	147,8	101,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578699	TCF505R2SLR40MG	50,50	51,50	40	149,8	102,8	1,80	70,00	G	TCF150512GP	TCF180508GC
5578710	TCF510R2SLR40MG	51,00	52,00	40	150,8	103,8	1,81	70,00	G	TCF150512GP	TCF180508GC
5578711	TCF520R2SLR40MG	52,00	53,00	40	153,8	105,8	1,84	70,00	G	TCF150512GP	TCF180508GC
5578712	TCF530R2SLR40MG	53,00	54,00	40	156,9	107,9	1,87	70,00	G	TCF150512GP	TCF180508GC
5578713	TCF540R2SLR40MG	54,00	55,00	40	159,9	109,9	1,89	70,00	G	TCF150512GP	TCF180508GC
5578714	TCF550R2SLR40MG	55,00	56,00	40	161,9	111,9	1,92	70,00	G	TCF150512GP	TCF180508GC
5578715	TCF560R2SLR40MG	56,00	57,00	40	164,9	113,9	1,94	70,00	G	TCF150512GP	TCF180508GC
5538613	TCF570R2SLR40MH	57,00	58,00	40	162,1	116,1	2,06	70,00	H	TCF180614HP	TCF210608HC
5538614	TCF580R2SLR40MH	58,00	59,00	40	165,1	118,1	2,09	70,00	H	TCF180614HP	TCF210608HC
5538615	TCF590R2SLR40MH	59,00	60,00	40	168,1	120,1	2,12	70,00	H	TCF180614HP	TCF210608HC
5538616	TCF600R2SLR40MH	60,00	61,00	40	170,1	122,1	2,15	70,00	H	TCF180614HP	TCF210608HC
5538617	TCF610R2SLR40MH	61,00	62,00	40	173,2	124,2	2,18	70,00	H	TCF180614HP	TCF210608HC

Top Cut 4 • 2 x D • SLR Shanks • Metric

(continued)



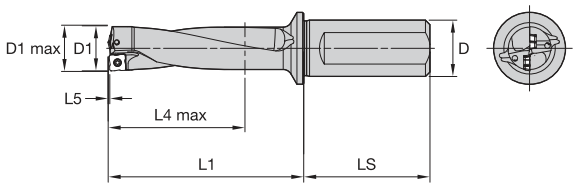
order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5538618	**TCF620R2SLR40MH**	62,00	63,00	40	176,2	126,2	2,20	70,00	H	**TCF180614HP**	**TCF210608HC**
5538619	**TCF630R2SLR40MH**	63,00	64,00	40	179,2	128,2	2,23	70,00	H	**TCF180614HP**	**TCF210608HC**
5538630	**TCF640R2SLR40MH**	64,00	65,00	40	181,3	130,3	2,26	70,00	H	**TCF180614HP**	**TCF210608HC**
5538631	**TCF650R2SLR40MH**	65,00	66,00	40	184,3	132,3	2,28	70,00	H	**TCF180614HP**	**TCF210608HC**
5538632	**TCF660R2SLR40MH**	66,00	67,00	40	187,3	134,3	2,31	70,00	H	**TCF180614HP**	**TCF210608HC**
5538633	**TCF670R2SLR40MH**	67,00	68,00	40	189,3	136,3	2,33	70,00	H	**TCF180614HP**	**TCF210608HC**
5538634	**TCF680R2SLR40MH**	68,00	69,00	40	192,4	138,4	2,36	70,00	H	**TCF180614HP**	**TCF210608HC**

D	LS
20,00	50
25,00	56
32,00	60
40,00	70

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
Drill shipped with insert screws and Torx wrench.
See pages C97–C104 for inserts.
SSC = Pocket Seat Reference.
SLR = Side Lock.
D1 max is an achievable diameter using x-offset.

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece.
When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force.
Provide adequate shielding to protect bystanders.

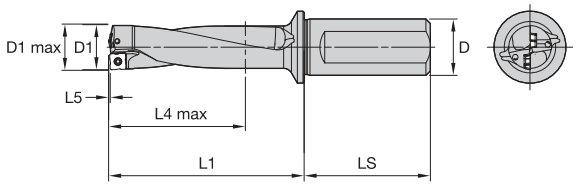
Top Cut 4 • 3 x D • SLR Shanks • Metric



order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5537863	TCF120R3SLR20MA	12,00	12,50	20	55,4	36,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537864	TCF125R3SLR20MA	12,50	13,00	20	57,0	38,0	0,45	50,00	A	TCF040204AP	TCF040203AC
5537866	TCF127R3SLR20MA	12,70	13,20	20	58,6	38,6	0,46	50,00	A	TCF040204AP	TCF040203AC
5537867	TCF130R3SLR20MA	13,00	13,50	20	59,5	39,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5537868	TCF135R3SLR20MA	13,50	14,00	20	61,0	41,0	0,48	50,00	A	TCF040204AP	TCF040203AC
5577928	TCF140R3SLR25MB	14,00	14,50	25	62,5	42,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577929	TCF145R3SLR25MB	14,50	15,00	25	64,0	44,0	0,52	56,00	B	TCF050204BP	TCF060203BC
5577930	TCF150R3SLR25MB	15,00	15,50	25	66,5	45,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577931	TCF155R3SLR25MB	15,50	16,00	25	69,1	47,1	0,56	56,00	B	TCF050204BP	TCF060203BC
5577932	TCF160R3SLR25MB	16,00	16,50	25	70,6	48,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577933	TCF165R3SLR25MB	16,50	17,00	25	73,1	50,1	0,60	56,00	B	TCF050204BP	TCF060203BC
5577934	TCF170R3SLR25MB	17,00	17,50	25	74,6	51,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577935	TCF175R3SLR25MB	17,50	18,00	25	77,1	53,1	0,63	56,00	B	TCF050204BP	TCF060203BC
5577936	TCF180R3SLR25MB	18,00	18,50	25	78,6	54,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577937	TCF185R3SLR25MB	18,50	19,00	25	81,2	56,2	0,65	56,00	B	TCF050204BP	TCF060203BC
5578828	TCF190R3SLR25MC	19,00	19,50	25	82,7	57,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578829	TCF195R3SLR25MC	19,50	20,00	25	85,2	59,2	0,71	56,00	C	TCF070306CP	TCF070304CC
5578830	TCF200R3SLR25MC	20,00	20,50	25	86,7	60,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578831	TCF205R3SLR25MC	20,50	21,00	25	89,2	62,2	0,74	56,00	C	TCF070306CP	TCF070304CC
5578832	TCF210R3SLR25MC	21,00	21,50	25	91,8	63,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578833	TCF220R3SLR25MC	22,00	22,50	25	95,8	66,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578834	TCF225R3SLR25MC	22,50	23,00	25	97,3	68,3	0,79	56,00	C	TCF070306CP	TCF070304CC
5578835	TCF230R3SLR25MC	23,00	23,50	25	99,8	69,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537824	TCF240R3SLR25MD	24,00	25,00	25	100,9	72,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537825	TCF250R3SLR32MD	25,00	26,00	32	105,9	75,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537826	TCF260R3SLR32MD	26,00	27,00	32	109,9	78,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537827	TCF265R3SLR32MD	26,50	27,50	32	112,5	80,5	0,95	60,00	D	TCF080308DP	TCF090305DC
5537828	TCF270R3SLR32MD	27,00	28,00	32	114,0	82,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537829	TCF280R3SLR32MD	28,00	29,00	32	118,0	85,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537830	TCF290R3SLR32MD	29,00	30,00	32	122,0	88,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537944	TCF300R3SLR32ME	30,00	31,00	32	123,1	91,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537945	TCF310R3SLR32ME	31,00	32,00	32	127,1	94,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537946	TCF320R3SLR32ME	32,00	33,00	32	131,2	97,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537947	TCF330R3SLR40ME	33,00	34,00	40	136,2	100,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537948	TCF340R3SLR40ME	34,00	35,00	40	140,2	103,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537949	TCF350R3SLR40ME	35,00	36,00	40	144,2	106,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537950	TCF360R3SLR40ME	36,00	37,00	40	148,3	109,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578609	TCF370R3SLR40MF	37,00	38,00	40	152,3	112,3	1,35	70,00	F	TCF120412FP	TCF150406FC
5578610	TCF375R3SLR40MF	37,50	38,50	40	153,9	113,9	1,36	70,00	F	TCF120412FP	TCF150406FC
5578611	TCF380R3SLR40MF	38,00	39,00	40	156,4	115,4	1,38	70,00	F	TCF120412FP	TCF150406FC
5578612	TCF390R3SLR40MF	39,00	40,00	40	160,4	118,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578613	TCF400R3SLR40MF	40,00	41,00	40	163,4	121,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578614	TCF410R3SLR40MF	41,00	42,00	40	167,5	124,5	1,48	70,00	F	TCF120412FP	TCF150406FC
5578615	TCF420R3SLR40MF	42,00	43,00	40	171,5	127,5	1,51	70,00	F	TCF120412FP	TCF150406FC
5578616	TCF430R3SLR40MF	43,00	44,00	40	175,5	130,5	1,53	70,00	F	TCF120412FP	TCF150406FC
5578617	TCF440R3SLR40MF	44,00	45,00	40	179,6	133,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578618	TCF450R3SLR40MF	45,00	46,00	40	183,6	136,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578716	TCF460R3SLR40MG	46,00	47,00	40	182,7	139,7	1,67	70,00	G	TCF150512GP	TCF180508GC
5578717	TCF470R3SLR40MG	47,00	48,00	40	186,7	142,7	1,70	70,00	G	TCF150512GP	TCF180508GC
5578718	TCF480R3SLR40MG	48,00	49,00	40	190,7	145,7	1,73	70,00	G	TCF150512GP	TCF180508GC
5578719	TCF490R3SLR40MG	49,00	50,00	40	194,8	148,8	1,76	70,00	G	TCF150512GP	TCF180508GC
5578720	TCF500R3SLR40MG	50,00	51,00	40	197,8	151,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578721	TCF505R3SLR40MG	50,50	51,50	40	200,3	153,3	1,80	70,00	G	TCF150512GP	TCF180508GC
5578722	TCF510R3SLR40MG	51,00	52,00	40	201,8	154,8	1,81	70,00	G	TCF150512GP	TCF180508GC
5578723	TCF520R3SLR40MG	52,00	53,00	40	205,8	157,8	1,84	70,00	G	TCF150512GP	TCF180508GC
5578724	TCF530R3SLR40MG	53,00	54,00	40	209,9	160,9	1,87	70,00	G	TCF150512GP	TCF180508GC
5578726	TCF540R3SLR40MG	54,00	55,00	40	213,9	163,9	1,89	70,00	G	TCF150512GP	TCF180508GC
5578727	TCF550R3SLR40MG	55,00	56,00	40	216,9	166,9	1,92	70,00	G	TCF150512GP	TCF180508GC
5578728	TCF560R3SLR40MG	56,00	57,00	40	220,9	169,9	1,94	70,00	G	TCF150512GP	TCF180508GC
5538635	TCF570R3SLR40MH	57,00	58,00	40	219,1	173,1	2,06	70,00	H	TCF180614HP	TCF210608HC
5538636	TCF580R3SLR40MH	58,00	59,00	40	223,1	176,1	2,09	70,00	H	TCF180614HP	TCF210608HC
5538637	TCF590R3SLR40MH	59,00	60,00	40	227,1	179,1	2,12	70,00	H	TCF180614HP	TCF210608HC
5538638	TCF600R3SLR40MH	60,00	61,00	40	230,1	182,1	2,15	70,00	H	TCF180614HP	TCF210608HC
5538639	TCF610R3SLR40MH	61,00	62,00	40	234,2	185,2	2,18	70,00	H	TCF180614HP	TCF210608HC

Top Cut 4 • 3 x D • SLR Shanks • Metric

(continued)



order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5538640	**TCF620R3SLR40MH**	62,00	63,00	40	238,2	188,2	2,20	70,00	H	**TCF180614HP**	**TCF210608HC**
5538641	**TCF630R3SLR40MH**	63,00	64,00	40	242,2	191,2	2,23	70,00	H	**TCF180614HP**	**TCF210608HC**
5538642	**TCF640R3SLR40MH**	64,00	65,00	40	245,3	194,3	2,26	70,00	H	**TCF180614HP**	**TCF210608HC**
5538643	**TCF650R3SLR40MH**	65,00	66,00	40	249,3	197,3	2,28	70,00	H	**TCF180614HP**	**TCF210608HC**
5538644	**TCF660R3SLR40MH**	66,00	67,00	40	253,3	200,3	2,31	70,00	H	**TCF180614HP**	**TCF210608HC**
5538645	**TCF670R3SLR40MH**	67,00	68,00	40	256,3	203,3	2,33	70,00	H	**TCF180614HP**	**TCF210608HC**
5538646	**TCF680R3SLR40MH**	68,00	69,00	40	260,4	206,4	2,36	70,00	H	**TCF180614HP**	**TCF210608HC**

D	LS
20,00	50
25,00	56
32,00	60
40,00	70

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
Drill shipped with insert screws and Torx wrench.
See pages C97–C104 for inserts.
SSC = Pocket Seat Reference.
SLR = Side Lock.
D1 max is an achievable diameter using x-offset.

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece.
When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force.
Provide adequate shielding to protect bystanders.

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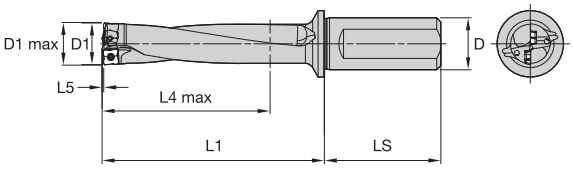
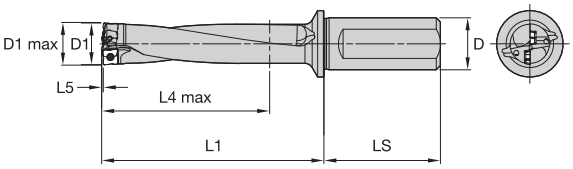


order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5537869	TCF120R4SLR20MA	12,00	12,50	20	67,4	48,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537870	TCF125R4SLR20MA	12,50	13,00	20	69,5	50,5	0,45	50,00	A	TCF040204AP	TCF040203AC
5537871	TCF127R4SLR20MA	12,70	13,20	20	71,3	51,3	0,46	50,00	A	TCF040204AP	TCF040203AC
5537872	TCF130R4SLR20MA	13,00	13,50	20	72,5	52,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5537873	TCF135R4SLR20MA	13,50	14,00	20	75,5	54,5	0,48	50,00	A	TCF040204AP	TCF040203AC
5577938	TCF140R4SLR25MB	14,00	14,50	25	76,5	56,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577939	TCF145R4SLR25MB	14,50	15,00	25	78,5	58,5	0,52	56,00	B	TCF050204BP	TCF060203BC
5577940	TCF150R4SLR25MB	15,00	15,50	25	81,5	60,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577941	TCF155R4SLR25MB	15,50	16,00	25	84,6	62,6	0,56	56,00	B	TCF050204BP	TCF060203BC
5577942	TCF160R4SLR25MB	16,00	16,50	25	86,6	64,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577943	TCF165R4SLR25MB	16,50	17,00	25	89,6	66,6	0,60	56,00	B	TCF050204BP	TCF060203BC
5577944	TCF170R4SLR25MB	17,00	17,50	25	91,6	68,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577945	TCF175R4SLR25MB	17,50	18,00	25	94,6	70,6	0,63	56,00	B	TCF050204BP	TCF060203BC
5577946	TCF180R4SLR25MB	18,00	18,50	25	96,6	72,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577947	TCF185R4SLR25MB	18,50	19,00	25	99,7	74,7	0,65	56,00	B	TCF050204BP	TCF060203BC
5578836	TCF190R4SLR25MC	19,00	19,50	25	101,7	76,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578837	TCF195R4SLR25MC	19,50	20,00	25	104,7	78,7	0,71	56,00	C	TCF070306CP	TCF070304CC
5578838	TCF200R4SLR25MC	20,00	20,50	25	106,7	80,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578839	TCF205R4SLR25MC	20,50	21,00	25	109,7	82,7	0,74	56,00	C	TCF070306CP	TCF070304CC
5578840	TCF210R4SLR25MC	21,00	21,50	25	112,8	84,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578841	TCF220R4SLR25MC	22,00	22,50	25	117,8	88,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578842	TCF225R4SLR25MC	22,50	23,00	25	119,8	90,8	0,79	56,00	C	TCF070306CP	TCF070304CC
5578843	TCF230R4SLR25MC	23,00	23,50	25	122,8	92,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537831	TCF240R4SLR25MD	24,00	25,00	25	124,9	96,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537832	TCF250R4SLR32MD	25,00	26,00	32	130,9	100,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537833	TCF260R4SLR32MD	26,00	27,00	32	135,9	104,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537834	TCF265R4SLR32MD	26,50	27,50	32	139,0	107,0	0,95	60,00	D	TCF080308DP	TCF090305DC
5537835	TCF270R4SLR32MD	27,00	28,00	32	141,0	109,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537836	TCF280R4SLR32MD	28,00	29,00	32	146,0	113,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537837	TCF290R4SLR32MD	29,00	30,00	32	151,0	117,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537951	TCF300R4SLR32ME	30,00	31,00	32	153,1	121,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537952	TCF310R4SLR32ME	31,00	32,00	32	158,1	125,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537953	TCF320R4SLR32ME	32,00	33,00	32	163,2	129,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537954	TCF330R4SLR40ME	33,00	34,00	40	165,2	133,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537955	TCF340R4SLR40ME	34,00	35,00	40	174,2	137,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537956	TCF350R4SLR40ME	35,00	36,00	40	179,2	141,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537957	TCF360R4SLR40ME	36,00	37,00	40	184,3	145,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578619	TCF370R4SLR40MF	37,00	38,00	40	189,3	149,3	1,35	70,00	F	TCF120412FP	TCF150406FC
5578620	TCF375R4SLR40MF	37,50	38,50	40	191,4	151,4	1,36	70,00	F	TCF120412FP	TCF150406FC
5578621	TCF380R4SLR40MF	38,00	39,00	40	194,4	153,4	1,38	70,00	F	TCF120412FP	TCF150406FC
5578622	TCF390R4SLR40MF	39,00	40,00	40	199,4	157,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578623	TCF400R4SLR40MF	40,00	41,00	40	203,4	161,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578624	TCF410R4SLR40MF	41,00	42,00	40	208,5	165,5	1,48	70,00	F	TCF120412FP	TCF150406FC
5578625	TCF420R4SLR40MF	42,00	43,00	40	213,5	169,5	1,51	70,00	F	TCF120412FP	TCF150406FC
5578626	TCF430R4SLR40MF	43,00	44,00	40	218,5	173,5	1,53	70,00	F	TCF120412FP	TCF150406FC
5578627	TCF440R4SLR40MF	44,00	45,00	40	223,6	177,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578628	TCF450R4SLR40MF	45,00	46,00	40	228,6	181,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578729	TCF460R4SLR40MG	46,00	47,00	40	228,7	185,7	1,67	70,00	G	TCF150512GP	TCF180508GC
5578730	TCF470R4SLR40MG	47,00	48,00	40	233,7	189,7	1,70	70,00	G	TCF150512GP	TCF180508GC
5578731	TCF480R4SLR40MG	48,00	49,00	40	238,7	193,7	1,73	70,00	G	TCF150512GP	TCF180508GC
5578732	TCF490R4SLR40MG	49,00	50,00	40	243,8	197,8	1,76	70,00	G	TCF150512GP	TCF180508GC
5578733	TCF500R4SLR40MG	50,00	51,00	40	247,8	201,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578734	TCF505R4SLR40MG	50,50	51,50	40	250,8	203,8	1,80	70,00	G	TCF150512GP	TCF180508GC
5578735	TCF510R4SLR40MG	51,00	52,00	40	252,8	205,8	1,81	70,00	G	TCF150512GP	TCF180508GC
5578736	TCF520R4SLR40MG	52,00	53,00	40	257,8	209,8	1,84	70,00	G	TCF150512GP	TCF180508GC
5578737	TCF530R4SLR40MG	53,00	54,00	40	262,9	213,9	1,87	70,00	G	TCF150512GP	TCF180508GC
5578738	TCF540R4SLR40MG	54,00	55,00	40	267,9	217,9	1,89	70,00	G	TCF150512GP	TCF180508GC
5578739	TCF550R4SLR40MG	55,00	56,00	40	271,9	221,9	1,92	70,00	G	TCF150512GP	TCF180508GC
5578750	TCF560R4SLR40MG	56,00	57,00	40	276,9	225,9	1,94	70,00	G	TCF150512GP	TCF180508GC
5538647	TCF570R4SLR40MH	57,00	58,00	40	276,1	230,1	2,06	70,00	H	TCF180614HP	TCF210608HC
5538648	TCF580R4SLR40MH	58,00	59,00	40	281,1	234,1	2,09	70,00	H	TCF180614HP	TCF210608HC
5538649	TCF590R4SLR40MH	59,00	60,00	40	286,1	238,1	2,12	70,00	H	TCF180614HP	TCF210608HC
5538650	TCF600R4SLR40MH	60,00	61,00	40	290,1	242,1	2,15	70,00	H	TCF180614HP	TCF210608HC
5538651	TCF610R4SLR40MH	61,00	62,00	40	295,2	246,2	2,18	70,00	H	TCF180614HP	TCF210608HC

Top Cut 4 • 4 x D • SLR Shanks • Metric

(continued)



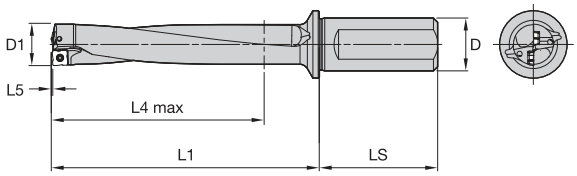
order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5538652	**TCF620R4SLR40MH**	62,00	63,00	40	300,2	250,2	2,20	70,00	H	**TCF180614HP**	**TCF210608HC**
5538653	**TCF630R4SLR40MH**	63,00	64,00	40	305,2	254,2	2,23	70,00	H	**TCF180614HP**	**TCF210608HC**
5538654	**TCF640R4SLR40MH**	64,00	65,00	40	309,3	258,3	2,26	70,00	H	**TCF180614HP**	**TCF210608HC**
5538655	**TCF650R4SLR40MH**	65,00	66,00	40	314,3	262,3	2,28	70,00	H	**TCF180614HP**	**TCF210608HC**
5538656	**TCF660R4SLR40MH**	66,00	67,00	40	319,3	266,3	2,31	70,00	H	**TCF180614HP**	**TCF210608HC**
5538657	**TCF670R4SLR40MH**	67,00	68,00	40	323,3	270,3	2,33	70,00	H	**TCF180614HP**	**TCF210608HC**
5538658	**TCF680R4SLR40MH**	68,00	69,00	40	328,4	274,4	2,36	70,00	H	**TCF180614HP**	**TCF210608HC**

D	LS
20,00	50
25,00	56
32,00	60
40,00	70

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
Drill shipped with insert screws and Torx wrench.
See pages C97–C104 for inserts.
SSC = Pocket Seat Reference.
SLR = Side Lock.
D1 max is an achievable diameter using x-offset.

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece.
When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force.
Provide adequate shielding to protect bystanders.

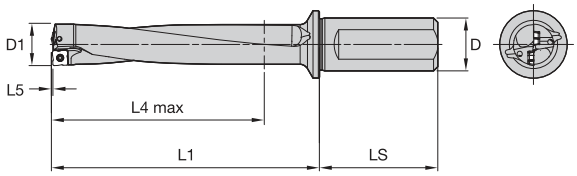
Top Cut 4 • 5 x D • SLR Shank • Metric



order number	catalogue number	D1	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5537874	TCF120R5SLR20MA	12,00	20	79,4	60,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537875	TCF125R5SLR20MA	12,50	20	82,0	63,0	0,45	50,00	A	TCF040204AP	TCF040203AC
5537876	TCF127R5SLR20MA	12,70	20	84,0	64,0	0,46	50,00	A	TCF040204AP	TCF040203AC
5537877	TCF130R5SLR20MA	13,00	20	85,5	65,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5537878	TCF135R5SLR20MA	13,50	20	89,0	68,0	0,48	50,00	A	TCF040204AP	TCF040203AC
5577948	TCF140R5SLR25MB	14,00	25	90,5	70,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577949	TCF145R5SLR25MB	14,50	25	93,0	73,0	0,52	56,00	B	TCF050204BP	TCF060203BC
5577950	TCF150R5SLR25MB	15,00	25	96,5	75,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577951	TCF155R5SLR25MB	15,50	25	100,1	78,1	0,56	56,00	B	TCF050204BP	TCF060203BC
5577952	TCF160R5SLR25MB	16,00	25	102,6	80,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577953	TCF165R5SLR25MB	16,50	25	106,1	83,1	0,60	56,00	B	TCF050204BP	TCF060203BC
5577954	TCF170R5SLR25MB	17,00	25	108,6	85,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577955	TCF175R5SLR25MB	17,50	25	112,1	88,1	0,63	56,00	B	TCF050204BP	TCF060203BC
5577956	TCF180R5SLR25MB	18,00	25	114,6	90,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577957	TCF185R5SLR25MB	18,50	25	118,2	93,2	0,65	56,00	B	TCF050204BP	TCF060203BC
5578844	TCF190R5SLR25MC	19,00	25	120,7	95,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578845	TCF195R5SLR25MC	19,50	25	124,2	98,2	0,71	56,00	C	TCF070306CP	TCF070304CC
5578846	TCF200R5SLR25MC	20,00	25	126,7	100,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578847	TCF205R5SLR25MC	20,50	25	130,2	103,2	0,74	56,00	C	TCF070306CP	TCF070304CC
5578848	TCF210R5SLR25MC	21,00	25	133,8	105,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578849	TCF220R5SLR25MC	22,00	25	139,8	110,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578850	TCF225R5SLR25MC	22,50	25	142,3	113,3	0,79	56,00	C	TCF070306CP	TCF070304CC
5578851	TCF230R5SLR25MC	23,00	25	145,8	115,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537838	TCF240R5SLR25MD	24,00	25	148,9	120,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537839	TCF250R5SLR32MD	25,00	32	155,9	125,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537840	TCF260R5SLR32MD	26,00	32	161,9	130,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537841	TCF265R5SLR32MD	26,50	32	165,5	133,5	0,95	60,00	D	TCF080308DP	TCF090305DC
5537842	TCF270R5SLR32MD	27,00	32	168,0	136,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537843	TCF280R5SLR32MD	28,00	32	174,0	141,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537844	TCF290R5SLR32MD	29,00	32	180,0	146,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537958	TCF300R5SLR32ME	30,00	32	183,1	151,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537959	TCF310R5SLR32ME	31,00	32	189,1	156,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537960	TCF320R5SLR32ME	32,00	32	195,2	161,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537961	TCF330R5SLR40ME	33,00	40	202,2	166,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537962	TCF340R5SLR40ME	34,00	40	208,2	171,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537963	TCF350R5SLR40ME	35,00	40	214,2	176,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537964	TCF360R5SLR40ME	36,00	40	220,3	181,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578629	TCF370R5SLR40MF	37,00	40	226,3	186,3	1,35	70,00	F	TCF120412FP	TCF150406FC
5578640	TCF375R5SLR40MF	37,50	40	228,9	188,9	1,36	70,00	F	TCF120412FP	TCF150406FC
5578641	TCF380R5SLR40MF	38,00	40	232,4	191,4	1,38	70,00	F	TCF120412FP	TCF150406FC
5578642	TCF390R5SLR40MF	39,00	40	238,4	196,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578643	TCF400R5SLR40MF	40,00	40	243,4	201,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578644	TCF410R5SLR40MF	41,00	40	249,5	206,5	1,48	70,00	F	TCF120412FP	TCF150406FC
5578645	TCF420R5SLR40MF	42,00	40	255,5	211,5	1,51	70,00	F	TCF120412FP	TCF150406FC
5578646	TCF430R5SLR40MF	43,00	40	261,5	216,5	1,53	70,00	F	TCF120412FP	TCF150406FC
5578647	TCF440R5SLR40MF	44,00	40	267,6	221,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578648	TCF450R5SLR40MF	45,00	40	273,6	226,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578751	TCF460R5SLR40MG	46,00	40	274,7	231,7	1,67	70,00	G	TCF150512GP	TCF180508GC
5578752	TCF470R5SLR40MG	47,00	40	280,7	236,7	1,70	70,00	G	TCF150512GP	TCF180508GC
5578753	TCF480R5SLR40MG	48,00	40	286,7	241,7	1,73	70,00	G	TCF150512GP	TCF180508GC
5578754	TCF490R5SLR40MG	49,00	40	292,8	246,8	1,76	70,00	G	TCF150512GP	TCF180508GC
5578755	TCF500R5SLR40MG	50,00	40	297,8	251,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578756	TCF505R5SLR40MG	50,50	40	301,3	254,3	1,80	70,00	G	TCF150512GP	TCF180508GC
5578757	TCF510R5SLR40MG	51,00	40	303,8	256,8	1,81	70,00	G	TCF150512GP	TCF180508GC
5578758	TCF520R5SLR40MG	52,00	40	309,8	261,8	1,84	70,00	G	TCF150512GP	TCF180508GC
5578759	TCF530R5SLR40MG	53,00	40	315,9	266,9	1,87	70,00	G	TCF150512GP	TCF180508GC
5578760	TCF540R5SLR40MG	54,00	40	321,9	271,9	1,89	70,00	G	TCF150512GP	TCF180508GC
5578761	TCF550R5SLR40MG	55,00	40	326,9	276,9	1,92	70,00	G	TCF150512GP	TCF180508GC
5578762	TCF560R5SLR40MG	56,00	40	332,9	281,9	1,94	70,00	G	TCF150512GP	TCF180508GC
5538659	TCF570R5SLR40MH	57,00	40	333,1	287,1	2,06	70,00	H	TCF180614HP	TCF210608HC
5538680	TCF580R5SLR40MH	58,00	40	339,1	292,1	2,09	70,00	H	TCF180614HP	TCF210608HC
5538681	TCF590R5SLR40MH	59,00	40	345,1	297,1	2,12	70,00	H	TCF180614HP	TCF210608HC
5538682	TCF600R5SLR40MH	60,00	40	350,1	302,1	2,15	70,00	H	TCF180614HP	TCF210608HC
5538683	TCF610R5SLR40MH	61,00	40	356,2	307,2	2,18	70,00	H	TCF180614HP	TCF210608HC

Top Cut 4 • 5 x D • SLR Shank • Metric

(continued)



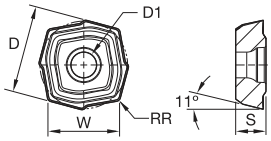
order number	catalogue number	D1	D	L1	L4 max	L5	LS	SSC	periphery insert	center insert
5538684	**TCF620R5SLR40MH**	62,00	40	362,2	312,2	2,20	70,00	H	**TCF180614HP**	**TCF210608HC**
5538685	**TCF630R5SLR40MH**	63,00	40	368,2	317,2	2,23	70,00	H	**TCF180614HP**	**TCF210608HC**
5538686	**TCF640R5SLR40MH**	64,00	40	373,3	322,3	2,26	70,00	H	**TCF180614HP**	**TCF210608HC**
5538687	**TCF650R5SLR40MH**	65,00	40	379,3	327,3	2,28	70,00	H	**TCF180614HP**	**TCF210608HC**
5538688	**TCF660R5SLR40MH**	66,00	40	385,3	332,3	2,31	70,00	H	**TCF180614HP**	**TCF210608HC**
5538689	**TCF670R5SLR40MH**	67,00	40	390,3	337,3	2,33	70,00	H	**TCF180614HP**	**TCF210608HC**
5538700	**TCF680R5SLR40MH**	68,00	40	396,4	342,4	2,36	70,00	H	**TCF180614HP**	**TCF210608HC**

D	LS
20,00	50
25,00	56
32,00	60
40,00	70

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.
NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
Drill shipped with insert screws and Torx wrench.
See pages C97–C104 for inserts.
SSC = Pocket Seat Reference.
SLR = Side Lock.

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece.
When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force.
Provide adequate shielding to protect bystanders.

Top Cut 4 • Center Inserts • Roughing V34



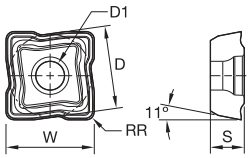
● first choice
○ alternate choice

P		○	●
M		○	○
K		○	●
N			
S			
H			

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040203ACV34	4,47	2,10	3,65	2,00	0,300	A	5541817	5541818
TCF060203BCV34	6,00	2,40	4,90	2,40	0,300	B	5542602	5542604
TCF070304CCV34	7,59	2,60	6,20	2,80	0,400	C	5542642	5542643
TCF090305DCV34	9,55	2,80	7,80	3,00	0,500	D	5538554	5538555
TCF120405ECV34	12,00	3,40	9,80	3,60	0,500	E	5538603	5538604
TCF150406FCV34	14,94	4,80	12,20	4,20	0,600	F	5542623	5542624
TCF180508GCV34	17,88	6,00	14,60	5,40	0,800	G	5542475	5542476
TCF210608HCV34	21,68	7,50	17,70	6,50	0,800	H	5542002	5542003

NOTE :For application-specific insert selection, please refer to the application data on page C107.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Periphery Inserts • Roughing V34



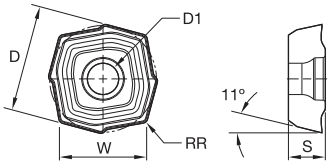
● first choice
○ alternate choice

P	○	●	○
M		○	○
K	○	●	○
N			
S			
H			

catalogue number	D	D1	W	S	RR	SSC	WPK10CH	WU25CH	WU40PH
TCF040204APV34	4,14	2,10	4,40	2,00	0,400	A	5541843	5541841	5541842
TCF050204BPV34	5,07	2,40	5,40	2,40	0,400	B	5542620	5542608	5542609
TCF070306CPV34	6,67	2,60	7,10	2,80	0,600	C	5542648	5542646	5542647
TCF080308DPV34	8,08	2,80	8,60	3,00	0,800	D	5538600	5538558	5538559
TCF100408EPV34	9,96	3,40	10,60	3,60	0,800	E	5538610	5538608	5538609
TCF120412FPV34	12,59	4,80	13,40	4,20	1,200	F	5542629	5542627	5542628
TCF150512GPV34	15,13	6,00	16,10	5,40	1,200	G	5542601	5542479	5542600
TCF180614HPV34	18,04	7,50	19,20	6,50	1,400	H	5542008	5542006	5542007

NOTE :For application-specific insert selection, please refer to the application data on page C107.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Center Inserts • Aluminum V36



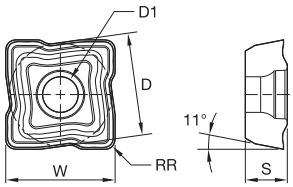
● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

catalogue number	D	D1	W	S	RR	SSC	WN10PH
TCF040203ACV36	4,47	2,10	3,65	2,00	0,300	A	6407887
TCF060203BCV36	6,00	2,40	4,90	2,40	0,300	B	6372041
TCF070304CCV36	7,59	2,60	6,20	2,80	0,400	C	6372042
TCF090305DCV36	9,55	2,80	7,80	3,00	0,500	D	6372045
TCF120405ECV36	12,00	3,40	9,80	3,60	0,500	E	6372047
TCF150406FCV36	14,94	4,80	12,20	4,20	0,600	F	6346757
TCF180508GCV36	17,88	6,00	14,60	5,40	0,800	G	6407890
TCF210608HCV36	21,68	7,50	17,70	6,50	0,800	H	6372049

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Periphery Inserts • Aluminum V36



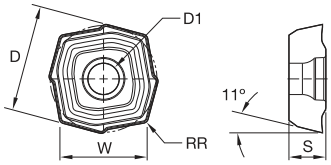
● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

catalogue number	D	D1	W	S	RR	SSC	WN10PH
TCF040204APV36	4,14	2,10	4,40	2,00	0,400	A	6407888
TCF050204BPV36	5,07	2,40	5,40	2,40	0,400	B	6371850
TCF070306CPV36	6,67	2,60	7,10	2,80	0,600	C	6372043
TCF080308DPV36	8,08	2,80	8,60	3,00	0,800	D	6372044
TCF100408EPV36	9,96	3,40	10,60	3,60	0,800	E	6372046
TCF120412FPV36	12,59	4,80	13,40	4,20	1,200	F	6348893
TCF150512GPV36	15,13	6,00	16,10	5,40	1,200	G	6407889
TCF180614HPV36	18,04	7,50	19,20	6,50	1,400	H	6372048

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Center Inserts • Roughing V36



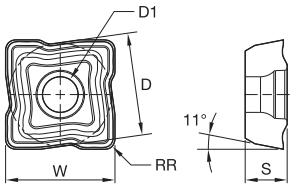
● first choice
○ alternate choice

P	○	●
M	○	●
K	○	●
N		
S		
H		

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040203ACV36	4,47	2,10	3,65	2,00	0,300	A	5541819	5541840
TCF060203BCV36	6,00	2,40	4,90	2,40	0,300	B	5542606	5542607
TCF070304CCV36	7,59	2,60	6,20	2,80	0,400	C	5542644	5542645
TCF090305DCV36	9,55	2,80	7,80	3,00	0,500	D	5538556	5538557
TCF120405ECV36	12,00	3,40	9,80	3,60	0,500	E	5538606	5538607
TCF150406FCV36	14,94	4,80	12,20	4,20	0,600	F	5542625	5542626
TCF180508GCV36	17,88	6,00	14,60	5,40	0,800	G	5542477	5542478
TCF210608HCV36	21,68	7,50	17,70	6,50	0,800	H	5542004	5542005

NOTE :For application-specific insert selection, please refer to the application data on page C107.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Periphery Inserts • Roughing V36



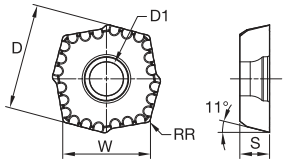
● first choice
○ alternate choice

P	○	●
M	○	●
K	○	●
N		
S		
H		

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040204APV36	4,14	2,10	4,40	2,00	0,400	A	5541844	5541845
TCF050204BPV36	5,07	2,40	5,40	2,40	0,400	B	5542621	5542622
TCF070306CPV36	6,67	2,60	7,10	2,80	0,600	C	5542649	5542650
TCF080308DPV36	8,08	2,80	8,60	3,00	0,800	D	5538601	5538602
TCF100408EPV36	9,96	3,40	10,60	3,60	0,800	E	5538611	5538612
TCF120412FPV36	12,59	4,80	13,40	4,20	1,200	F	5542640	5542641
TCF150512GPV36	15,13	6,00	16,10	5,40	1,200	G	5542603	5542605
TCF180614HPV36	18,04	7,50	19,20	6,50	1,400	H	5542009	5542020

NOTE :For application-specific insert selection, please refer to the application data on page C107.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Center Inserts • Long Chip Materials V38



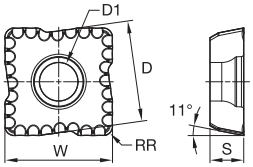
● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	
H	

catalogue number	D	D1	W	S	RR	SSC	WU40PH
TCF040203ACV38	4,47	2,10	3,65	2,00	0,300	A	6429458
TCF060203BCV38	6,00	2,40	4,90	2,40	0,300	B	6429459
TCF070304CCV38	7,59	2,60	6,20	2,80	0,400	C	6429460
TCF090305DCV38	9,55	2,80	7,80	3,00	0,500	D	6429461
TCF120405ECV38	12,00	3,40	9,80	3,60	0,500	E	6429462
TCF150406FCV38	14,94	4,80	12,20	4,20	0,600	F	6429463
TCF180508GCV38	17,88	6,00	14,60	5,40	0,800	G	6324383
TCF210608HCV38	21,68	7,50	17,70	6,50	0,800	H	6429464

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Periphery Inserts • Long Chip Materials V38



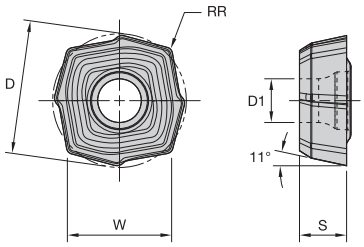
● first choice
○ alternate choice

P	●	●
M	●	●
K	○	○
N		
S		
H		

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040204APV38	4,14	2,10	4,40	2,00	0,400	A	6429424	6429425
TCF050204BPV38	5,07	2,40	5,40	2,40	0,400	B	6429426	6429427
TCF070306CPV38	6,67	2,60	7,10	2,80	0,600	C	6429466	6429428
TCF080308DPV38	8,08	2,80	8,60	3,00	0,800	D	6429429	6429430
TCF100408EPV38	9,96	3,40	10,60	3,60	0,800	E	6429451	6429452
TCF120412FPV38	12,59	4,80	13,40	4,20	1,200	F	6429453	6429454
TCF150512GPV38	15,13	6,00	16,10	5,40	1,200	G	6429455	6324381
TCF180614HPV38	18,04	7,50	19,20	6,50	1,400	H	6429456	6429457

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Center Inserts • Universal DU



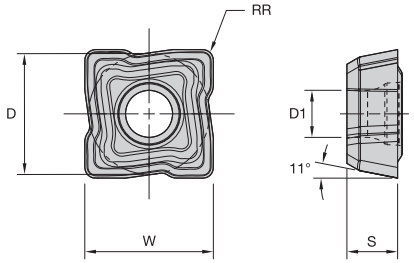
● first choice
○ alternate choice

P	●
M	●
K	●
N	
S	
H	

catalogue number	D	D1	W	S	RR	SSC	WU20PH
TCF070304CCDU	7,59	2,60	6,20	2,80	0,400	C	6858590
TCF090305DCDU	9,55	2,80	7,80	3,00	0,500	D	6858611
TCF120405ECDU	12,00	3,40	9,80	3,60	0,500	E	6858612
TCF150406FCDU	14,94	4,80	12,20	4,20	0,600	F	6858613

NOTE :For application-specific insert selection, please refer to the application data on page C107.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Periphery Inserts • Universal DU



● first choice
○ alternate choice

P	●
M	●
K	●
N	
S	
H	

catalogue number	D	D1	W	S	RR	SSC	WU20PH
TCF070306CPDU	6,67	2,60	7,10	2,80	0,600	C	6858586
TCF080308DPDU	8,08	2,80	8,60	3,00	0,800	D	6858587
TCF100408EPDU	9,96	3,40	10,60	3,60	0,800	E	6858588
TCF120412FPDU	12,59	4,80	13,40	4,20	1,200	F	6858589

NOTE :For application-specific insert selection, please refer to the application data on page C107.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Top Cut 4 • Insert Selection Guide

Material Group	Geometry	Light Machining		General Purpose		Heavy Machining	
		periphery insert	center insert	periphery insert	center insert	periphery insert	center insert
P1	V38/DU	WU25CH	WU40PH/WU20PH	**WU40PH/WU20PH**	**WU40PH/WU20PH**	WU40PH/WU20PH	WU40PH/WU20PH
P2–P4	V34/DU	WPK10CH	WU40PH/WU20PH	**WU25CH/WU20PH**	**WU40PH/WU20PH**	WU40PH/WU20PH	WU40PH/WU20PH
P5–P6	V36/DU	WU25CH	WU40PH/WU20PH	**WU40PH/WU20PH**	**WU40PH/WU20PH**	WU40PH/WU20PH	WU40PH/WU20PH
M1–M3	V36/DU	WU25CH	WU40PH/WU20PH	**WU40PH/WU20PH**	**WU40PH/WU20PH**	WU40PH/WU20PH	WU40PH/WU20PH
K1–K3	V34/DU	WPK10CH	WU40PH/WU20PH	**WU40PH/WU20PH**	**WU40PH/WU20PH**	WU40PH/WU20PH	WU40PH/WU20PH
N1–N4	V36	WN10PH	WN10PH	**WN10PH**	**WN10PH**	WN10PH	WN10PH
S1–S4	V38/DU	WU40PH/WU20PH	WU40PH/WU20PH	**WU40PH/WU20PH**	**WU40PH/WU20PH**	WU40PH/WU20PH	WU40PH/WU20PH

NOTE: All speed conditions are for stable conditions. For unstable conditions, it is suggested to reduce starting speeds by 10%. For interrupted cuts, reduce speed by 20%.
For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above data.
For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above data.
For 5 x D, diameter range 25–68mm (inserts sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above data.
For 4 x D and 5 x D, it is recommended to reduce feed rate during entry and exit by 30–50%.

Top Cut 4 • Cutting Data • Metric

Material Group	Geometry	Grade centre	Grade periphery	Cutting Speed — vc m/min min	Cutting Speed — vc m/min Start	Cutting Speed — vc m/min max	Tool Diameter	Recommended Feed Rate per Revolution 12,00–13,99 Insert Size A	14,00–18,99 Insert Size B	19,00–23,99 Insert Size C	24,00–29,99 Insert Size D
P0	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,06–0,08	0,08–0,11	0,10–0,13	0,11–0,14
	–DU	WU20PH	WU20PH	90	**150**	200	mm/rev	–	–	0,07–0,10	0,08–0,10
P1	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,06–0,10	0,08–0,13	0,10–0,15	0,11–0,16
	–DU	WU20PH	WU20PH	90	**150**	200	mm/rev	–	–	0,07–0,11	0,08–0,11
P2	–V34	WU40PH	WU25CH	120	**190**	280	mm/rev	0,06–0,10	0,08–0,15	0,10–0,16	0,11–0,17
	–DU	WU20PH	WU20PH	90	**150**	220	mm/rev	–	–	0,07–0,12	0,08–0,13
P3	–V34	WU40PH	WPK10CH	120	**200**	310	mm/rev	0,08–0,15	0,10–0,16	0,11–0,18	0,12–0,20
	–DU	WU20PH	WU20PH	90	**160**	220	mm/rev	–	–	0,08–0,13	0,09–0,15
P4	–V34	WU40PH	WPK10CH	120	**190**	310	mm/rev	0,08–0,15	0,10–0,16	0,11–0,18	0,12–0,20
	–DU	WU20PH	WU20PH	90	**150**	220	mm/rev	–	–	0,08–0,13	0,09–0,15
P5	–V36	WU40PH	WU25CH	120	**180**	250	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
	–DU	WU20PH	WU20PH	90	**150**	220	mm/rev	–	–	0,07–0,11	0,08–0,12
P6	-V36	WU40PH	WU25CH	120	**160**	210	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
	–DU	WU20PH	WU20PH	90	**130**	165	mm/rev	–	–	0,07–0,11	0,08–0,12
M1	-V38	WU40PH	WU40PH	120	**160**	240	mm/rev	0,06–0,11	0,07–0,11	0,08–0,12	0,10–0,14
	–DU	WU20PH	WU20PH	90	**130**	190	mm/rev	–	–	0,06–0,09	0,07–0,10
M2	–V38	WU40PH	WU40PH	110	**140**	210	mm/rev	0,06–0,10	0,07–0,11	0,08–0,12	0,10–0,14
	–DU	WU20PH	WU20PH	110	**140**	190	mm/rev	–	–	0,06–0,09	0,07–0,10
M3	-V36	WU40PH	WU40PH	100	**120**	200	mm/rev	0,06–0,10	0,07–0,11	0,08–0,12	0,10–0,14
	–DU	WU20PH	WU20PH	80	**100**	160	mm/rev	–	–	0,06–0,09	0,07–0,10
K1	-V34	WU25CH	WPK10CH	120	**200**	280	mm/rev	0,08–0,14	0,08–0,16	0,10–0,18	0,12–0,24
	–DU	WU20PH	WU20PH	90	**160**	220	mm/rev	–	–	0,07–0,13	0,09–0,18
K2	–V34	WU40PH	WPK10CH	100	**180**	260	mm/rev	0,08–0,14	0,08–0,16	0,10–0,18	0,12–0,24
	–DU	WU20PH	WU20PH	80	**140**	200	mm/rev	–	–	0,07–0,13	0,09–0,18
K3	-V34	WU40PH	WPK10CH	100	**170**	240	mm/rev	0,08–0,14	0,08–0,16	0,10–0,18	0,12–0,24
	–DU	WU20PH	WU20PH	80	**140**	190	mm/rev	–	–	0,07–0,13	0,09–0,18
N1	-V36	WN10PH	WN10PH	250	**350**	500	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
N2	–V36	WN10PH	WN10PH	150	**300**	450	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
N3	-V36	WN10PH	WN10PH	80	**120**	150	mm/rev	0,06–0,10	0,07–0,11	0,08–0,12	0,10–0,14
S3	-V38	WU40PH	WU40PH	20	**30**	45	mm/rev	0,08–0,12	0,08–0,13	0,10–0,15	0,12–0,19
	–DU	WU20PH	WU20PH	20	**30**	40	mm/rev	–	–	0,07–0,11	0,09–0,14
S4	–V38	WU40PH	WU40PH	35	**40**	65	mm/rev	0,08–0,12	0,08–0,13	0,10 –0,15	0,12–0,19
	–DU	WU20PH	WU20PH	30	**40**	60	mm/rev	–	–	0,07–0,11	0,09–0,14

Material Group	Geometry	Grade centre	Grade periphery	Cutting Speed — vc m/min min	Cutting Speed — vc m/min Start	Cutting Speed — vc m/min max	Tool Diameter	30,00–36,99 Insert Size E	37,00–45,99 Insert Size F	46,00–56,99 Insert Size G	57,00–68,00 Insert Size H
P0	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,13–0,16	0,15–0,18	0,16–0,23	0,17–0,24
	–DU	WU20PH	WU20PH	90	**140**	200	mm/rev	0,09–0,12	0,11–0,13	–	–
P1	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,13–0,17	0,15–0,19	0,16–0,24	0,17–0,25
	–DU	WU20PH	WU20PH	90	**140**	200	mm/rev	0,09–0,13	0,11–0,14	–	–
P2	–V34	WU40PH	WU25CH	120	**190**	280	mm/rev	0,13–0,20	0,15–0,21	0,16–0,28	0,17–0,30
	–DU	WU20PH	WU20PH	90	**150**	220	mm/rev	0,09–0,15	0,11–0,15	–	–
P3	–V34	WU40PH	WPK10CH	120	**200**	310	mm/rev	0,16–0,24	0,16–0,24	0,18–0,30	0,19–0,32
	–DU	WU20PH	WU20PH	90	**160**	250	mm/rev	0,12–0,16	0,12–0,18	–	–
P4	–V34	WU40PH	WPK10CH	120	**190**	310	mm/rev	0,14–0,22	0,16–0,24	0,18–0,30	0,19–0,32
	–DU	WU20PH	WU20PH	90	**150**	250	mm/rev	0,12–0,16	0,12–0,18	–	–
P5	–V36	WU40PH	WU25CH	120	**180**	250	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,30
	–DU	WU20PH	WU20PH	90	**140**	200	mm/rev	0,09–0,13	0,11–0,15	–	–
P6	-V36	WU40PH	WU25CH	120	**160**	210	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,29
	–DU	WU20PH	WU20PH	90	**120**	160	mm/rev	0,09–0,13	0,11–0,15	–	–
M1	-V38	WU40PH	WU40PH	120	**160**	240	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
	–DU	WU20PH	WU20PH	90	**120**	190	mm/rev	0,09–0,13	0,10–0,15	–	–
M2	–V38	WU40PH	WU40PH	110	**140**	210	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
	–DU	WU20PH	WU20PH	90	**110**	160	mm/rev	0,09–0,13	0,10–0,15	–	–
M3	-V36	WU40PH	WU40PH	100	**120**	200	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
	–DU	WU20PH	WU20PH	80	**90**	160	mm/rev	0,09–0,13	0,10–0,15	–	–
K1	-V34	WU25CH	WPK10CH	120	**200**	280	mm/rev	0,14–0,26	0,16–0,30	0,18–0,32	0,20–0,36
	–DU	WU20PH	WU20PH	90	**160**	220	mm/rev	0,10–0,19	0,12–0,22	–	–
K2	–V34	WU40PH	WPK10CH	100	**180**	260	mm/rev	0,14–0,26	0,16–0,30	0,18–0,32	0,20–0,36
	–DU	WU20PH	WU20PH	80	**140**	200	mm/rev	0,10–0,19	0,12–0,22	–	–
K3	-V34	WU40PH	WPK10CH	100	**170**	240	mm/rev	0,14–0,26	0,16–0,30	0,18–0,32	0,20–0,36
	–DU	WU20PH	WU20PH	80	**130**	190	mm/rev	0,10–0,19	0,12–0,22	–	–
N1	-V36	WN10PH	WN10PH	250	**350**	500	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,30
N2	–V36	WN10PH	WN10PH	150	**300**	450	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,30
N3	-V36	WN10PH	WN10PH	80	**120**	150	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
S3	-V38	WU40PH	WU40PH	20	**30**	45	mm/rev	0,14–0,21	0,16–0,24	0,18–0,26	0,20–0,30
	–DU	WU20PH	WU20PH	20	**25**	40	mm/rev	0,10–0,15	0,12–0,18	–	–
S4	–V38	WU40PH	WU40PH	35	**40**	65	mm/rev	0,14–0,21	0,16–0,24	0,18–0,26	0,20–0,30
	–DU	WU20PH	WU20PH	30	**35**	50	mm/rev	0,10–0,15	0,12–0,18	–	–

NOTE: All speed conditions are for stable conditions. For unstable conditions, it is suggested to reduce starting speeds by 10%. For interrupted cuts, reduce speed by 20%.
For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above data.
For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above data.
For 5 x D, diameter range 25–68mm (inserts sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above data.
For 4 x D and 5 x D, it is recommended to reduce feed rate during entry and exit by 30–50%.

Top Cut 4 • Drill Depth • X-Offset Capabilities • Hole Tolerance

Insert size	Diameter Range (mm)	2 x D and 3 x D		4 x D		5 x D	
		X-offset value max. in mm	D1 max value	X-offset value max. in mm	D1 max value	X-offset value max.	D1 max value
A	12,00–13,99	0,5	D1 + 1mm	0,5	D1 + 1mm	—	—
B	14,00–18,99	0,5	D1 + 1mm	0,5	D1 + 1mm	—	—
C	19,00–23,99	0,5	D1 + 1mm	0,5	D1 + 1mm	—	—
D	24,00–29,99	0,8	D1 + 1,6mm	0,8	D1 + 1mm	—	—
E	30,00–36,99	0,8	D1 + 1,6mm	0,8	D1 + 1mm	—	—
F	37,00–45,99	0,8	D1 + 1,6mm	0,8	D1 + 1mm	—	—
G	46,00–56,99	1	D1 + 2mm	0,8	D1 + 1mm	—	—
H	57,00–68,00	1	D1 + 2mm	0,8	D1 + 1mm	—	—

NOTE: All speed conditions are for stable conditions. For unstable conditions, it is suggested to reduce starting speeds by 10%. For interrupted cuts, reduce speed by 20%.
For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above data.
For 5 x D, diameter range .473–.938" (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above data.
For 5 x D, diameter range .969–2.5" (inserts sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above data.
For 4 x D and 5 x D, it is recommended to reduce feed rate during entry and exit by 30–50%.

Top Cut 4 • Screw Torque

Insert size	periphery insert	center insert	Torx size	tightening torque Nm
A	**TCF040204AP**	**TCF040203AC**	T5	0,40
B	**TCF050204BP**	**TCF060203BC**	T6	0,53
C	**TCF070306CP**	**TCF070304CC**	T7	0,90
D	**TCF080308DP**	**TCF090305DC**	T8	1,10
E	**TCF100408EP**	**TCF120405EC**	T9	2,00
F	**TCF120412FP**	**TCF150406FC**	T15	4,00
G	**TCF150512GP**	**TCF180508GC**	T20	6,30
H	**TCF180614HP**	**TCF210608HC**	T25	8,80

Application Data • Top Cut 4

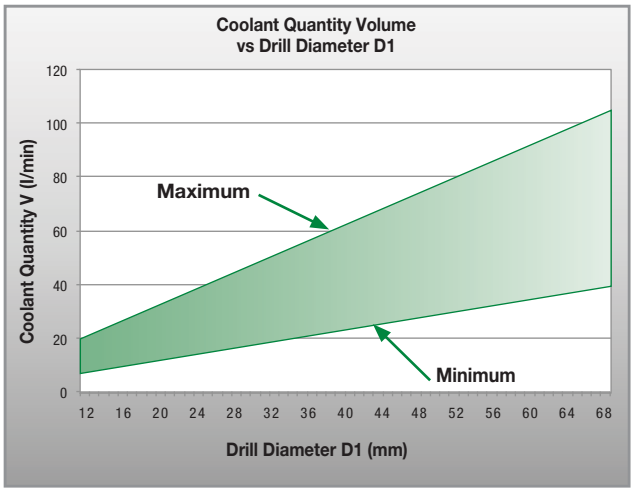
Top Cut 4 • Drill Depth • 2 x D/3 x D • Hole Tolerance Table

Insert size	Diameter Range (mm)	Hole Tolerance (mm)
A	12,00–13,99	+/- 0,20
B	14,00–18,99	+/- 0,20
C	19,00–23,99	+/- 0,20
D	24,00–29,99	+/- 0,20
E	30,00–36,99	+/- 0,20
F	37,00–45,99	+/- 0,25
G	46,00–56,99	+/- 0,25
H	57,00–68,00	+/- 0,28

Top Cut 4 • Drill Depth • 4 x D/5 x D • Hole Tolerance Table

Insert size	Diameter Range (mm)	Hole Tolerance (mm)
A	12,00–13,99	+/- 0,35
B	14,00–18,99	+/- 0,35
C	19,00–23,99	+/- 0,35
D	24,00–29,99	+/- 0,35
E	30,00–36,99	+/- 0,35
F	37,00–45,99	+/- 0,38
G	46,00–56,99	+/- 0,38
H	57,00–68,00	+/- 0,42

Coolant Requirement/Recommendation



widia.com

WIDIA™

HSR™ Reaming Tools combine micrograin substrates, specific coatings, and unequal flutes for highly consistent machining results.

Lapped ground leads for high-speed cutting
Long tool life with increased hole and surface quality

Unequal flute design
Decreased runout and improved straightness

Radial coolant supply for through hole applications and axial coolant supply for blind holes to achieve higher feed rates

Micro-fine grain substrate
Superior wear resistance leading to longer tool life and hole consistency

Improve machining reliability with HSR leads and lapped grinding surface of rake, clearance, and relief angle.

GRADES

K10F

P M K N S

Micro-fine grain carbide, uncoated grade

K10F-DCFD

P M K

PVD TiAlN coated fine grain carbide

RELIABLE PERFORMANCE

PRODUCT

Lapped ground leads for high-speed cutting and long tool life with increased hole and surface quality

DIAMETER RANGE

1,4–32mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

P M K N S

APPLICATIONS

REAMING: THROUGH HOLE

REAMING: BLIND HOLE

REAMING: THROUGH & CROSS HOLES

REAMING: BLIND & CROSS HOLES

THROUGH COOLANT: RADIAL: REAMING

FLOOD COOLANT: REAMING

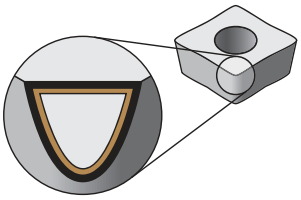
THROUGH COOLANT: AXIAL: REAMING

	DIAMETER RANGE
HSR™ Reamers with Helical Flutes for Through Holes	1,4–10mm
HSR Reamers with Helical Flutes for Through Holes	2–14mm
HSR Tipped Reamers with Helical Flutes for Through Holes	14–32mm
HSR Reamers with Straight Flutes for Blind Holes	2–4mm
HSR Reamers with Straight Flutes for Blind Holes	5–14mm
HSR Tipped Reamers with Straight Flutes for Blind Holes	14–32mm

SHANKS

Round cylindrical

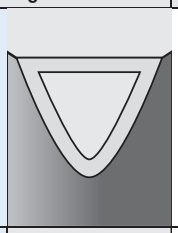
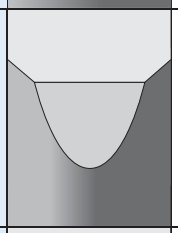
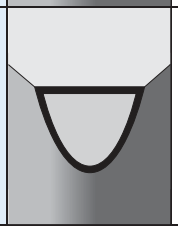
Grades and Grade Descriptions



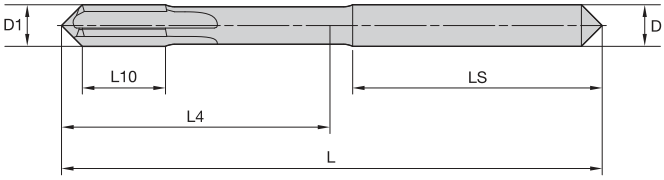
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

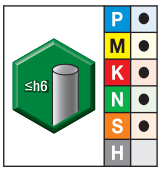
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

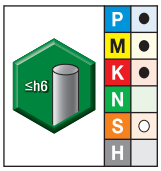
wear resistance ⟷ toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WU05PR		**Composition:** Submicron grain-size tungsten carbide with PVD AlCrN coating for excellent edge retention and wear resistance. **Application:** For use in steel, cast iron, stainless steel, and super alloys.	P		■	■	■					
			M		■	■	■					
			K	■	■	■						
			S		■	■						
K10F		**Composition:** This uncoated fine-grain carbide with high hardness offers excellent abrasive wear resistance paired with excellent toughness for fine-finishing applications. **Application**: First choice for precision reaming of non-ferrous materials.	P					■	■	■	■	
			N		■	■	■	■				
			S			■	■					
K10F-DCFD		**Composition:** With a PVD TiAlN coating and a fine-grain carbide substrate, this grade offers excellent wear resistance paired with excellent toughness for medium-speed fine-finishing applications. **Application**: First choice for precision reaming of steels, stainless steel, and cast irons.	P		■	■	■	■				
			M		■	■	■	■				
			K	■	■	■						

HSR™ Reamers with Straight Flutes for Blind Holes • K10F™/K10F-DCFD™ • 2–4mm



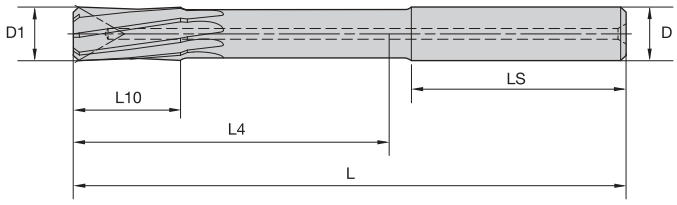


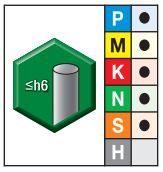


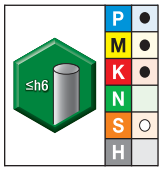
● first choice
○ alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN								
order #	catalogue #	order #	catalogue #	D1	D	L	L4	L10	LS	Z
2446025	050222-000200	2446371	450222-000200	2,00	3,00	48	15	6	28	4
2446029	050222-000300	2446372	450222-000300	3,00	3,00	48	15	8	28	4
2446031	050222-000400	2446415	450222-000400	4,00	4,00	54	21	8	28	4

HSR Reamers with Helical Flutes for Through Holes • K10F™/K10F-DCFD™ • 5–14mm



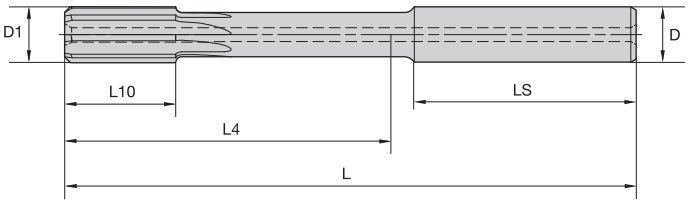


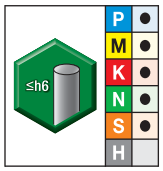


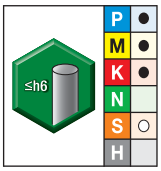
● first choice
○ alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN								
order #	catalogue #	order #	catalogue #	D1	D	L	L4	L10	LS	Z
	–	2441380	450271-000500	5,00	6,00	74	32	12	36	4
	–	2441381	450271-000600	6,00	6,00	74	33	12	36	4
	–	2441453	450271-000800	8,00	8,00	91	50	16	36	6
	–	2441455	450271-001000	10,00	10,00	103	58	20	40	6
2437432	050271-001200	2441457	450271-001200	12,00	12,00	118	68	24	45	6
	–	2441494	450271-001400	14,00	14,00	132	81	28	45	6

HSR™ Reamers with Straight Flutes for Blind Holes • K10F™/K10F-DCFD™ • 5–14mm



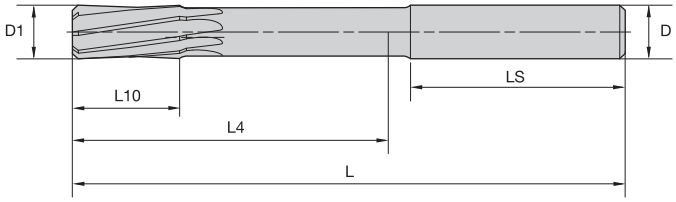


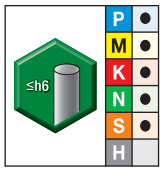


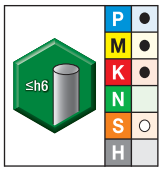
● first choice
○ alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN								
order #	catalogue #	order #	catalogue #	D1	D	L	L4	L10	LS	Z
2437472	050270-000500	2441337	450270-000500	5,00	6,00	74	32	12	36	4
2437523	050270-000600	2441339	450270-000600	6,00	6,00	74	33	12	36	4
2437525	050270-000800	2441341	450270-000800	8,00	8,00	91	50	16	36	6
2437526	050270-001000	2441342	450270-001000	10,00	10,00	103	58	20	40	6
2437527	050270-001200	2441353	450270-001200	12,00	12,00	118	68	24	45	6
2437529	050270-001400	2441354	450270-001400	14,00	14,00	132	81	28	45	6

HSR Reamers with Helical Flutes for Through Holes • K10F™/K10F-DCFD™ • 2–12mm



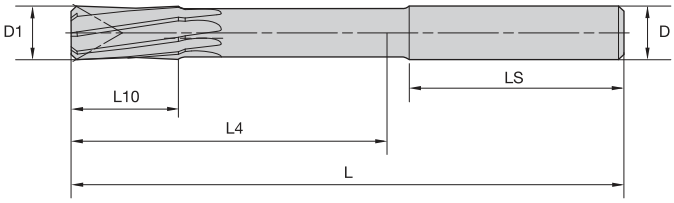


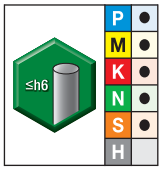


● first choice
○ alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN								
order #	catalogue #	order #	catalogue #	D1	D	L	L4	L10	LS	Z
2436494	050227-000200	2441162	450227-000200	2,00	3,00	48	15	6	28	4
2436871	050227-000300	2441253	450227-000300	3,00	3,00	48	15	6	28	4
–		2441254	450227-000400	4,00	4,00	54	21	8	28	4
–		2441256	450227-000500	5,00	6,00	74	32	12	36	4
2436914	050227-000600	2441257	450227-000600	6,00	6,00	74	33	12	36	4
2436916	050227-000800	2441260	450227-000800	8,00	8,00	91	50	16	36	6
2436919	050227-001000	2441261	450227-001000	10,00	10,00	103	58	20	40	6
2436922	050227-001200	–		12,00	12,00	118	68	24	45	6

GP Reamers for Through Holes • 1,4–10,0mm • Helical Flute • K10 • Uncoated • Cylindrical Shank





● first choice
○ alternate choice

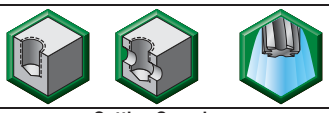
grade K10 uncoated								
order #	catalogue #	D1	D	L	L4	L10	LS	Z
2293637	050221-000015	1,50	1,50	40	18	8	1	3
2293638	050221-000016	1,60	1,60	43	20	9	1	3
2283423	050221-000020	2,00	2,00	49	24	11	1	4
2283424	050221-000022	2,20	2,20	53	26	12	1	4
2283426	050221-000025	2,50	2,50	57	28	14	1	4
2283427	050221-000028	2,80	2,80	61	32	15	1	4
2283428	050221-000030	3,00	3,00	61	32	15	1	6
2283429	050221-000032	3,20	3,20	65	35	16	1	6
2283430	050221-000035	3,50	3,50	70	40	18	1	6
2283431	050221-000040	4,00	4,00	75	41	19	1	6
2293640	050221-000045	4,50	4,50	80	44	21	1	6
2283445	050221-000050	5,00	5,00	86	51	23	1	6
2293642	050221-000060	6,00	5,60	93	53	26	1	6
2293644	050221-000070	7,00	7,10	109	69	31	2	6
2283451	050221-000080	8,00	8,00	117	75	33	2	6
2283464	050221-000090	9,00	9,00	125	81	36	2	6
2283465	050221-000095	9,50	9,00	125	81	36	2	6
2283466	050221-000100	10,00	10,00	133	87	38	2	6

	Reaming Allowances in Diameter		
mm	min	mid	max
1,40–4,80	0,08	0,12	0,20
4,81–9,59	0,10	0,15	0,25
9,60–15,00	0,15	0,20	0,30
15,00–20,00	0,15	0,25	0,35
20,00–50,00	0,20	0,30	0,40

Application Data • Series 050222 • HP Reamers for Blind Holes

Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate per Rev		
		min		max	Tool Diameter	1,40–3,15	3,16–4,80
P	1	30	–	40	mm/r	0,20–0,30	0,20–0,40
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40
	3	30	–	30	mm/r	0,20–0,30	0,20–0,40
	4	20	–	30	mm/r	0,20–0,30	0,20–0,40
	5	10	–	20	mm/r	0,20–0,30	0,20–0,40
	6	10	–	20	mm/r	0,15-0,30	0,20-0,30
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30
	3	10	–	10	mm/r	0,15–0,30	0,20–0,30
K	1	20	–	30	mm/r	0,25–0,45	0,35–0,65
	2	20	–	30	mm/r	0,25–0,45	0,35–0,65
	3	20	–	30	mm/r	0,25–0,45	0,35–0,65
N	1	70	–	90	mm/r	0,25–0,45	0,35–0,65
	2	80	–	100	mm/r	0,25–0,45	0,35–0,65
	3	80	–	100	mm/r	0,25–0,45	0,35–0,65
	4	70	–	90	mm/r	0,25–0,45	0,35–0,65
	5	60	–	80	mm/r	0,25–0,45	0,35–0,65
	6	90	–	110	mm/r	0,25-0,45	0,35-0,65
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30
	2	10	–	10	mm/r	0,10–0,20	0,15–0,30
	3	20	–	30	mm/r	0,15–0,30	0,20–0,30
	4	20	–	30	mm/r	0,15-0,30	0,20-0,30

Application Data • Series 450222 • HP Reamers for Blind Holes



Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate per Rev		
		min		max	Tool Diameter	1,40–3,15	3,16–4,80
P	1	60	–	80	mm/r	0,20–0,30	0,20–0,40
	2	60	–	80	mm/r	0,20–0,30	0,20–0,40
	3	50	–	70	mm/r	0,20–0,30	0,20–0,40
	4	40	–	60	mm/r	0,20–0,30	0,20–0,40
	5	20	–	30	mm/r	0,20–0,30	0,20–0,40
	6	20	–	30	mm/r	0,15–0,30	0,20–0,30
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30
	3	10	–	20	mm/r	0,15–0,30	0,20–0,30
K	1	50	–	70	mm/r	0,25–0,45	0,35–0,65
	2	50	–	70	mm/r	0,25–0,45	0,35–0,65
	3	50	–	70	mm/r	0,25–0,45	0,35–0,65
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30
	2	10	–	20	mm/r	0,10–0,20	0,15–0,30

Application Data • Series 050271 • HP Reamers for Through Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Recommended Feed Rate per Rev Tool Diameter	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	50	–	70	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	2	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	3	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	4	30	–	40	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	5	20	–	30	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	6	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
N	1	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	4	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	5	120	–	140	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	6	150	–	170	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	3	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	4	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65

Application Data • Series 450271 • HP Reamers for Through Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Recommended Feed Rate per Rev Tool Diameter	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	2	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	3	100	–	120	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	4	60	–	80	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	5	30	–	50	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	6	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	70	–	90	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	30	–	40	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50

Application Data • Series 050270 • HP Reamers for Blind Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Tool Diameter	Recommended Feed Rate per Rev 3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	50	–	70	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	2	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	3	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	4	30	–	40	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	5	20	–	30	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	6	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
N	1	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	4	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	5	120	–	140	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	6	150	–	170	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	3	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	4	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65

Application Data • Series 450270 • HP Reamers for Blind Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Tool Diameter	Recommended Feed Rate per Rev 3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	2	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	3	100	–	120	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	4	60	–	80	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	5	30	–	50	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	6	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	70	–	90	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	30	–	40	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50

Application Data • Series 050227 • Reamers for Through Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Tool Diameter	Recommended Feed Rate per Rev 1,40–3,15	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	3	30	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	4	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	5	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	6	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	10	–	10	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	20	–	30	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	20	–	30	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	20	–	30	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
N	1	70	–	90	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	80	–	100	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	80	–	100	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	4	70	–	90	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	5	60	–	80	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	6	90	–	110	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	10	–	10	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	3	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	4	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65

Application Data • Series 450227 • Reamers for Through Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Tool Diameter	Recommended Feed Rate per Rev 1,40–3,15	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	60	–	80	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	2	60	–	80	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	3	60	–	70	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	4	40	–	60	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	5	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	6	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	50	–	70	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	50	–	70	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	50	–	70	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50

Application Data • Series 050221 • GP Reamers for Through Holes

Material Group		Cutting Speed — vc Range — m/min min		max	Tool Diameter	Recommended Feed Rate per Rev 1,40–3,15	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70
P	1	20	–	30	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	2	20	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	3	10	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	4	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	5	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	6	10	–	10	mm/r	0,06–0,10	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23
M	1	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	2	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	3	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
K	1	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	2	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	3	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
N	1	30	–	30	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	2	30	–	40	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	3	30	–	40	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	4	30	–	30	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	5	20	–	30	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
	6	30	–	40	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45
S	1	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	2	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	3	10	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25
	4	10	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25

Pre-Drill Recommendations for Reamers • HSR™, TRF™, and TRM™

Pre-Drill

Leave stock for reamer.
0,2mm (.0079") to 0,4mm (.0156") in diameter.

Run-Out

Runout and angularity are critical.
If possible, use an adjustable holder.
Recommended runout and angularity is 3–5 microns (.00001–.00002").

	Ø, mm					
Material	1–3	3–5	5.1–10	10.1–20	20.1–30	>30
P1	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,4–0,45
P2	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
P3	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
P4	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,4–0,5
P5	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
M1	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
M2	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
M3	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
K1	0,1–0,2	0,1–0,2	0,2	0,3	0,3	0,5
K2	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,4–0,5
K3	0,1–0,2	0,1–0,2	0,2	0,3	0,4	0,5
K4	0,1–0,2	0,1–0,2	0,2	0,3	0,4	0,5
K5	0,1–0,2	0,1–0,2	0,2	0,3	0,4	0,5
N1	0,1–0,2	0,1–0,2	0,2–0,3	0,3–0,4	0,4–0,5	0,5
N2	0,1–0,2	0,1–0,2	0,2–0,3	0,3–0,4	0,4–0,5	0,5
N3	0,1–0,2	0,1–0,2	0,2–0,3	0,2–0,3	0,3	0,5
N4	0,1–0,2	0,1–0,2	0,2–0,3	0,2–0,3	0,3	0,3–0,4
S1	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,4–0,5
S2	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
S3	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,3–0,4
S4	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,3–0,4
S5	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,3–0,4
S6	0,1–0,2	0,1–0,2	0,2	0,2–0,3	0,3–0,4	0,3–0,4
H1	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,25–0,35
H2	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,25–0,35
H3	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,25–0,35
H4	0,1–0,2	0,1–0,2	0,2	0,2	0,3	0,25–0,35

TRM and TRF Reaming Tools combine sub-micron grain substrates and the latest AlCrN PVD coatings, which provide high wear resistance even at elevated speeds and consistency.

Lapped ground leads for high-speed cutting

Long tool life with increased hole and surface quality

Unequal flute spacing

Decreased runout and improved straightness

PVD ALCrN coating

Offers superior wear resistance even at elevated speeds

Sub-micron grain substrate

Superior wear resistance leading to longer tool life and hole consistency

Improving the machining reliability with the HSR leads and lapped grinding surface of rake, clearance, and relief angle.

GRADE

WU05PR

P M K

Sub-micron fine-grain carbide, coated with PVD AlCrN.
Provides superior edge retention and wear resistance.

RELIABLE, CONSISTENT QUALITY AND PERFORMANCE

PRODUCT

Lapped ground leads for high-speed cutting and long tool life with increased hole and surface quality

DIAMETER RANGE

14–42mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

FIRST CHOICE

P M K

SECOND CHOICE

S

APPLICATIONS

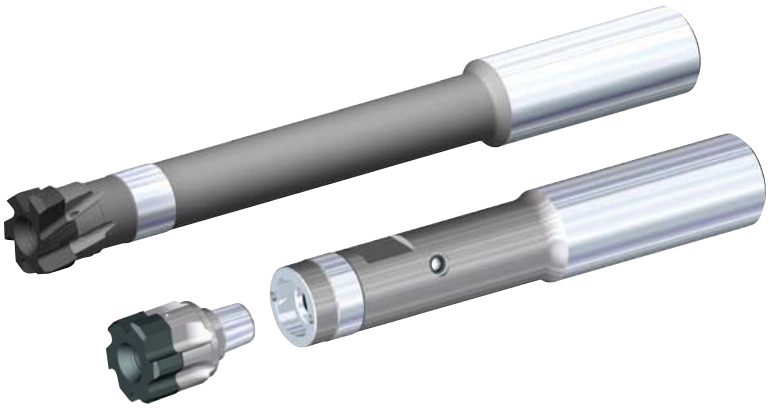
REAMING: THROUGH & CROSS HOLE

REAMING: BLIND & CROSS HOLE

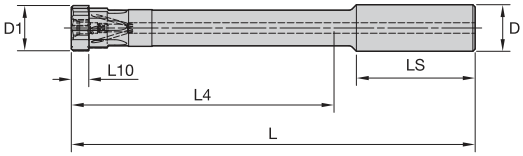
SERIES	STYLE	DIAMETER RANGE
TRF™	Straight	16–40mm
TRF™	Helical	14–40mm
TRM™	Straight	14–42mm
TRM™	Helical	15–41mm

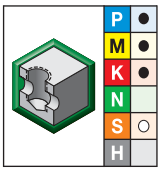
Shank Style

Round cylindrical



TRF™ • Disc Style Reamers • Straight Fluted with Internal Coolant



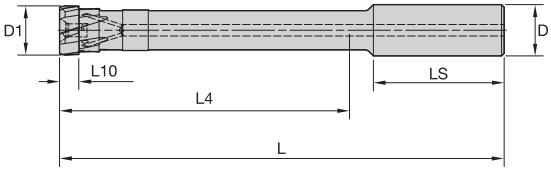


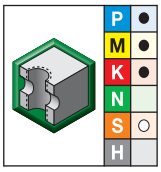
● first choice
○ alternate choice

grade WU05PR
AlCrN

order #	catalogue #	D1	D	L	L4	L10	LS	Z
6055333	TRF16000H7SF	16,00	20,00	159,4	102,4	7,5	51,0	6
6055334	TRF17000H7SF	17,00	20,00	159,4	102,4	7,5	51,0	6
6055335	TRF18000H7SF	18,00	20,00	173,4	116,4	7,5	51,0	6
6055336	TRF19000H7SF	19,00	20,00	173,4	116,4	7,5	51,0	6
6055337	TRF20000H7SF	20,00	20,00	173,4	116,4	7,5	51,0	6
6135130	TRF21000H7SF	21,00	20,00	202,4	145,4	7,5	51,0	6
6135191	TRF22000H7SF	22,00	20,00	202,4	145,4	7,5	51,0	6
6135193	TRF24000H7SF	24,00	20,00	212,4	155,4	7,5	51,0	6
6135194	TRF25000H7SF	25,00	25,00	232,4	169,4	7,5	57,0	8
6135195	TRF26000H7SF	26,00	25,00	232,4	169,4	7,5	57,0	8
6135196	TRF27000H7SF	27,00	25,00	232,4	169,4	7,5	57,0	8
6135199	TRF30000H7SF	30,00	25,00	272,4	209,4	7,5	57,0	8
6135200	TRF31000H7SF	31,00	25,00	272,4	209,4	7,5	57,0	8
6135201	TRF32000H7SF	32,00	25,00	272,4	209,4	7,5	57,0	8
6135209	TRF40000H7SF	40,00	32,00	272,4	205,4	7,5	61,0	8

TRF • Disc Style Reamers • Helical Fluted with Internal Coolant



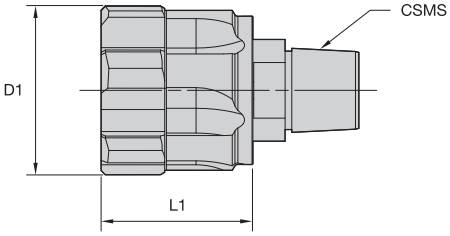


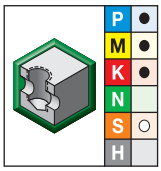
● first choice
○ alternate choice

grade WU05PR
AlCrN

order #	catalogue #	D1	D	L	L4	L10	LS	Z
6055338	TRF14000H7HF	14,00	16,00	147,4	92,4	7,5	49,0	6
6055339	TRF15000H7HF	15,00	16,00	147,4	92,4	7,5	49,0	6
6055340	TRF16000H7HF	16,00	20,00	159,4	102,4	7,5	51,0	6
6055341	TRF17000H7HF	17,00	20,00	159,4	102,4	7,5	51,0	6
6055342	TRF18000H7HF	18,00	20,00	173,4	116,4	7,5	51,0	6
6055344	TRF20000H7HF	20,00	20,00	173,4	116,4	7,5	51,0	6
6135212	TRF21000H7HF	21,00	20,00	202,4	145,4	7,5	51,0	6
6135213	TRF22000H7HF	22,00	20,00	202,4	145,4	7,5	51,0	6
6135214	TRF23000H7HF	23,00	20,00	212,4	155,4	7,5	51,0	6
6135215	TRF24000H7HF	24,00	20,00	212,4	155,4	7,5	51,0	6
6135216	TRF25000H7HF	25,00	25,00	232,4	169,4	7,5	57,0	8
6135218	TRF27000H7HF	27,00	25,00	232,4	169,4	7,5	57,0	8
6135219	TRF28000H7HF	28,00	25,00	242,4	179,4	7,5	57,0	8
6135221	TRF30000H7HF	30,00	25,00	272,4	209,4	7,5	57,0	8
6135223	TRF32000H7HF	32,00	25,00	272,4	209,4	7,5	57,0	8
6135226	TRF35000H7HF	35,00	32,00	272,4	205,4	7,5	61,0	8
6135229	TRF38000H7HF	38,00	32,00	272,4	205,4	7,5	61,0	8
6135231	TRF40000H7HF	40,00	32,00	272,4	205,4	7,5	61,0	8

TRM™ Disc Style Modular Reamer Heads • Blind Holes

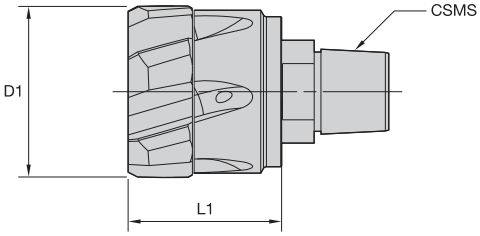


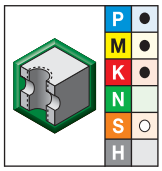


● first choice
○ alternate choice

grade WU05PR AlCrN order #	catalogue #	CSMS system size	D1	L1	Z
6447321	TRM14000WST115H7SF	KST115	14,00	17,90	6
6447323	TRM15000WST115H7SF	KST115	15,00	17,90	6
6447327	TRM17000WST135H7SF	KST135	17,00	17,90	6
6447329	TRM18000WST155H7SF	KST155	18,00	17,90	6
6447342	TRM20000WST175H7SF	KST175	20,00	17,90	6
6447344	TRM21000WST175H7SF	KST175	21,00	17,90	6
6447346	TRM22000WST175H7SF	KST175	22,00	17,90	6
6447348	TRM23000WST200H7SF	KST200	23,00	18,90	6
6447361	TRM25000WST200H7SF	KST200	25,00	18,90	8
6447365	TRM27000WST200H7SF	KST200	27,00	18,90	8
6447367	TRM28000WST250H7SF	KST250	28,00	18,90	8
6447369	TRM29000WST250H7SF	KST250	29,00	18,90	8
6447371	TRM30000WST250H7SF	KST250	30,00	18,90	8
6447373	TRM31000WST250H7SF	KST250	31,00	18,90	8
6447377	TRM33000WST300H7SF	KST300	33,00	20,40	8
6447379	TRM34000WST300H7SF	KST300	34,00	20,40	8
6447381	TRM35000WST300H7SF	KST300	35,00	20,40	8
6175690	TRM36000WST300H7SF	KST300	36,00	20,40	8
6447384	TRM37000WST300H7SF	KST300	37,00	20,40	8
6447386	TRM38000WST350H7SF	KST350	38,00	20,40	8
6447388	TRM39000WST350H7SF	KST350	39,00	20,40	8
6447390	TRM40000WST350H7SF	KST350	40,00	20,40	8
6447392	TRM41000WST350H7SF	KST350	41,00	20,40	8
6447393	TRM42000WST350H7SF	KST350	42,00	20,40	8

TRM™ Disc Style Modular Reamer Heads • Through Holes

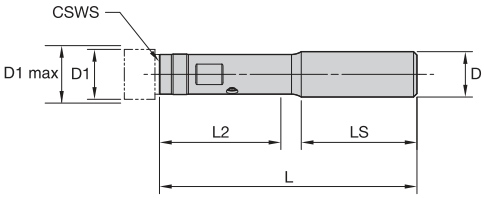




● first choice
○ alternate choice

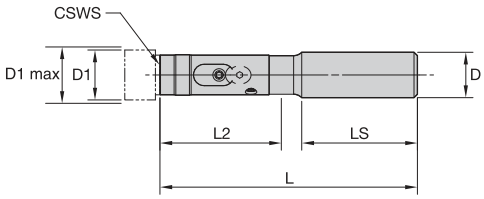
grade WU05PR AlCrN order #	catalogue #	CSMS system size	D1	L1	Z
6447322	TRM15000WST115H7HF	KST115	15,00	17,90	6
6447326	TRM17000WST135H7HF	KST135	17,00	17,90	6
6447328	TRM18000WST155H7HF	KST155	18,00	17,90	6
6447330	TRM19000WST155H7HF	KST155	19,00	17,90	6
6393172	TRM20000WST175H7HF	KST175	20,00	17,90	6
6447343	TRM21000WST175H7HF	KST175	21,00	17,90	6
6447345	TRM22000WST175H7HF	KST175	22,00	17,90	6
6447347	TRM23000WST200H7HF	KST200	23,00	18,90	6
6447349	TRM24000WST200H7HF	KST200	24,00	18,90	6
6205150	TRM25000WST200H7HF	KST200	25,00	18,90	8
6447362	TRM26000WST200H7HF	KST200	26,00	18,90	8
6447364	TRM27000WST200H7HF	KST200	27,00	18,90	8
6447368	TRM29000WST250H7HF	KST250	29,00	18,90	8
6447372	TRM31000WST250H7HF	KST250	31,00	18,90	8
6447374	TRM32000WST250H7HF	KST250	32,00	18,90	8
6447376	TRM33000WST300H7HF	KST300	33,00	20,40	8
6447380	TRM35000WST300H7HF	KST300	35,00	20,40	8
6447382	TRM36000WST300H7HF	KST300	36,00	20,40	8
6447385	TRM38000WST350H7HF	KST350	38,00	20,40	8
6447389	TRM40000WST350H7HF	KST350	40,00	20,40	8
6447391	TRM41000WST350H7HF	KST350	41,00	20,40	8

Straight Shank Bodies • Axial Clamping • 3 x D



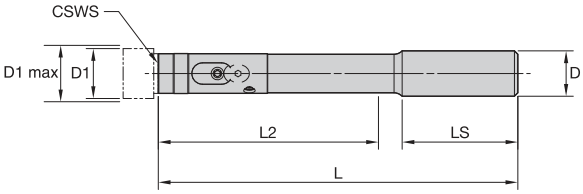
order number	catalogue number	CSWS system size	D1	D1 max	D	L	L2	LS	kg	lbs
6338199	SS16WST115AR3M	KST115	14,00	15,999	16,00	91,00	35,00	48,00	0,1	.3
6311901	SS20WST155AR3M	KST155	18,00	19,999	20,00	106,00	45,00	51,00	0,2	.5

Straight Shank • Radial Clamping • 3 x D



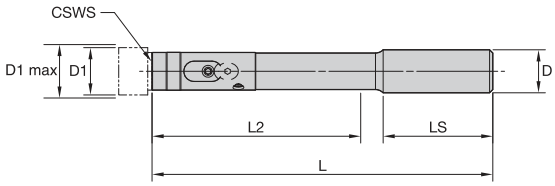
order number	catalogue number	CSWS system size	D1	D1 max	D	L	L2	LS
6055345	SS20WST175RR3M	KST175	20,00	22,499	20,00	113,50	51,50	51,00
6055347	SS20WST200RR3M	KST200	22,50	27,499	20,00	130,50	65,50	51,00
6055349	SS25WST250RR3M	KST250	27,50	32,499	25,00	152,50	80,50	56,00
6055351	SS32WST300RR3M	KST300	32,50	37,499	32,00	174,00	94,00	61,00
6055353	SS32WST350RR3M	KST350	37,50	42,000	32,00	190,00	108,00	61,00

Straight Shank Bodies • Axial Clamping • 5 x D



order number	catalogue number	CSWS system size	D1	D1 max	D	L	L2	LS	kg	lbs
6433752	SS16WST115AR5M	KST115	14,00	15,999	16,00	123,00	67,00	48,00	0,1	.3
6433754	SS20WST155AR5M	KST155	18,00	19,999	20,00	146,00	85,00	51,00	0,2	.5

Straight Shank • Radial Clamping • 5 x D



order number	catalogue number	CSWS system size	D1	D1 max	D	L	L2	LS
6055346	SS20WST175RR5M	KST175	20,00	22,499	20,00	158,50	96,50	51,00
6055348	SS20WST200RR5M	KST200	22,50	27,499	20,00	185,50	120,50	51,00
6055350	SS25WST250RR5M	KST250	27,50	32,499	25,00	217,50	145,50	56,00
6055352	SS32WST300RR5M	KST300	32,50	37,499	32,00	249,00	169,00	61,00
6055354	SS32WST350RR5M	KST350	37,50	42,000	32,00	274,00	192,00	61,00

Application Data • TRM™ • WU05PR • Metric

Material Group		WU05-PR			Metric						
		Cutting Speed — vc			Recommended Feed Rate per Tooth						
		Range — m/min			Tool Diameter (mm)	14,00–19,99mm		20,00–32,00mm		32,50–42,00mm	
		min	Starting Value	max	Feed/Tooth	min	max	min	max	min	max
P	1	90	120	155	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	2	90	120	155	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	3	75	100	130	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	4	50	80	105	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	5	30	40	60	mm/z	0,08	0,18	0,08	0,20	0,08	0,22
	6	30	40	60	mm/z	0,08	0,18	0,08	0,20	0,08	0,22
M	1	15	20	40	mm/z	0,08	0,15	0,08	0,18	0,08	0,20
	2	15	20	30	mm/z	0,08	0,15	0,08	0,18	0,08	0,20
	3	15	20	30	mm/z	0,08	0,15	0,08	0,18	0,08	0,20
K	1	80	110	130	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	2	65	90	110	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	3	50	70	90	mm/z	0,10	0,18	0,10	0,20	0,10	0,22
S	1	15	20	30	mm/z	0,06	0,15	0,10	0,18	0,10	0,20
	2	15	20	30	mm/z	0,06	0,15	0,10	0,18	0,10	0,20
	3	20	30	40	mm/z	0,08	0,18	0,10	0,20	0,10	0,20
	4	20	30	40	mm/z	0,08	0,18	0,10	0,20	0,10	0,20

Application Data • TRF™ • WU05PR • Metric

Material Group		WU05-PR			Metric				
		Cutting Speed — vc			Recommended Feed Rate per Tooth				
		Range — m/min			Tool Diameter (mm)	14,00–19,99mm		20,00–32,00mm	
		min	Starting Value	max	Feed/Tooth	min	max	min	max
P	1	90	120	155	mm/z	0,10	0,22	0,10	0,25
	2	90	120	155	mm/z	0,10	0,22	0,10	0,25
	3	75	100	130	mm/z	0,10	0,22	0,10	0,25
	4	50	80	105	mm/z	0,10	0,22	0,10	0,25
	5	30	40	60	mm/z	0,10	0,22	0,10	0,25
	6	30	40	60	mm/z	0,08	0,20	0,08	0,22
M	1	15	20	40	mm/z	0,08	0,18	0,08	0,20
	2	15	20	30	mm/z	0,08	0,18	0,08	0,20
	3	15	20	30	mm/z	0,08	0,18	0,08	0,20
K	1	80	110	130	mm/z	0,10	0,22	0,10	0,25
	2	65	90	110	mm/z	0,10	0,22	0,10	0,25
	3	50	70	90	mm/z	0,10	0,20	0,10	0,25
S	1	15	20	30	mm/z	0,10	0,18	0,10	0,20
	2	15	20	30	mm/z	0,10	0,18	0,10	0,20
	3	20	30	40	mm/z	0,10	0,20	0,10	0,20
	4	20	30	40	mm/z	0,10	0,20	0,10	0,20

TRM™ Assembly

Assembling

1 Assembling reamer head

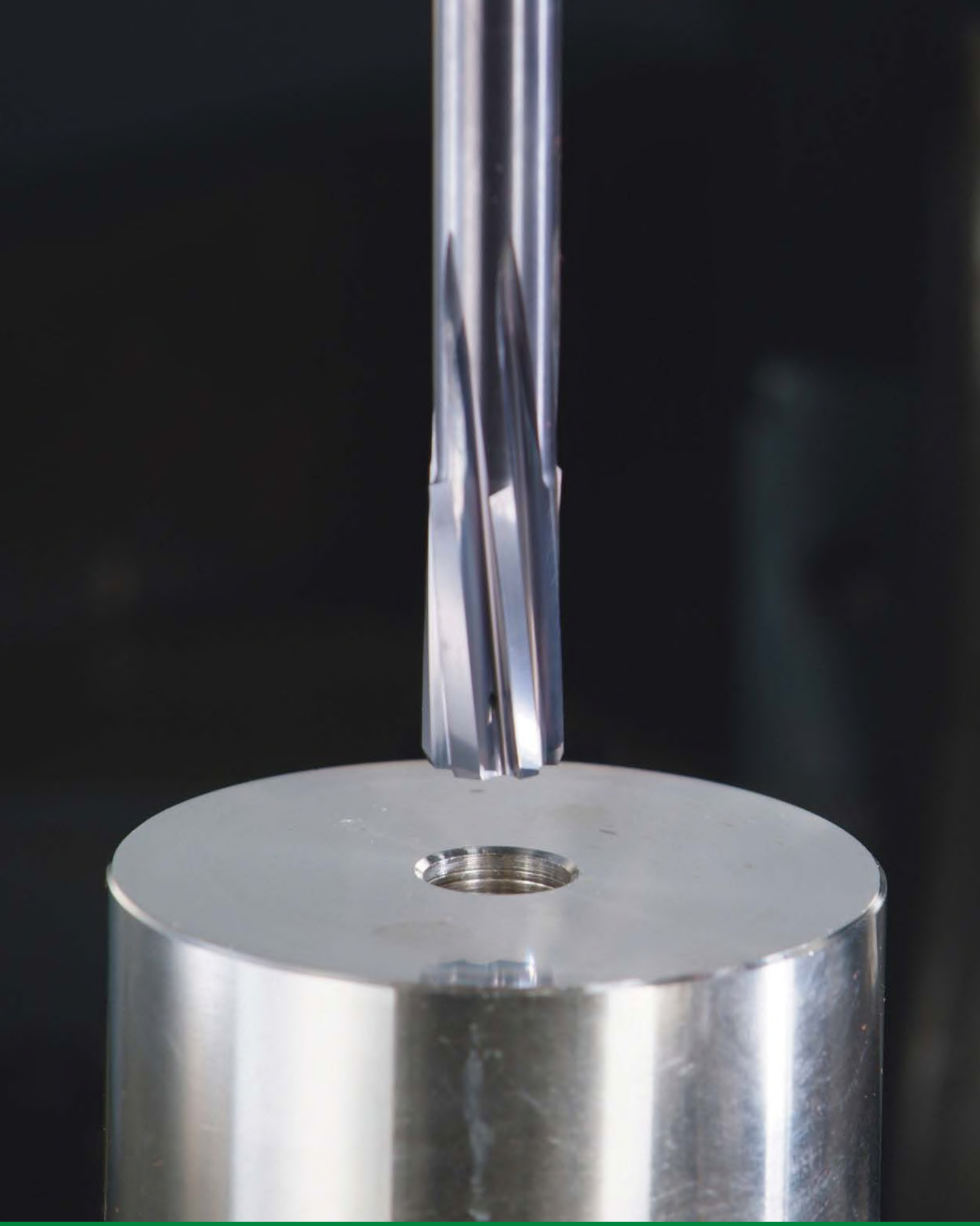
2 Place reamer head in reamer body

3 Clamp reamer head in reamer body

WST	Ø Range [mm]		Mt [Nm]	Torx size
175	20.000	22.499	5	TT–15
200	22.500	27.499	5	TT–15
250	27.500	32.499	9	TT–25
300	32.500	37.499	13	TT–30
350	37.500	42.000	13	TT–30

Disassembing

Reverse order [3, 2, 1]



widia.com

WIDIA™

eBore™

Digital Fine Boring System

The eBore boring system covers a diameter range from 6–1020mm by providing state-of-the-art fine boring tooling solutions that have one thing in common: all of them are digital ready.

The digital eBore display enables the tool to be readjusted on the spindle, reducing setup time and idle time. **One for all — One eBore digital display serving all eBore fine boring tools.**

Micron by micron, the precision adjustment of each tool is as easy as 1, 2, 3.

CONSISTENT PERFORMANCE

PRODUCT

ONE FOR ALL
One eBore™ digital display serving all eBore fine boring tools.

DIAMETER RANGE

6–1020mm

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

P M K N S H

APPLICATIONS

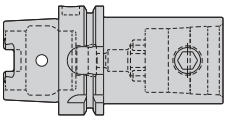
REAMING: THROUGH HOLE

REAMING: BLIND HOLE

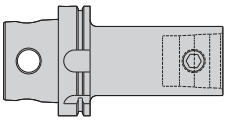
REAMING: THROUGH & CROSS HOLES

REAMING: BLIND & CROSS HOLES

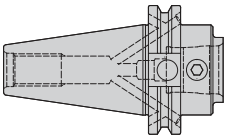
ADAPTERS



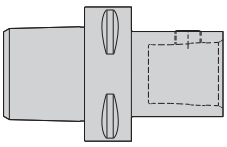
HSK to KM™



KM4X™ to KM

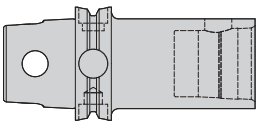


BT, CV, DV to KM

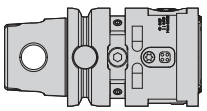


PSC to KM

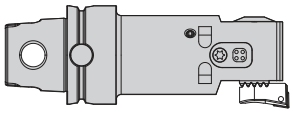
EXTENSION



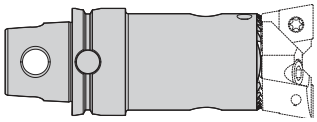
eBore



eBore Universal

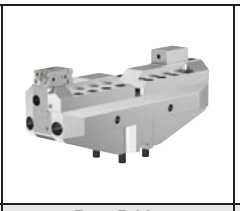
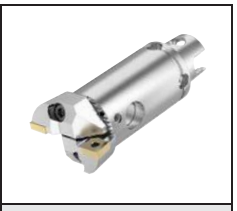


eBore Fine Boring



eBore Twin Cutter

Tool Selection Guide • Fine Boring

				
Series	eBore™ Universal	eBore Fine Boring Tool	eBore Bridge Finishing Tools	eBore Twin Cutters
Page	C140	C146	C148	C151
Workpiece material				
Primary	P M K N S	P M K N S	P M K N S	P M K N S
Secondary	H	H	H	
Boring range [BR1]	6–152mm	20–205mm	200–1020mm	19,5–1020mm
Accuracy	IT6			IT9
Cylindricity	5 µm			10 µm
Position	5–10 µm			>20 µm
Surface roughness (Ra) P	0,8–2,0 µm			1,0–5,0 µm
Surface roughness (Ra) M	0,8–2,0 µm			1,0–5,0 µm
Surface roughness (Ra) K	0,8–2,0 µm			1,0–5,0 µm
Surface roughness (Ra) N	0,8–2,0 µm			1,0–2,0 µm
Surface roughness (Ra) S	0,8–2,0 µm			1,0–5,0 µm
Surface roughness (Ra) H	< 1,2 µm			
Coolant				
Main Operations				

NOVO

TO SEE ALL PRODUCT LINES,
VISIT OUR DIGITAL RESOURCES
widia.com or widianovo.com

eBore™ • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

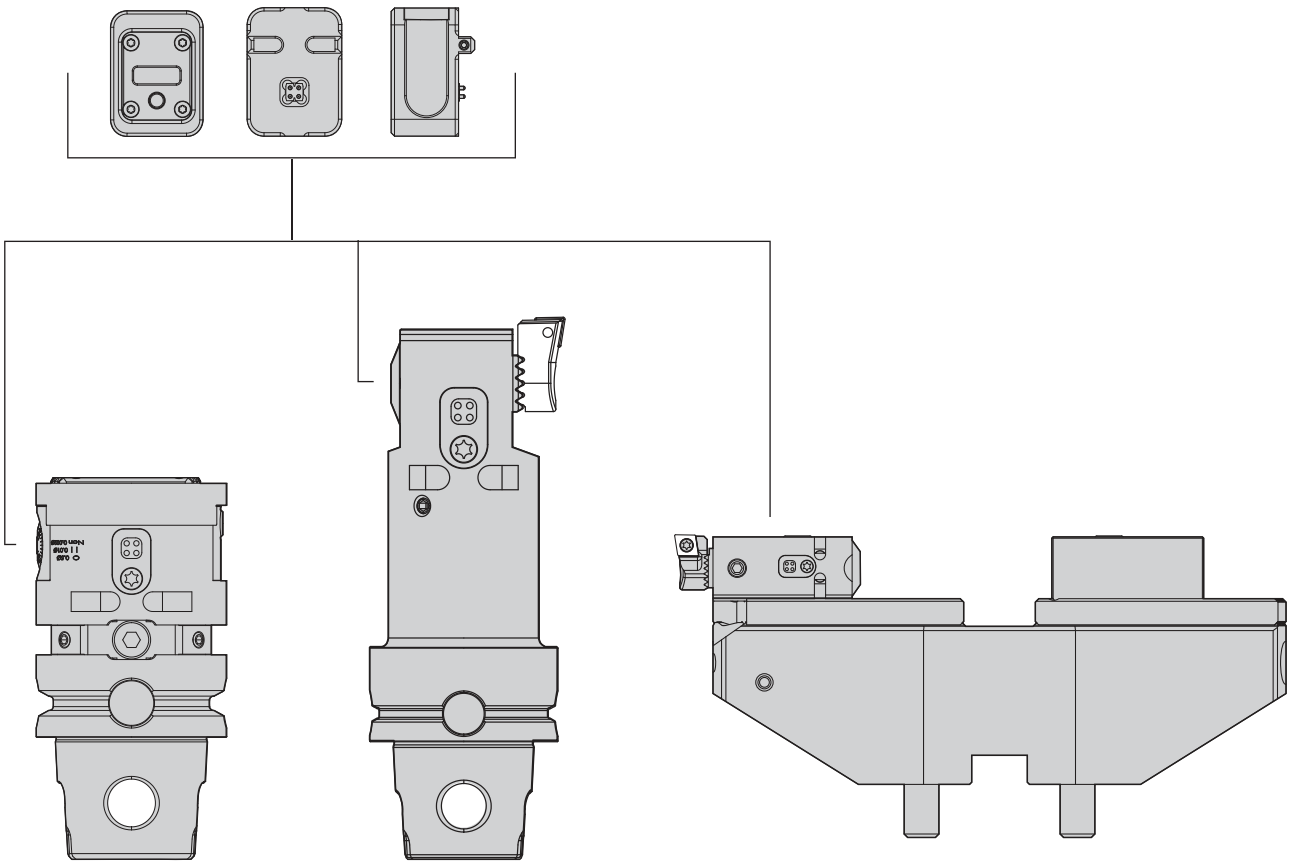
Head

KM50	UFT	152
Back End	Boring System	Boring Range
KM™	**UTF** = Universal Fine Boring Tool **BT** = Fine Boring Tool **BDG** = Bridge Tool **TC** = Twin Cutter	Diameter (min. or max.)

Boring Bar and Insert Holder

BB	14	50	CC06
Tool Type	Diameter	Length	Insert Style and Size
BB = Boring bar **IH** = Insert holder	Ø14mm	50mm	**CC** = Rhomboid 60º, 7º clearance angle **06** = IC 6mm **09** = IC 9mm **12** = IC 12mm

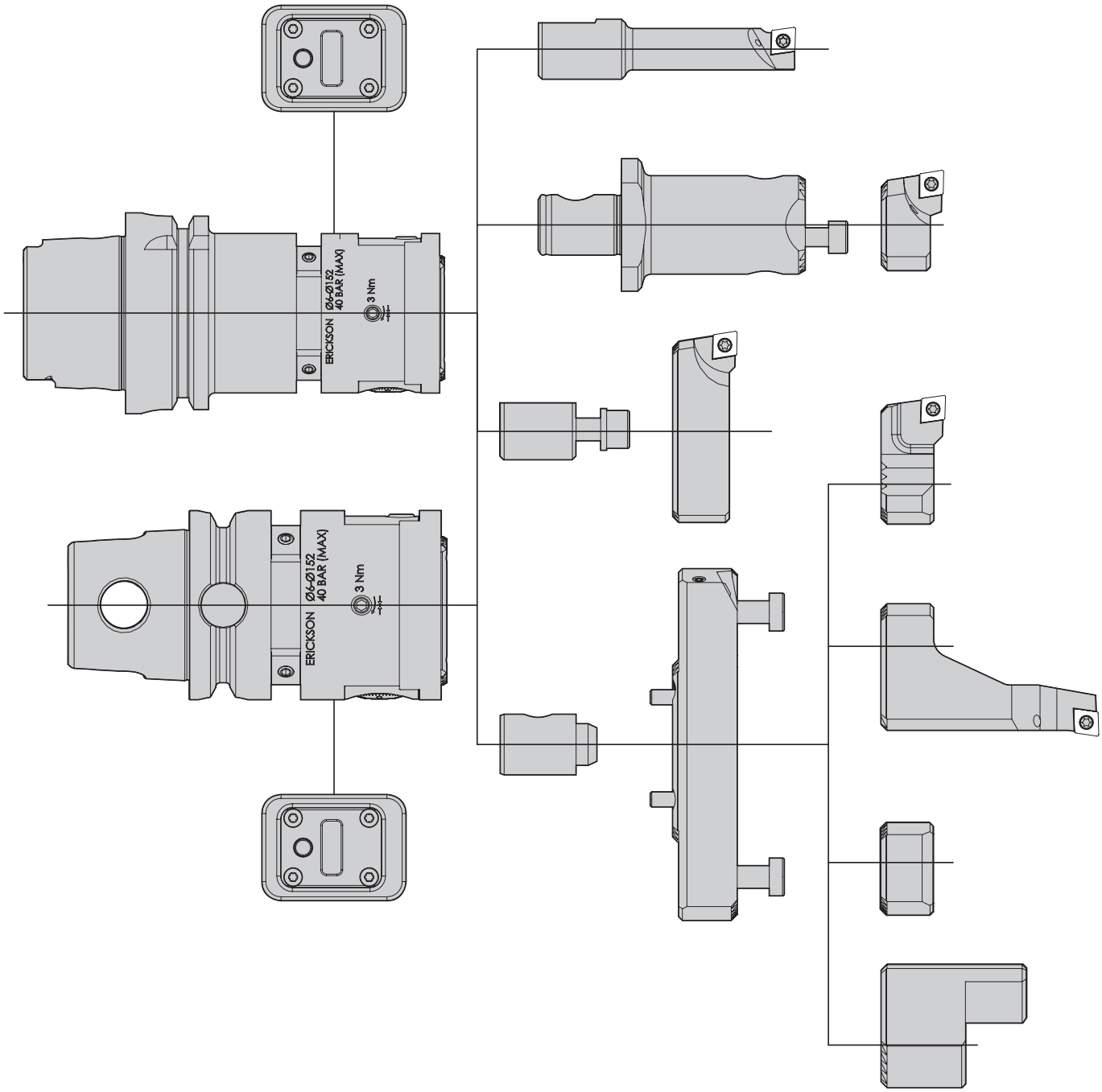
eBore™ Digital Display Overview



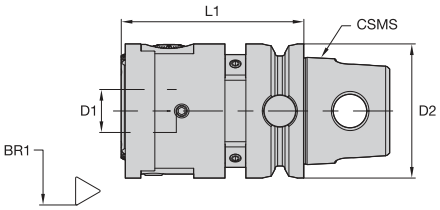
eBore Digital Display

order number	catalogue number
6655307	FBDD0001IN
6655306	FBDD0001M

eBore™ Universal Overview

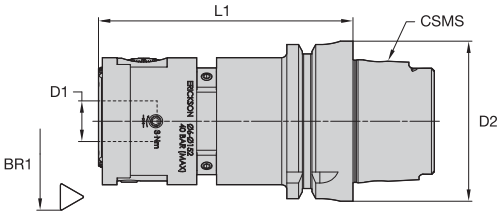


eBore™ • Universal • Head • KM™



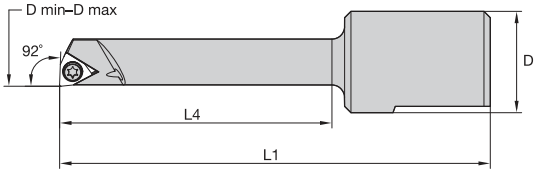
order number	catalogue number	BR1	CSMS	D1	D2	L1
6655201	**KM50UFT152**	6,0000-152,0000	KM50TS	16,0	50,0	68,0

eBore • Universal • Head • HSK63A



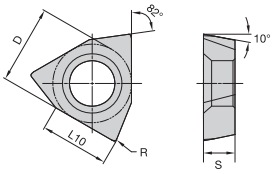
order number	catalogue number	BR1	CSMS	D1	D2	L1
6922550	**HSK63AUFT152**	6,0000-152,0000	HSK63A	16,0	50,0	100,0

eBore™ Universal • Boring Bar • Heavy Metal



order number	catalogue number	D min	D max	D	L1	L4
6655221	BB0632WBGX02	6,0	8,0	16,0	55,0	30,0
6655222	BB0845WBGX02	8,0	10,0	16,0	68,0	43,0

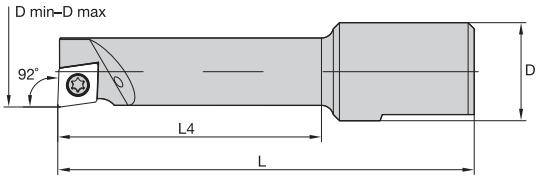
eBore Universal • Boring Bar • Heavy Metal • Insert



● first choice
○ alternate choice

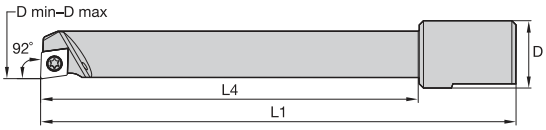
ISO catalogue number	D	L10	Rε	KCU10
WBGX020101	3,97	3,45	0,1	6826761

eBore Universal • Boring Bar • Steel



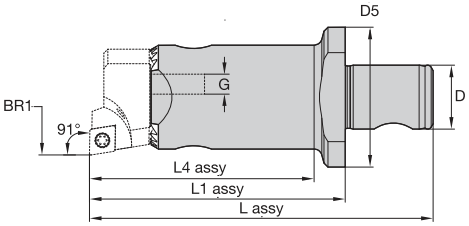
order number	catalogue number	D min	D max	D	L	L4
6655202	BB0622WBGX02	6,0	8,0	16,0	45,0	20,0
6655203	BB0830WBGX02	8,0	10,0	16,0	53,0	28,0
6655204	BB1025CC06	10,0	12,0	16,0	48,0	23,0
6655205	BB1035CC06	10,0	12,0	16,0	58,0	33,0
6655206	BB1230CC06	12,0	14,0	16,0	53,0	28,0
6655207	BB1245CC06	12,0	14,0	16,0	68,0	43,0
6655208	BB1435CC06	14,0	16,0	16,0	58,0	34,0
6655209	BB1450CC06	14,0	16,0	16,0	73,0	48,4
6655210	BB1560CC06	15,0	20,0	16,0	83,0	57,8
6655211	BB1640CC06	16,0	20,0	16,0	63,0	40,0
6655212	BB2070CC06	20,0	25,0	16,0	93,0	70,0
6655213	BB2570CC06	25,0	30,0	16,0	93,0	70,0

eBore™ Universal • Boring Bar • Carbide



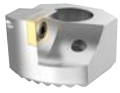
order number	catalogue number	D min	D max	D	L1	L4
6655214	BB1055CC06	10,0	12,0	16,0	78,0	55,0
6655215	BB1075CC06	10,0	12,0	16,0	98,0	75,0
6655216	BB1290CC06	12,0	14,0	16,0	113,0	90,0
6655217	BB1475CC06	14,0	16,0	16,0	98,0	75,0
6655218	BB14100CC06	14,0	16,0	16,0	123,0	100,0
6655219	BB1690CC06	16,0	20,0	16,0	113,0	90,0
6655220	BB16120CC06	16,0	20,0	16,0	143,0	120,0

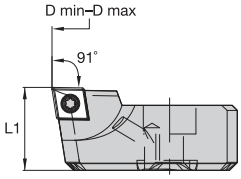
eBore Universal • Extension



order number	catalogue number	BR1	D	D5	L1 assy	L2 assy	G
6655223	UFTE64	29,0000-53,0000	16,0	35,0	64,0	56,2	M5X20
6655224	UFTE100	29,0000-53,0000	16,0	35,0	100,0	92,2	M5X20

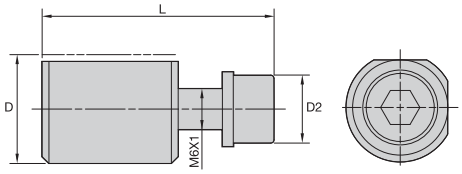
eBore Universal • Insert Holder for Extension • CC06





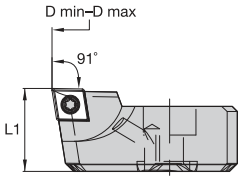
order number	catalogue number	D min	D max	L1
6655226	IH02916CC06	29,0	41,0	16,0
6655227	IH04016CC06	40,0	53,0	16,0

eBore Universal • Mounting Bolt for Insert Holder Straight Mount



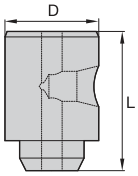
order number	catalogue number	D	D2	L
6655231	WIH052076	16,0	11,00	34,10

eBore™ Universal • Insert Holder for Straight Mount • CC06



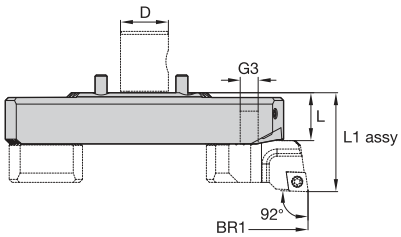
order number	catalogue number	D min	D max	L1
6655228	IH05216CC06	52,0	77,0	16,5
6655229	IH07616CC06	76,0	102,0	16,5

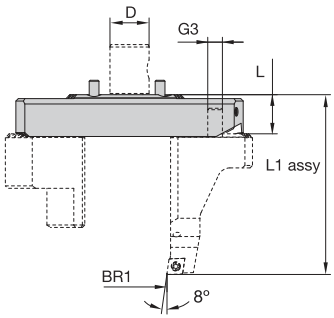
eBore Universal • Coolant Connector



order number	catalogue number	D	L
6655238	CBUFTB	16,0	25,5

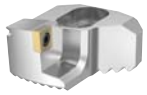
eBore Universal • Bridge for Insert Holder I.D./O.D.

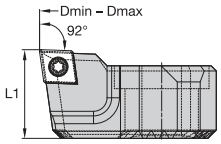




order number	catalogue number	BR1 - I.D.	BR1 - O.D.	D	L	L1 assy - I.D.	L1 assy - O.D.	G3
6655233	UFTB06816	68,0000-96,0000	—	16,0	17,1	32,5	—	M4X0.7
6655234	UFTB09616	96,0000-124,0000	2,0000 - 30,0000	16,0	17,1	32,5	75,1	M4X0.7
6655235	UFTB12416	124,0000-152,0000	29,0000 - 58,0000	16,0	17,1	32,5	75,1	M4X0.7

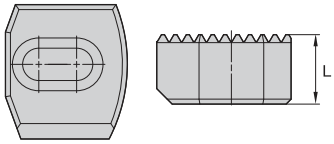
eBore™ Universal • Insert Holder I.D. • CC06





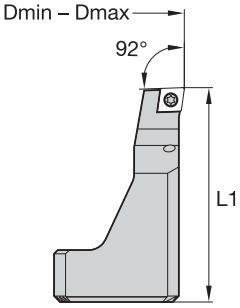
order number	catalogue number	D min	D max	L1
6655236	IHUFTBCC06	68,0	152,0	16,5

eBore Universal • Counterweight I.D.



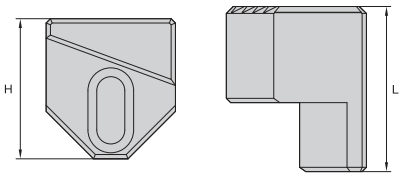
order number	catalogue number	L
6655237	CWUFTB	14,0

eBore Universal • Insert Holder O.D. • CC06



order number	catalogue number	D min	D max	L1
6655308	IHUFTODCC06	2,0	58,0	57,0

eBore™ Universal • Counterweight O.D.

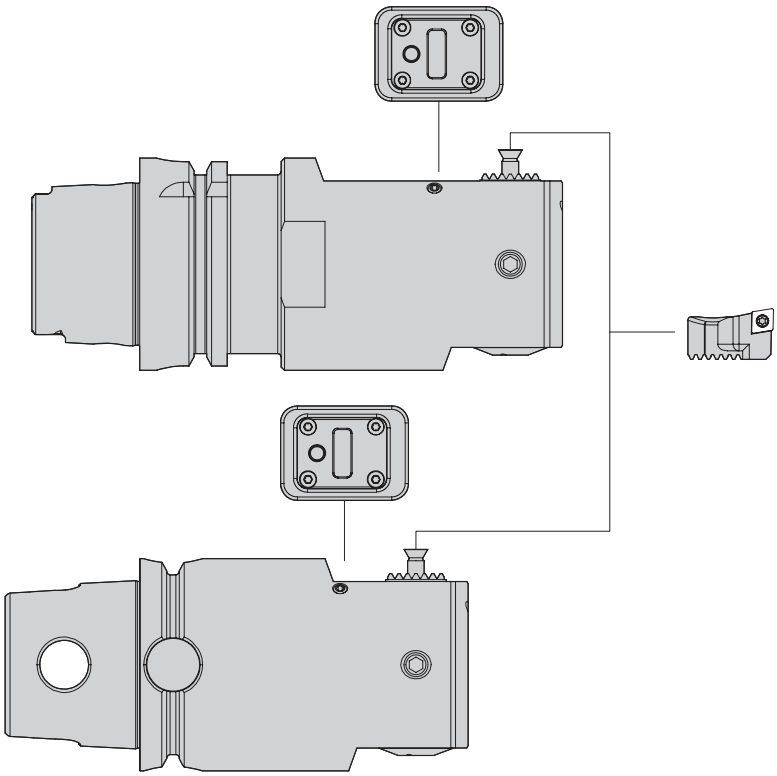


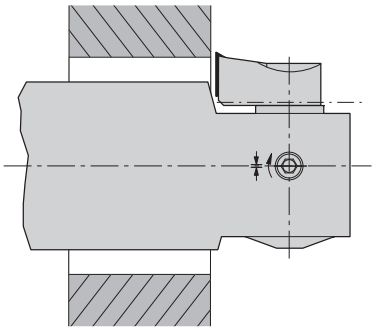
order number	catalogue number	L	H
6655309	CWUFTBOD	38,3	32,5

eBore Universal • Balancing Weight

order number	catalogue number
6655232	BW536005

eBore™ Fine Boring Overview



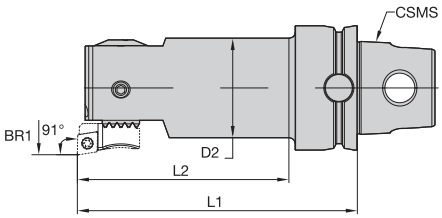


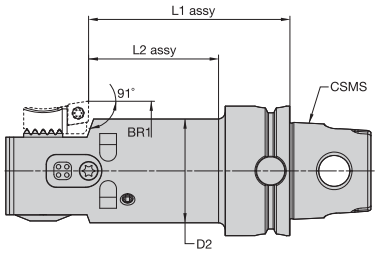
Back boring feasible with identical cartridge

For back boring, the insert holder is turned through 180° and mounted on the slider.

Attention: Back boring then takes place with the machine spindle rotating counterclockwise.

eBore Fine Boring • Cutting Unit • KM™

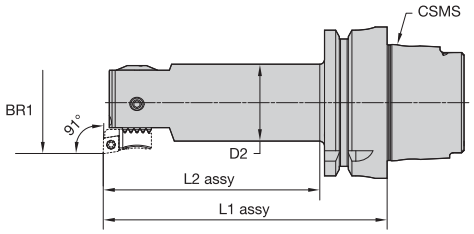


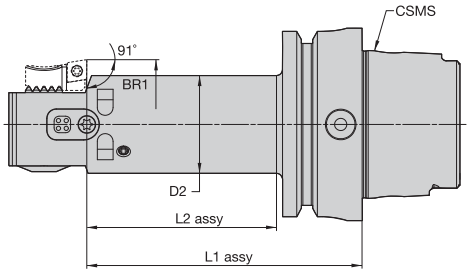


Back boring (BB)

order number	catalogue number	BR1	CSMS	D2	L1 assy	L2 assy	L1 assy BB	L2 assy BB	IHS
6655290	**KM32BT024532**	24,5000-29,0000	KM32TS	23,0	90,0	78,0	—	—	A
6655292	**KM32BT02942**	29,0000-44,0000	KM32TS	27,0	100,0	88,0	72,0	60,0	A / B
6655294	**KM40BT04352**	43,0000-54,0000	KM40TS	32,0	90,0	68,0	62,0	40,0	B
6655295	**KM50BT05357**	53,0000-66,0000	KM50TS	42,0	86,0	68,0	58,0	36,0	B
6655297	**KM50BT06557**	65,0000-83,0000	KM50TS	50,0	90,0	90,0	54,0	32,0	C
6655298	**KM63BT08272**	82,0000-103,0000	KM63TS	63,0	100,0	100,0	64,0	42,0	C
6655299	**KM80BT10072**	100,0000-130,0000	KM80TS	80,0	120,0	120,0	84,0	62,0	C
6655300	**KM80BT12572**	125,0000-167,5000	KM80TS	100,0	120,0	120,0	84,0	62,0	C
6655301	**KM80BT162572**	162,5000-205,0000	KM80TS	135,0	150,0	150,0	114,0	92,0	C

eBore™ Fine Boring • Cutting Unit • HSK63A

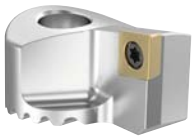


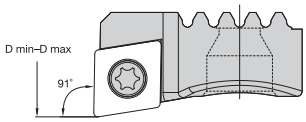


Back boring (BB)

order number	catalogue number	BR1	CSMS	D2	L1 assy	L2 assy	L1 assy BB	L2 assy BB	IHS
6922551	HSK63ABT024580	24,5000-29,0000	HSK63A	23,0	108,0	82,0	–	–	A
6922552	HSK63ABT02990	29,0000-44,0000	HSK63A	27,0	118,0	92,0	90,0	62,0	A / B
6922553	HSK63ABT04390	43,0000-54,0000	HSK63A	32,0	118,0	92,0	90,0	62,0	B
6922554	HSK63ABT053100	53,0000-66,0000	HSK63A	42,0	128,0	102,0	100,0	72,0	B
6922555	HSK63ABT065100	65,0000-83,0000	HSK63A	50,0	128,0	102,0	92,0	64,0	C
6922556	HSK63ABT082100	82,0000-103,0000	HSK63A	63,0	128,0	102,0	92,0	64,0	C
6922557	HSK63ABT100120	100,0000-130,0000	HSK63A	80,0	148,0	122,0	112,0	84,0	C
6922558	HSK63ABT125120	125,0000-167,5000	HSK63A	100,0	148,0	122,0	112,0	84,0	C
6922559	HSK63ABT1625150	162,5000-205,0000	HSK63A	135,0	178,0	152,0	142,0	114,0	C

eBore Fine Boring • Insert Holder

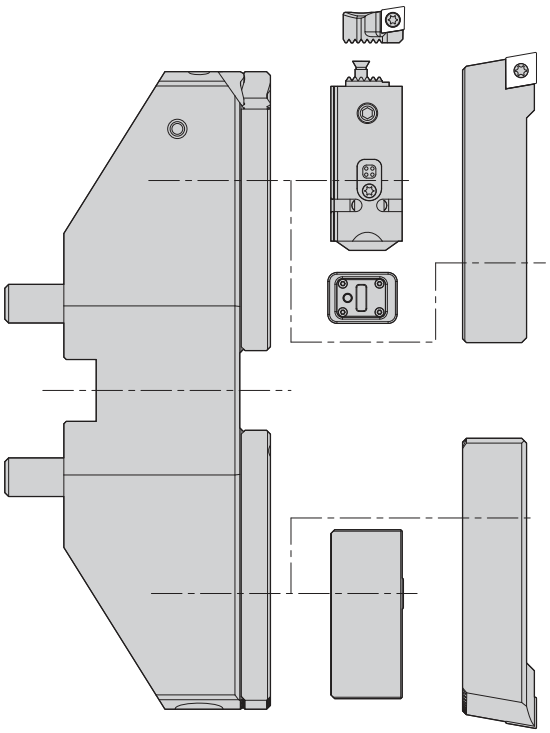




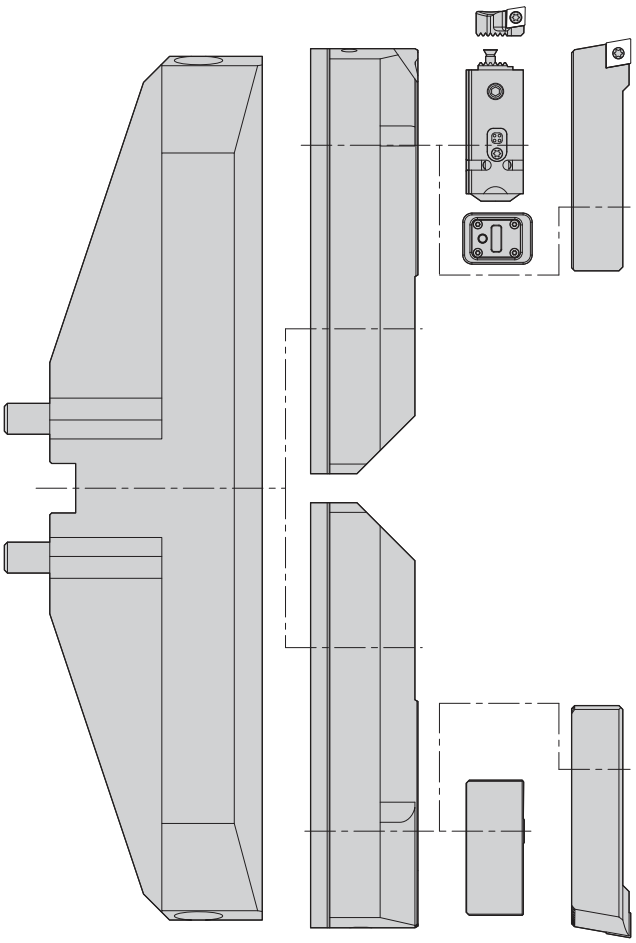
order number	catalogue number	D min	D max	IHS
6655291	IHBT024CC06	24,5	37,0	A
6655293	IHBT036CC06	36,0	66,0	B
6655296	IHBT065CC06	65,0	205,0	C

eBore™ Bridge Tools Overview

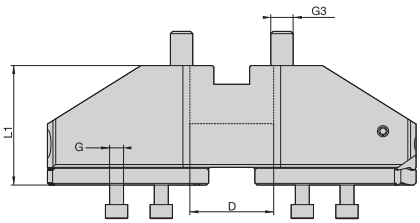
eBore — Bridge S (Small)



eBore — Bridge L (Large)

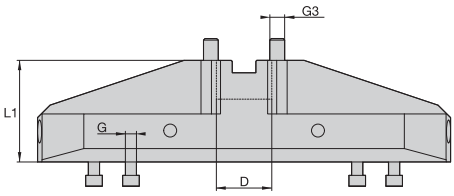


eBore™ • Bridge S



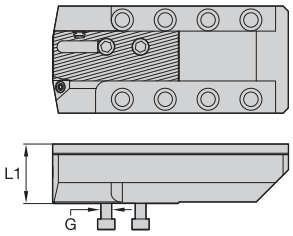
order number	catalogue number	BR1	D	L1	L1 assy	G	G3
6655282	BDG20060	200,0000-280,0000	60,0	85,0	115,1	M10X50	M16X2
6655284	BDG27560	275,0000-355,0000	60,0	85,0	115,1	M10X50	M16X2
6655285	BDG35060	350,0000-430,0000	60,0	85,0	115,1	M10X50	M16X2
6655286	BDG42560	425,0000-505,0000	60,0	85,0	115,1	M10X50	M16X2

eBore™ • Bridge • Large



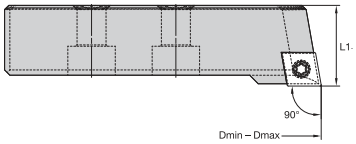
order number	catalogue number	BR1	D	L1	L1 assy	G	G3
6655287	BDG46560	465,0000-745,0000	60,0	110,0	185,1	M12X55	M16X2
6655289	BDG74060	740,0000-1020,0000	60,0	110,0	185,1	M12X55	M16X2

eBore • Bridge • Large • Extender



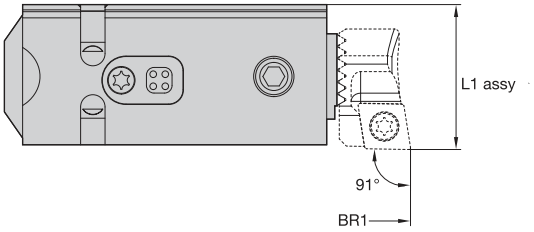
order number	catalogue number	L1	G
6655288	SBDG46545	45,0	M10X1,5

eBore • Bridge S/L • Insert Holder • CC12



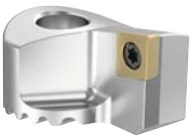
order number	catalogue number	D min	D max	L1
6655283	IHBDGCC12	200,0	1020,0	30,1

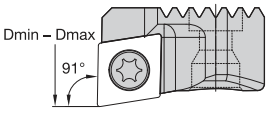
eBore™ • Bridge S/L • Slide



order number	catalogue number	BR1	L1 assy
6655302	BFBS10012	100,0000	30,0

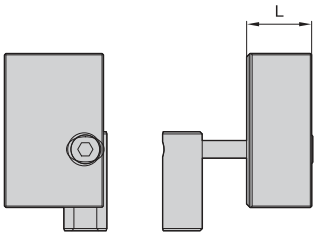
eBore • Bridge S/L • Slide Insert Holder • CC09





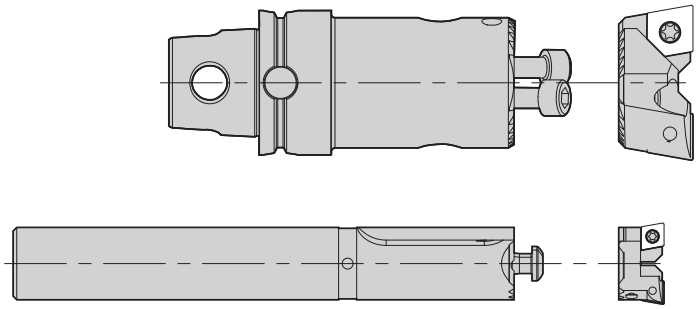
order number	catalogue number	D min	D max
6655303	IHBFBSCC09	200,0	1020,0

eBore • Bridge S/L • Slide • Counterweight

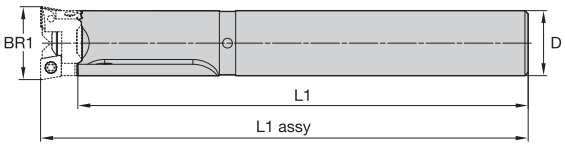


order number	catalogue number	L
6655305	CWBFBS	68,2

eBore™ Twin Cutter Overview

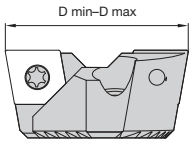


eBore • Twin Cutter • Straight Shank



order number	catalogue number	BR1	D	L1	L1 assy
6655239	SS18TC0195	19,5000-23,0000	18,0	138,0	150,0
6655241	SS20TC0225	22,2000-26,0000	20,0	138,0	150,0
6922560	SS25TC0255	25,5000-30,0000	25,0	148,0	160,0

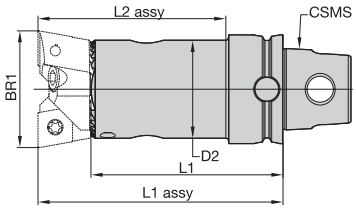
eBore • Twin Cutter • Straight Shank • Insert Holder



order number	catalogue number	D min	D max
6655240	IHTC0195CC06	19,5	23,0
6655242	IHTC0225CC06	22,5	26,0
6655244	IHTC0255CC06	25,5	30,0

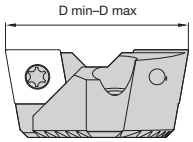
NOTE: Order two insert holders for complete assembly as shown on the image.

eBore™ • Twin Cutter • KM™



order number	catalogue number	BR1	CSMS	D2	L1	L1 assy	L2 assy
6655245	KM32TC029	29,0000-37,0000	KM32TS	25,0	86,0	100,0	88,0
6655247	KM32TC036	36,0000-44,0000	KM32TS	30,0	86,0	100,0	79,5
6655249	KM40TC043	43,0000-54,0000	KM40TS	36,0	70,0	90,0	69,0
6655271	KM50TC053	53,0000-66,0000	KM50TS	40,0	70,0	90,1	70,1
6655273	KM50TC065	65,0000-83,0000	KM50TS	50,0	70,0	90,1	90,1
6655275	KM63TC082	82,0000-103,0000	KM63TS	63,0	70,0	100,1	100,1
6655277	KM80TC100	100,0000-155,0000	KM80TS	80,0	90,0	120,1	120,1
6655280	KM80TC150	150,0000-205,0000	KM80TS	125,0	120,0	150,1	150,1

eBore • Twin Cutter • KM • Insert Holder



order number	catalogue number	D min	D max
6655246	IHTC029CC09	29,0	37,0
6655248	IHTC036CC09	36,0	44,0
6655250	IHTC043CC12	43,0	54,0
6655272	IHTC053CC12	53,0	66,0
6655274	IHTC065CC12	65,0	83,0
6655276	IHTC082CC12	82,0	103,0
6655278	IHTC100CC12	100,0	130,0
6655279	IHTC125CC12	125,0	205,0

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Tapping

VariTap D4–D23

Victory..... D24–D25

Tap Drill Size Charts..... D26–D30

Technical Information D31–D33

VariTap has optimized geometries capable of working in a wide variety of ductile materials – including carbon and alloy steels, stainless steels, ductile iron, and cast aluminum.

Advanced spiral flute design
Smooth ejection of chip to reduce or eliminate bird-nesting

Multiple tap dimension options
ANSI, DIN, JIS, and DIN/ANSI

High-vanadium HSS-E
Improved wear characteristics, longer tool life

The VariTap platform is designed with a positive rake face and a flute optimized for tapping multiple materials.

GRADES

WP42EG	TiCN
P	●
M	●
K	●
N	●
S	
H	

WU41EG	TiN
P	●
M	○
K	○
N	○
S	
H	

WP49EG	Oxide
P	○
M	○
K	○
N	
S	
H	

VERSATILE MULTI-MATERIAL TAPS

WIDIA GTD

PRODUCT

VariTap™ taps deliver performance for value in multi-material tapping applications.

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

P M K N

APPLICATIONS

BLIND HOLE

THROUGH HOLE

HSS-E

FORM E

FORM C

FORM B

ANSI UNC

ANSI UNF

ANSI M

ANSI MF

FLOOD COOLANT: TAPPING

CLASS OF FIT: 2B

CLASS OF FIT: 3B

CLASS OF FIT: 6H

SPIRAL POINT WITH ANSI DIMENSIONS

SIZE RANGE	CHAMFER STYLE	GRADE	
2–56 to 1–12"	Plug (Form B)	**WP49EG** **WP42EG**	All H Limits
		WU41EG	3B Only
1-1/8–8" to 2–4-1/2"	Plug (Form B)	**WP49EG**	
M3 x 0.50 to M12 x 1.75	Plug (Form B)	**WP49EG** **WP42EG** **WU41EG**	6H D Limits
		WP49EG **WP42EG**	D11
M14 x 1.5 to M20 x 2.5	Plug (Form B)	**WP49EG** **WP42EG**	
M22 x 1.5 to M30 x 3.5	Plug (Form B)	**WP49EG**	

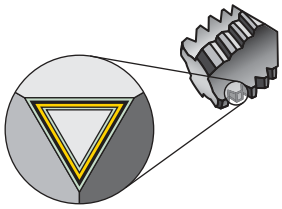
SPIRAL FLUTE WITH ANSI DIMENSIONS

SIZE RANGE	CHAMFER STYLE	GRADE	
2–56 to 1–12"	Semi-Bottom (Form C)	**WP49EG** **WP42EG**	All H Limits
1-1/8–8" to 2–4-1/2"	Semi-Bottom (Form C)	**WP49EG**	
4–40 to ¾–16	Bottom (Form E)	**WP49EG**	
M3 x 0.50 to M12 x 1.75	Semi-Bottom (Form C)	**WP49EG** **WP42EG** **WU41EG**	6H D Limits
		WP49EG **WP42EG**	D11
M14 x 1.5 to M20 x 2.5	Semi-Bottom (Form C)	**WP49EG** **WP42EG**	
M22 x 1.5 to M30 x 3.5	Semi-Bottom (Form C)	**WP49EG**	
M3 x 0.50 to M18 x 1.5	Bottom (Form E)	**WP49EG**	

Shank Style

ANSI, DIN, JIS, and DIN/ANSI precision ground to h9 tolerance

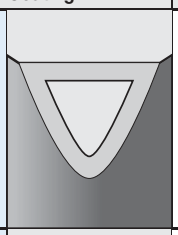
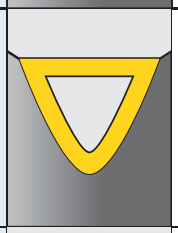
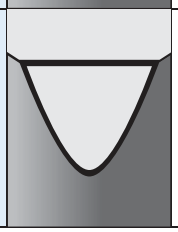
Grades and Grade Descriptions



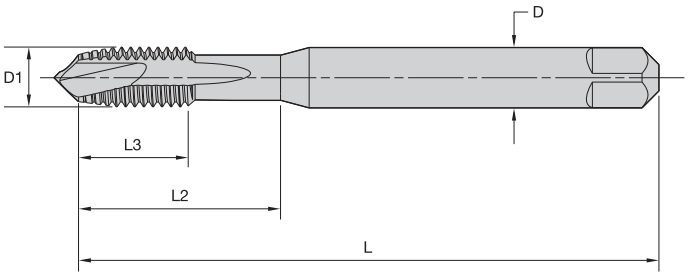
Coatings are designed for optimized tapping performance in specific materials.

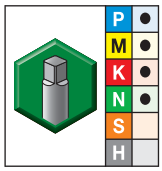
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

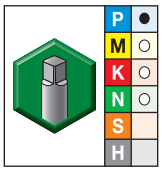
wear resistance ← → toughness

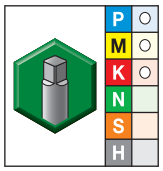
Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WP42EG		Coated HSS-E substrate with TiCN PVD layer. Use in multiple applications, including steel, stainless steel, ductile cast iron, and cast aluminum. WP42EG is more abrasion-resistant than WU41EG.	P									
			M									
			K									
			N									
WU41EG		Coated HSS-E substrate with TiN PVD layer. Use in multiple applications, including steel, stainless steel, ductile cast iron, and cast aluminum.	P									
			M									
			K									
			N									
WP49EG		HSS-E substrate with black oxide surface treatment. Use in a variety of materials, including steel, stainless steel, and ductile iron. Not recommended for non-ferrous materials.	P									
			M									
			K									

VT-SPO • Form B Plug Chamfer • Metric • DIN 371, 374, and 376





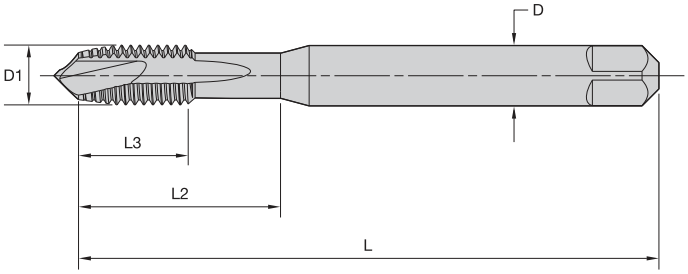


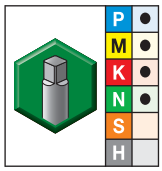


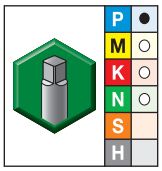
● first choice
○ alternate choice

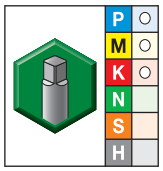
grade WP42EG TiCN		grade WU41EG TiN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5366647	VTSPO6505	5366646	VTSPO6505	5366648	VTSPO6505	M2 X 0,4	45	7	13	2,8	2	DIN 371	6H
	–		–	5366660	VTSPO6506	M2 X 0,4	45	7	13	2,8	2	DIN 371	6G
	–		–	5366661	VTSPO6507	M2,2 X 0,45	45	7	13	2,8	2	DIN 371	6H
	–	5366662	VTSPO6508	5366663	VTSPO6508	M2,5 X 0,45	50	7	15	2,8	2	DIN 371	6H
	–		–	5366665	VTSPO6509	M2,5 X 0,45	50	7	15	2,8	2	DIN 371	6G
	–		–	5368515	VTSPO6525	M3 X 0,5	56	8	—	2,2	2	DIN 376	6H
5366667	VTSPO6510	5366666	VTSPO6510	5366668	VTSPO6510	M3 X 0,5	56	8	18	3,5	2	DIN 371	6H
	–	5366671	VTSPO6512	5366673	VTSPO6512	M3,5 X 0,6	56	9	20	4,0	2	DIN 371	6H
	–		–	5368604	VTSPO6546	M4 X 0,5	63	10	21	2,8	2	DIN 374	6H
	–		–	5368518	VTSPO6526	M4 X 0,7	63	10	21	2,8	2	DIN 376	6H
5366676	VTSPO6513	5366675	VTSPO6513	5366677	VTSPO6513	M4 X 0,7	63	11	21	4,5	2	DIN 371	6H
	–		–	5368606	VTSPO6547	M5 X 0,5	70	12	25	3,5	2	DIN 374	6H
	–	5368540	VTSPO6527	5368541	VTSPO6527	M5 X 0,8	70	12	25	3,5	2	DIN 376	6H
5366681	VTSPO6515	5366680	VTSPO6515	5366682	VTSPO6515	M5 X 0,8	70	12	25	6,0	2	DIN 371	6H
	–		–	5368610	VTSPO6549	M6 X 0,75	80	12	30	4,5	3	DIN 374	6H
	–	5368543	VTSPO6528	5368544	VTSPO6528	M6 X 1	80	12	30	4,5	3	DIN 376	6H
5366687	VTSPO6517	5366686	VTSPO6517	5366688	VTSPO6517	M6 X 1	80	12	30	6,0	3	DIN 371	6H
	–		–	5366690	VTSPO6518	M6 X 1	80	12	30	6,0	3	DIN 371	6G
	–		–	5368612	VTSPO6550	M7 X 0,75	80	12	30	5,5	3	DIN 374	6H
5366693	VTSPO6519		–	5366695	VTSPO6519	M7 X 1	80	12	30	7,0	3	DIN 371	6H
	–		–	5368614	VTSPO6551	M8 X 0,75	80	12	30	6,0	3	DIN 374	6H
	–		–	5368616	VTSPO6552	M8 X 1	90	15	35	6,0	3	DIN 374	6H
	–	5368546	VTSPO6529	5368547	VTSPO6529	M8 X 1,25	90	15	35	6,0	3	DIN 376	6H
5366700	VTSPO6521	5366698	VTSPO6521	5366701	VTSPO6521	M8 X 1,25	90	15	35	8,0	3	DIN 371	6H
	–		–	5366704	VTSPO6522	M8 X 1,25	90	15	35	8,0	3	DIN 371	6G
	–		–	5368618	VTSPO6553	M10 X 0,75	90	15	35	7,0	3	DIN 374	6H
	–		–	5368620	VTSPO6554	M10 X 1	90	15	35	7,0	3	DIN 374	6H
	–		–	5368622	VTSPO6555	M10 X 1,25	100	18	39	7,0	3	DIN 374	6H
	–		–	5366709	VTSPO6524	M10 X 1,5	100	18	39	10,0	3	DIN 371	6G
5366706	VTSPO6523	5366705	VTSPO6523	5366707	VTSPO6523	M10 X 1,5	100	18	39	10,0	3	DIN 371	6H
	–		–	5368550	VTSPO6530	M10 X 1,5	100	18	39	7,0	3	DIN 376	6H
	–		–	5368624	VTSPO6556	M11 X 1	90	15	36	8,0	3	DIN 374	6H
	–		–	5368626	VTSPO6557	M12 X 1	100	21	39	9,0	3	DIN 374	6H
	–		–	5368628	VTSPO6558	M12 X 1,25	100	21	39	9,0	3	DIN 374	6H
	–		–	5368630	VTSPO6559	M12 X 1,5	100	21	39	9,0	3	DIN 374	6H
	–		–	5368556	VTSPO6532	M12 X 1,75	110	21	44	9,0	3	DIN 376	6G
5368553	VTSPO6531	5368552	VTSPO6531	5368554	VTSPO6531	M12 X 1,75	110	21	44	9,0	3	DIN 376	6H
	–		–	5368632	VTSPO6560	M14 X 1	100	21	47	11,0	3	DIN 374	6H
	–		–	5368636	VTSPO6562	M14 X 1,5	100	21	47	11,0	3	DIN 374	6H
5368558	VTSPO6533	5368557	VTSPO6533	5368559	VTSPO6533	M14 X 2	110	24	52	11,0	3	DIN 376	6H
	–		–	5368561	VTSPO6534	M14 X 2	110	24	52	11,0	3	DIN 376	6G
	–		–	5368638	VTSPO6563	M16 X 1	100	21	46	12,0	3	DIN 374	6H
	–		–	5368640	VTSPO6564	M16 X 1,5	100	21	46	12,0	3	DIN 374	6H
5368563	VTSPO6535	5368562	VTSPO6535	5368565	VTSPO6535	M16 X 2	110	24	51	12,0	3	DIN 376	6H
	–		–	5368567	VTSPO6536	M16 X 2	110	24	51	12,0	3	DIN 376	6G
	–		–	5368642	VTSPO6565	M18 X 1	110	21	50	14,0	3	DIN 374	6H
	–		–	5368683	VTSPO6566	M18 X 1,5	110	21	50	14,0	3	DIN 374	6H
	–		–	5368685	VTSPO6567	M18 X 2	125	30	58	14,0	3	DIN 374	6H

VT-SPO • Form B Plug Chamfer • Metric • DIN 371, 374, and 376





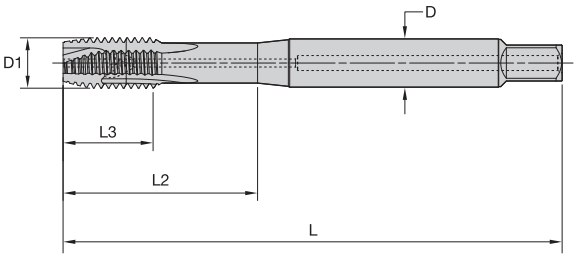


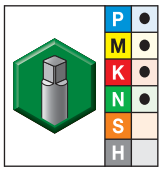


● first choice
○ alternate choice

grade WP42EG TiCN		grade WU41EG TiN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5368569	VTSPO6537	5368568	VTSPO6537	5368570	VTSPO6537	M18 X 2,5	125	30	58	14,0	3	DIN 376	6H
	–		–	5368687	VTSPO6568	M20 X 1	125	24	56	16,0	3	DIN 374	6H
	–		–	5368689	VTSPO6569	M20 X 1,5	125	24	56	16,0	3	DIN 374	6H
	–		–	5368691	VTSPO6570	M20 X 2	140	30	64	16,0	3	DIN 374	6H
5368573	VTSPO6538	5368572	VTSPO6538	5368574	VTSPO6538	M20 X 2,5	140	30	64	16,0	3	DIN 376	6H
	–		–	5368693	VTSPO6571	M22 X 1,5	125	24	62	18,0	3	DIN 374	6H
5368577	VTSPO6539	5368576	VTSPO6539	5368578	VTSPO6539	M22 X 2,5	140	30	70	18,0	3	DIN 376	6H
	–		–	5368696	VTSPO6573	M24 X 1,5	140	28	67	18,0	3	DIN 374	6H
5368581	VTSPO6540	5368580	VTSPO6540	5368582	VTSPO6540	M24 X 3	160	36	77	18,0	3	DIN 376	6H
	–	5368584	VTSPO6541	5368585	VTSPO6541	M27 X 3	160	36	82	20,0	4	DIN 376	6H
	–		–	5368588	VTSPO6542	M30 X 3,5	180	42	91	22,0	4	DIN 376	6H
	–		–	5368600	VTSPO6543	M33 X 3,5	180	42	100	25,0	4	DIN 376	6H
	–		–	5368601	VTSPO6544	M36 X 4	200	48	110	28,0	4	DIN 376	6H

VT-SPO • Form B Plug Chamfer • Through Coolant • Metric • DIN Length ANSI Shank

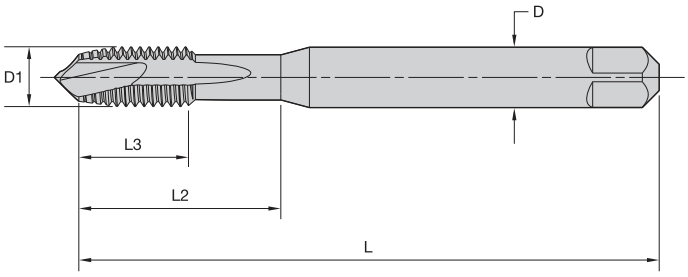


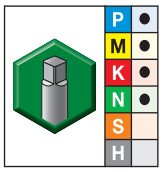


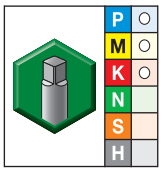
● first choice
○ alternate choice

grade WP42EG TiCN									
order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5368483	VTSPO9911	M12 X 1,75	4.33	.83	1.73	.367	3	DIN-ANSI	6H
5368485	VTSPO9913	M14 X 2	4.33	.94	2.05	.429	3	DIN-ANSI	6H

VT-SPO • Form B Plug Chamfer • Metric • DIN Length ANSI Shank



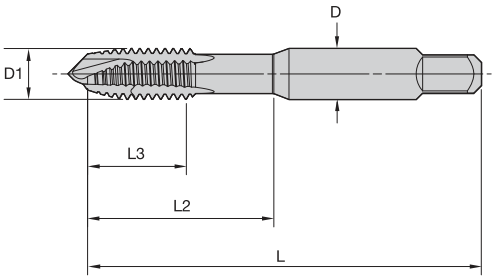


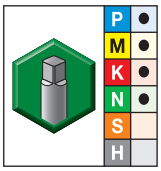


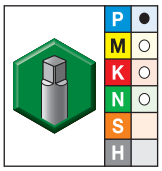
● first choice
○ alternate choice

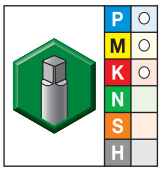
grade WP42EG TiCN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5368174	VTSPO9507	5368173	VTSPO9507	M4 X 0,7	2.48	.43	.83	.168	2	DIN-ANSI	6H
5368176	VTSPO9508	5368175	VTSPO9508	M5 X 0,8	2.75	.47	.97	.194	2	DIN-ANSI	6H
5368178	VTSPO9509	5368177	VTSPO9509	M6 X 1	3.15	.47	1.18	.255	3	DIN-ANSI	6H
5368180	VTSPO9510	5368179	VTSPO9510	M8 X 1,25	3.54	.59	1.37	.318	3	DIN-ANSI	6H
5368184	VTSPO9512	5368183	VTSPO9512	M10 X 1,5	3.94	.71	1.53	.381	3	DIN-ANSI	6H
	–	5368187	VTSPO9514	M12 X 1,5	4.33	.83	1.73	.367	3	DIN-ANSI	6H
5368190	VTSPO9515	5368189	VTSPO9515	M12 X 1,75	4.33	.83	1.73	.367	3	DIN-ANSI	6H
5368197	VTSPO9518	5368196	VTSPO9518	M16 X 1,5	4.33	.94	2.01	.480	3	DIN-ANSI	6H
5368199	VTSPO9519	5368198	VTSPO9519	M16 X 2	4.33	.94	2.01	.480	3	DIN-ANSI	6H
	–	5368200	VTSPO9520	M18 X 1,5	4.92	1.18	2.28	.542	3	DIN-ANSI	6H
	–	5368202	VTSPO9521	M18 X 2,5	4.92	1.18	2.28	.542	3	DIN-ANSI	6H
5368207	VTSPO9523		–	M20 X 2,5	5.51	1.18	2.52	.652	3	DIN-ANSI	6H

VT-SPO • Form B Plug Chamfer • Metric • ANSI





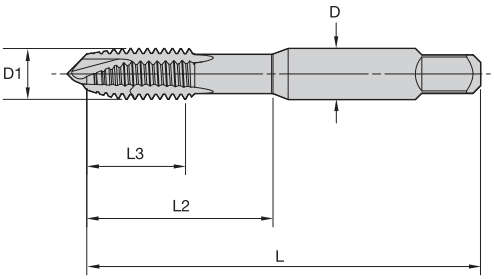


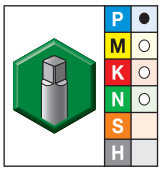


● first choice
○ alternate choice

grade WP42EG TiCN		grade WU41EG TiN		grade WP49EG Oxide								
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
5362670	VTSPO5505	5362671	VTSPO5505	5362589	VTSPO5505	M3 X 0,5	49,30	14,80	19,10	3,581	2	D3
–		–		5362673	VTSPO5506	M3 X 0,5	49,30	14,80	19,10	3,581	2	D11
5631641	VTSPO5613	–		5631640	VTSPO5613	M3 X 0,5	49,30	14,80	19,10	3,581	3	D3
5631645	VTSPO5614	–		5631644	VTSPO5614	M3 X 0,5	49,30	14,80	19,10	3,581	3	D11
5362677	VTSPO5507	–		5362676	VTSPO5507	M3,5 X 0,6	50,50	9,70	18,00	3,581	2	D4
–		–		5631646	VTSPO5615	M3,5 X 0,6	50,50	9,70	18,00	3,581	3	D4
–		–		5362695	VTSPO5510	M4 X 0,7	53,80	9,70	19,40	4,267	2	D11
5362692	VTSPO5509	5362693	VTSPO5509	5362691	VTSPO5509	M4 X 0,7	53,80	9,70	19,40	4,267	2	D4
5631652	VTSPO5617	5631653	VTSPO5617	5631651	VTSPO5617	M4 X 0,7	53,80	9,70	19,40	4,267	3	D4
–		–		5631655	VTSPO5618	M4 X 0,7	53,80	9,70	19,40	4,267	3	D11
5362702	VTSPO5512	–		5362701	VTSPO5512	M5 X 0,8	60,30	12,70	23,20	4,928	2	D11
5362698	VTSPO5511	5362699	VTSPO5511	5362697	VTSPO5511	M5 X 0,8	60,30	12,70	23,20	4,928	2	D4
5631659	VTSPO5619	5631670	VTSPO5619	5631658	VTSPO5619	M5 X 0,8	60,30	12,70	23,20	4,928	3	D4
5362704	VTSPO5513	5362705	VTSPO5513	5362703	VTSPO5513	M6 X 1	63,50	16,00	25,40	6,477	3	D5
5362708	VTSPO5514	–		5362707	VTSPO5514	M6 X 1	63,50	16,00	25,40	6,477	3	D11
5362710	VTSPO5515	–		5362709	VTSPO5515	M7 X 1	69,20	17,50	29,30	8,077	3	D5
5362715	VTSPO5517	–		5362714	VTSPO5517	M8 X 1	68,70	17,50	28,50	8,077	3	D5
5362722	VTSPO5519	5362723	VTSPO5519	5362720	VTSPO5519	M8 X 1,25	68,90	17,50	28,60	8,077	3	D5
5362728	VTSPO5520	–		5362727	VTSPO5520	M8 X 1,25	68,90	17,50	28,60	8,077	3	D11
5362730	VTSPO5521	–		5362729	VTSPO5521	M10 X 1	74,00	19,10	31,60	9,677	3	D5
5362733	VTSPO5522	–		5362732	VTSPO5522	M10 X 1	74,00	19,10	31,60	9,677	3	D11
–		–		5367307	VTSPO5524	M10 X 1,25	74,10	18,90	31,80	9,677	3	D11
5367305	VTSPO5523	–		5367304	VTSPO5523	M10 X 1,25	74,10	18,90	31,80	9,677	3	D5
5367340	VTSPO5525	5367341	VTSPO5525	5367309	VTSPO5525	M10 X 1,5	74,30	19,10	31,90	9,677	3	D6
5367344	VTSPO5526	–		5367343	VTSPO5526	M10 X 1,5	74,30	19,10	31,90	9,677	3	D11
5367346	VTSPO5527	–		5367345	VTSPO5527	M12 X 1,25	85,80	23,90	44,20	9,322	3	D6
–		–		5367353	VTSPO5530	M12 X 1,5	85,90	23,90	44,20	9,322	3	D11
5367351	VTSPO5529	–		5367350	VTSPO5529	M12 X 1,5	85,90	23,90	44,20	9,322	3	D6
5367360	VTSPO5532	–		–		M12 X 1,75	85,90	23,90	44,20	9,322	3	D11
5367356	VTSPO5531	5367357	VTSPO5531	5367355	VTSPO5531	M12 X 1,75	85,90	23,90	44,20	9,322	3	D6
5367362	VTSPO5533	–		5367361	VTSPO5533	M14 X 1,5	91,20	25,40	44,20	10,897	3	D6
5367365	VTSPO5534	–		5367364	VTSPO5534	M14 X 2	91,20	25,40	44,20	10,897	3	D7
5366476	VTSPO5535	–		5366475	VTSPO5535	M16 X 1,5	96,80	27,70	48,00	12,192	3	D6
5366480	VTSPO5536	5366481	VTSPO5536	5366479	VTSPO5536	M16 X 2	96,80	27,70	48,00	12,192	3	D7
5366485	VTSPO5537	–		5366483	VTSPO5537	M18 X 1,5	102,40	27,70	48,00	13,767	3	D6
5366488	VTSPO5538	–		5366487	VTSPO5538	M18 X 2,5	102,40	31,00	48,00	13,767	3	D7
5366491	VTSPO5539	–		5366490	VTSPO5539	M20 X 1,5	113,50	31,00	52,80	16,561	3	D6
5366493	VTSPO5540	–		5366492	VTSPO5540	M20 X 2,5	113,50	31,00	52,80	16,561	3	D7
–		–		5366494	VTSPO5541	M22 X 1,5	119,10	31,00	58,40	17,704	3	D6
–		–		5366495	VTSPO5542	M22 X 2,5	119,10	31,00	58,40	17,704	3	D7
–		–		5366496	VTSPO5543	M24 X 2	124,70	31,00	58,40	19,314	3	D7
–		–		5366497	VTSPO5544	M24 X 3	124,70	31,00	58,40	19,314	3	D8
–		–		5366498	VTSPO5545	M27 X 1,5	130,30	31,00	63,50	22,758	4	D7
–		–		5366499	VTSPO5546	M27 X 3	130,30	31,00	63,50	22,758	4	D8
–		–		5366510	VTSPO5547	M30 X 1,5	138,20	31,00	65,00	25,933	4	D6
–		–		5366511	VTSPO5548	M30 X 3,5	138,20	31,00	65,00	25,933	4	D9

VT-SPO • Form B Plug Chamfer • Metric • JIS

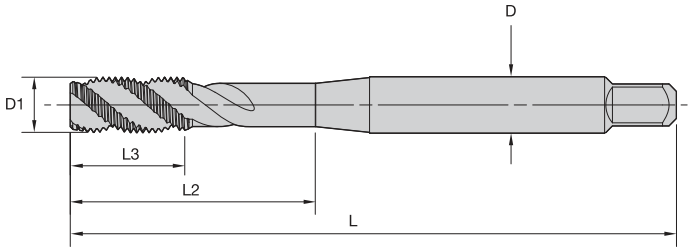


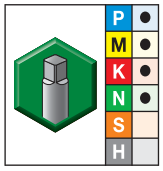


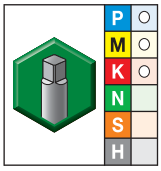
● first choice
○ alternate choice

grade WU41EG TiN									
order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	tap class
5387865	VTSPO7506	M4 X 0,7	52	13	21	5,0	2	JIS	ISO 2
5387869	VTSPO7507	M5 X 0,8	60	16	24	5,5	2	JIS	ISO 2
5387873	VTSPO7508	M6 X 1	62	19	29	6,0	3	JIS	ISO 2
5387877	VTSPO7509	M8 X 1,25	70	22	37	6,2	3	JIS	ISO 2
5387881	VTSPO7510	M10 X 1,5	75	24	41	7,0	3	JIS	ISO 2

VT-SFT • Form C Semi-Bottoming Chamfer • Metric • DIN Length ANSI Shank





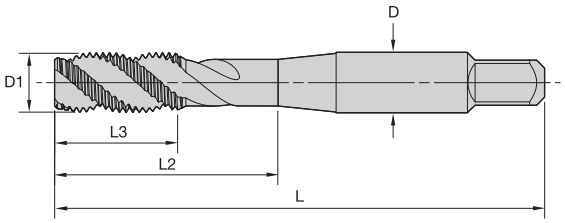


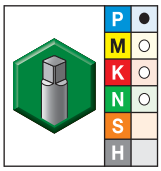
● first choice
○ alternate choice

grade WP42EG TiCN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5436528	VTSFT9507	5436527	VTSFT9507	M6 X 1	3.15	.47	1.18	.255	3	DIN-ANSI	6H
5436540	VTSFT9508	–		M8 X 1,25	3.54	.58	1.37	.318	3	DIN-ANSI	6H
5436544	VTSFT9510	–		M10 X 1,5	3.94	.71	1.53	.381	3	DIN-ANSI	6H
5436546	VTSFT9511	–		M12 X 1,25	4.33	.83	1.73	.367	3	DIN-ANSI	6H
5436550	VTSFT9513	–		M12 X 1,75	4.33	.83	1.73	.367	3	DIN-ANSI	6H

NOTE: Suggested for use in rigid and synchronous holders.

VT-SFT • Form C Semi-Bottoming Chamfer • Metric • JIS



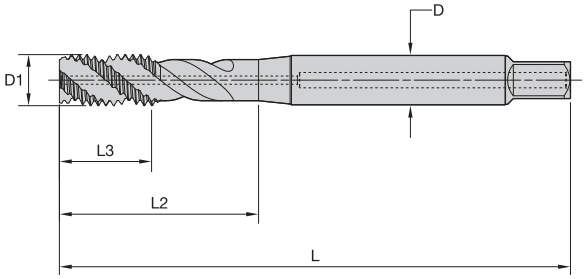


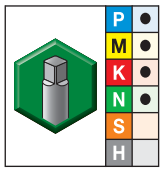
● first choice
○ alternate choice

grade WU41EG TiN									
order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	tap class
5398791	VTSFT7506	M4 X 0,7	52	13	21	5,0	3	JIS	ISO 2
5398793	VTSFT7507	M5 X 0,8	60	16	24	5,5	3	JIS	ISO 2
5398795	VTSFT7508	M6 X 1	62	19	29	6,0	3	JIS	ISO 2
5398797	VTSFT7509	M8 X 1,25	70	22	37	6,2	3	JIS	ISO 2

NOTE: Suggested for use in rigid and synchronous holders.

VT-SFT • Form C Semi-Bottoming Chamfer • Through Coolant • Metric • DIN Length ANSI Shank



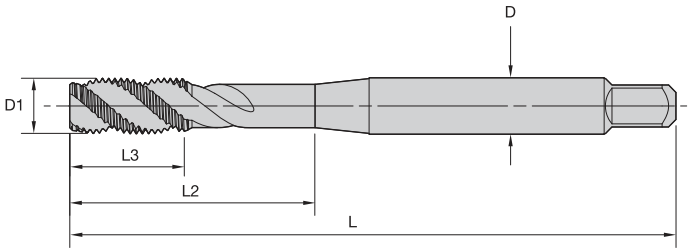


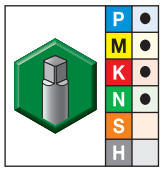
● first choice
○ alternate choice

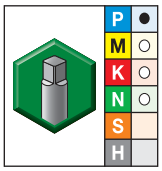
grade WP42EG TiCN									
order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5436475	VTSFT9925	M6 X 1	3.15	.47	1.18	.255	3	DIN-ANSI	6H
5436476	VTSFT9926	M8 X 1,25	3.54	.59	1.38	.318	3	DIN-ANSI	6H
5436478	VTSFT9928	M10 X 1,5	3.94	.71	1.53	.381	3	DIN-ANSI	6H
5436481	VTSFT9931	M12 X 1,75	4.33	.83	1.73	.367	3	DIN-ANSI	6H

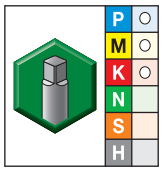
NOTE: Suggested for use in rigid and synchronous holders.

VT-SFT • Form C Semi-Bottoming Chamfer • Metric • DIN 371, 374, and 376







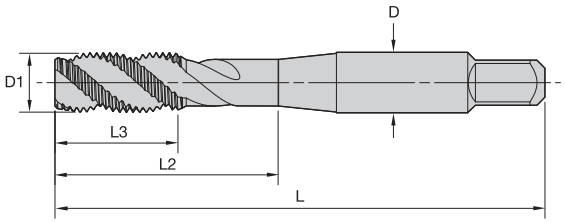


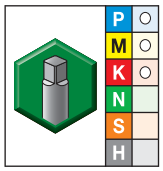
● first choice
○ alternate choice

grade WP42EG TiCN		grade WU41EG TiN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5368703	VTSFT6506		–	5368704	VTSFT6506	M2 X 0,4	45	7	13	2,8	2	DIN 371	6H
	–		–	5368707	VTSFT6508	M2,2 X 0,45	45	7	13	2,8	2	DIN 371	6H
	–	5368708	VTSFT6509	5368709	VTSFT6509	M2,5 X 0,45	50	7	15	2,8	2	DIN 371	6H
	–		–	5368726	VTSFT6512	M3 X 0,5	56	8	18	3,5	2	DIN 371	6G
5368723	VTSFT6511		–	5368724	VTSFT6511	M3 X 0,5	56	8	18	3,5	2	DIN 371	6H
	–		–	5402139	VTSFT6546	M4 X 0,5	63	10	21	2,8	3	DIN 374	6H
	–		–	5402229	VTSFT6526	M4 X 0,7	63	10	21	2,8	3	DIN 376	6H
5368731	VTSFT6514		–	5368732	VTSFT6514	M4 X 0,7	63	11	21	4,5	3	DIN 371	6H
	–		–	5368734	VTSFT6515	M4 X 0,7	63	11	21	4,5	3	DIN 371	6G
	–		–	5402181	VTSFT6547	M5 X 0,5	70	12	25	3,5	3	DIN 374	6H
5368736	VTSFT6516		–	5368737	VTSFT6516	M5 X 0,8	70	12	25	6,0	3	DIN 371	6H
	–		–	5402251	VTSFT6527	M5 X 0,8	70	12	25	3,5	3	DIN 376	6H
	–		–	5368739	VTSFT6517	M5 X 0,8	70	12	25	6,0	3	DIN 371	6G
	–		–	5402185	VTSFT6549	M6 X 0,75	80	12	30	4,5	3	DIN 374	6H
	–		–	5402253	VTSFT6528	M6 X 1	80	12	30	4,5	3	DIN 376	6H
5368741	VTSFT6518		–	5368742	VTSFT6518	M6 X 1	80	12	30	6,0	3	DIN 371	6H
	–		–	5368745	VTSFT6520	M7 X 1	80	12	30	7,0	3	DIN 371	6H
	–		–	5402186	VTSFT6550	M8 X 0,75	80	12	30	6,0	3	DIN 374	6H
5402188	VTSFT6551		–	5402189	VTSFT6551	M8 X 1	90	15	35	6,0	3	DIN 374	6H
	–		–	5368752	VTSFT6522	M8 X 1,25	90	15	35	8,0	3	DIN 371	6G
5368749	VTSFT6521	5368748	VTSFT6521	5368750	VTSFT6521	M8 X 1,25	90	15	35	8,0	3	DIN 371	6H
	–		–	5402192	VTSFT6553	M10 X 1	90	15	35	7,0	3	DIN 374	6H
5402194	VTSFT6554		–	5402195	VTSFT6554	M10 X 1,25	100	18	39	7,0	3	DIN 374	6H
5368754	VTSFT6523	5368753	VTSFT6523	5368755	VTSFT6523	M10 X 1,5	100	18	39	10,0	3	DIN 371	6H
	–		–	5402197	VTSFT6555	M12 X 1	100	21	39	9,0	3	DIN 374	6H
	–		–	5402199	VTSFT6556	M12 X 1,25	100	21	39	9,0	3	DIN 374	6H
5402201	VTSFT6557		–	5402202	VTSFT6557	M12 X 1,5	100	21	39	9,0	3	DIN 374	6H
	–		–	5402263	VTSFT6532	M12 X 1,75	110	21	44	9,0	3	DIN 376	6G
5402260	VTSFT6531	5402259	VTSFT6531	5402261	VTSFT6531	M12 X 1,75	110	21	44	9,0	3	DIN 376	6H
5402206	VTSFT6560		–	5402207	VTSFT6560	M14 X 1,5	100	21	47	11,0	3	DIN 374	6H
5402265	VTSFT6533	5402264	VTSFT6533	5402266	VTSFT6533	M14 X 2	110	24	52	11,0	3	DIN 376	6H
	–		–	5402210	VTSFT6562	M16 X 1,5	100	21	46	12,0	3	DIN 374	6H
	–	5402269	VTSFT6535	5402270	VTSFT6535	M16 X 2	110	24	51	12,0	3	DIN 376	6H
	–		–	5402214	VTSFT6564	M18 X 1,5	110	21	50	14,0	4	DIN 374	6H
	–		–	5402217	VTSFT6567	M20 X 1,5	125	24	56	16,0	4	DIN 374	6H
	–		–	5402277	VTSFT6538	M20 X 2,5	140	30	64	16,0	4	DIN 376	6H
	–		–	5402223	VTSFT6571	M24 X 1,5	140	28	67	18,0	4	DIN 374	6H
	–		–	5402283	VTSFT6540	M24 X 3	160	36	77	18,0	4	DIN 376	6H
	–		–	5402286	VTSFT6541	M27 X 3	160	36	82	20,0	4	DIN 376	6H
	–		–	5402289	VTSFT6542	M30 X 3,5	180	42	91	22,0	4	DIN 376	6H
	–		–	5402291	VTSFT6543	M33 X 3,5	180	42	100	25,0	4	DIN 376	6H
	–		–	5402293	VTSFT6544	M36 X 4	200	48	110	28,0	5	DIN 376	6H

NOTE: Suggested for use in rigid and synchronous holders.

VT-SFT • Form E Bottoming Chamfer • Metric • ANSI



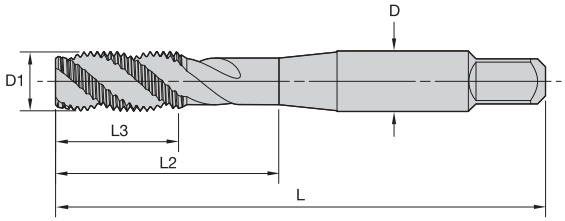


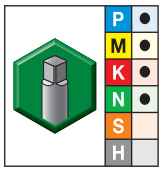
● first choice
○ alternate choice

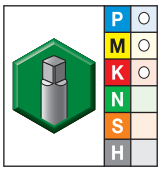
grade WP49EG Oxide								
order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
5400155	VTSFT5550	M3 X 0,5	1.94	.58	.75	.141	2	D3
5400157	VTSFT5552	M4 X 0,7	2.13	.38	.76	.168	3	D4
5400158	VTSFT5553	M5 X 0,8	2.38	.50	.91	.194	3	D4
5400159	VTSFT5554	M6 X 1	2.50	.63	1.00	.255	3	D5
5400231	VTSFT5556	M8 X 1,25	2.72	.69	1.12	.318	3	D5
5400233	VTSFT5558	M10 X 1,5	2.94	.75	1.26	.381	3	D6
5400235	VTSFT5560	M12 X 1,75	3.38	.94	1.74	.367	3	D6
5400239	VTSFT5564	M14 X 1,5	3.59	1.00	1.74	.429	3	D6
5400241	VTSFT5566	M16 X 1,5	3.81	1.09	1.89	.480	3	D6
5400240	VTSFT5565	M16 X 2	3.81	1.09	1.89	.480	3	D7

NOTE: Refer to tables on pages D32 for the recommended pitch diameter limit for 6H class of fit.
VariTap for 6H class of fit is suitable for MJ aerospace internal threading applications.

VT-SFT TC • Form C Semi-Bottoming Chamfer • Metric • ANSI • Tension/Compression Holders



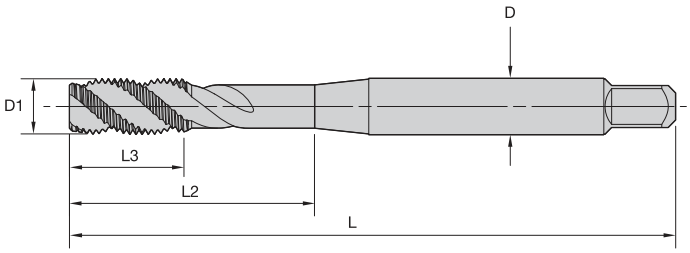


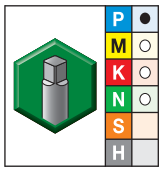


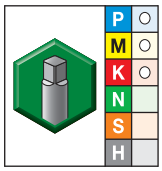
● first choice
○ alternate choice

grade WP42EG TiCN		grade WP49EG Oxide								
order #	catalogue #	order #	catalogue #	D1 TPI	L	L3	L2	D	number of flutes	pitch diameter limit
5887085	VTSFT-TC5505	5887084	VTSFT-TC5505	M3 X 0,5	49,40	14,80	19,30	3,581	3	D3
6141630	VTSFT-TC5507	6141781	VTSFT-TC5507	M3,5 X 0,6	50,50	9,70	18,00	3,582	2	D4
5887087	VTSFT-TC5509	5887086	VTSFT-TC5509	M4 X 0,7	53,80	9,70	19,40	4,267	3	D4
5887089	VTSFT-TC5511	5887088	VTSFT-TC5511	M5 X 0,8	60,30	12,70	23,20	4,928	3	D4
5887091	VTSFT-TC5513	5887090	VTSFT-TC5513	M6 X 1	63,50	16,00	25,50	6,477	3	D5
	–	6141790	VTSFT-TC5514	M6 X 1	63,50	16,00	25,50	6,477	3	D11
	–	6141792	VTSFT-TC5515	M7 X 1	69,20	17,50	29,30	8,077	3	D5
6141796	VTSFT-TC5517	6141797	VTSFT-TC5517	M8 X 1	68,70	17,50	28,50	8,077	3	D5
	–	6141799	VTSFT-TC5518	M8 X 1	68,70	17,50	28,50	8,077	3	D11
5887093	VTSFT-TC5519	5887092	VTSFT-TC5519	M8 X 1,25	68,70	17,50	28,50	8,077	3	D5
	–	6141801	VTSFT-TC5520	M8 X 1,25	68,70	17,50	28,50	8,077	3	D11
	–	6141803	VTSFT-TC5522	M10 X 1	73,90	18,70	31,60	9,678	3	D11
	–	6141805	VTSFT-TC5523	M10 X 1,25	74,10	18,90	31,80	9,678	3	D5
6141808	VTSFT-TC5525	6141809	VTSFT-TC5525	M10 X 1,5	74,30	19,00	31,90	9,678	3	D6
	–	6141811	VTSFT-TC5526	M10 X 1,5	74,20	19,00	31,60	9,678	3	D11
	–	6140508	VTSFT-TC5527	M12 X 1,25	85,90	23,90	44,20	9,322	3	D5
	–	6140512	VTSFT-TC5529	M12 X 1,5	85,90	23,90	44,20	9,322	3	D6
5887097	VTSFT-TC5531	5887096	VTSFT-TC5531	M12 X 1,75	85,90	23,90	44,20	9,322	3	D6
6140515	VTSFT-TC5532	6140516	VTSFT-TC5532	M12 X 1,75	85,90	23,90	44,20	9,322	3	D11
	–	6140518	VTSFT-TC5533	M14 X 1,5	91,20	25,40	44,20	10,897	3	D6
	–	6140520	VTSFT-TC5535	M14 X 2	91,20	25,40	44,20	10,897	3	D7
6140521	VTSFT-TC5536	6140522	VTSFT-TC5536	M16 X 1,5	96,80	27,70	48,00	12,192	3	D6
5887099	VTSFT-TC5537	5887098	VTSFT-TC5537	M16 X 2	96,80	27,70	48,00	12,192	3	D7
6140523	VTSFT-TC5538	6140524	VTSFT-TC5538	M18 X 1,5	102,40	27,70	48,00	13,767	4	D6
6140525	VTSFT-TC5539	6140526	VTSFT-TC5539	M18 X 2,5	102,40	31,00	48,00	13,767	4	D7
6140527	VTSFT-TC5540	6140528	VTSFT-TC5540	M20 X 1,5	113,50	31,00	52,80	16,561	4	D6
6140529	VTSFT-TC5541	6140530	VTSFT-TC5541	M20 X 2,5	113,50	34,00	58,40	16,561	4	D7
	–	6140531	VTSFT-TC5542	M22 X 1,5	119,10	34,00	58,40	17,704	4	D6
	–	6140532	VTSFT-TC5543	M22 X 2,5	119,10	34,00	58,40	17,704	4	D7
	–	6140533	VTSFT-TC5544	M24 X 1,5	124,70	34,00	58,40	19,304	4	D6
	–	6140534	VTSFT-TC5545	M24 X 3	124,70	34,00	58,40	19,304	4	D8
	–	6140535	VTSFT-TC5546	M27 X 1,5	130,30	38,10	63,50	22,758	4	D7
	–	6140536	VTSFT-TC5547	M27 X 3	130,30	38,10	63,50	22,758	4	D8
	–	6140537	VTSFT-TC5548	M30 X 1,5	138,20	43,50	65,00	25,933	4	D6
	–	6140538	VTSFT-TC5549	M30 X 3,5	138,20	43,50	65,00	25,933	4	D9

VT-SFT TC • Form C Semi-Bottoming Chamfer • Metric • DIN 371, 374, and 376 • Tension/Compression Holders



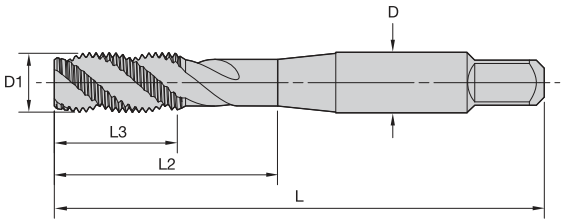


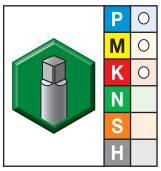


● first choice
○ alternate choice

grade WU41EG TiN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
6172434	VTSFT-TC6506	6172432	VTSFT-TC6506	M2 X 0,4	45	7	13	2,8	3	DIN 371	6H
6172438	VTSFT-TC6508	6172436	VTSFT-TC6508	M3 X 0,5	56	5	19	3,5	3	DIN 371	6H
6172442	VTSFT-TC6510	6172440	VTSFT-TC6510	M4 X 0,7	63	7	21	4,5	3	DIN 371	6H
6172446	VTSFT-TC6511	6172444	VTSFT-TC6511	M5 X 0,8	70	8	26	6,0	3	DIN 371	6H
6172450	VTSFT-TC6512	6172448	VTSFT-TC6512	M5 X 0,8	70	8	27	3,5	3	DIN 376	6H
6172464	VTSFT-TC6513		–	M6 X 0,75	80	10	34	4,5	3	DIN 374	6H
6172468	VTSFT-TC6514	6172466	VTSFT-TC6514	M6 X 1	80	10	30	6,0	3	DIN 371	6H
6172470	VTSFT-TC6515	6172469	VTSFT-TC6515	M6 X 1	80	10	34	4,5	3	DIN 376	6H
6172482	VTSFT-TC6516	6172481	VTSFT-TC6516	M8 X 0,75	90	13	37	6,0	3	DIN 374	6H
6172484	VTSFT-TC6517	6172483	VTSFT-TC6517	M8 X 1	90	13	37	6,0	3	DIN 374	6H
6172486	VTSFT-TC6518	6172485	VTSFT-TC6518	M8 X 1,25	90	13	37	8,0	3	DIN 371	6H
6172488	VTSFT-TC6519	6172487	VTSFT-TC6519	M8 X 1,25	90	13	37	6,0	3	DIN 376	6H
6172490	VTSFT-TC6520	6172489	VTSFT-TC6520	M10 X 0,75	90	15	40	7,0	3	DIN 374	6H
6172492	VTSFT-TC6540	6172491	VTSFT-TC6540	M10 X 1	90	15	40	7,0	3	DIN 374	6H
6172494	VTSFT-TC6522	6172493	VTSFT-TC6522	M10 X 1,25	100	15	44	7,0	3	DIN 374	6H
6172496	VTSFT-TC6550	6172495	VTSFT-TC6550	M10 X 1,5	100	15	41	10,0	3	DIN 371	6H
6172498	VTSFT-TC6524	6172497	VTSFT-TC6524	M10 X 1,5	100	15	44	7,0	3	DIN 376	6H
6172500	VTSFT-TC6525	6172499	VTSFT-TC6525	M12 X 1	100	13	50	9,0	3	DIN 374	6H
6172502	VTSFT-TC6526	6172501	VTSFT-TC6526	M12 X 1,25	100	13	50	9,0	3	DIN 374	6H
6172504	VTSFT-TC6527	6172503	VTSFT-TC6527	M12 X 1,5	100	13	50	9,0	3	DIN 374	6H
6172506	VTSFT-TC6528	6172505	VTSFT-TC6528	M12 X 1,75	110	18	55	9,0	3	DIN 376	6H
6172508	VTSFT-TC6529	6172507	VTSFT-TC6529	M14 X 1	100	15	41	11,0	4	DIN 374	6H
6172510	VTSFT-TC6530	6172509	VTSFT-TC6530	M14 X 1,25	100	15	41	11,0	4	DIN 374	6H
6172512	VTSFT-TC6536	6172511	VTSFT-TC6536	M14 X 1,5	100	15	41	11,0	4	DIN 374	6H
6172672	VTSFT-TC6532	6172671	VTSFT-TC6532	M14 X 2	110	20	50	11,0	3	DIN 376	6H
6172674	VTSFT-TC6534	6172673	VTSFT-TC6534	M16 X 1,5	100	15	45	12,0	4	DIN 374	6H
6172676	VTSFT-TC6564	6172675	VTSFT-TC6564	M16 X 2	110	20	55	12,0	4	DIN 376	6H
6172678	VTSFT-TC6537	6172677	VTSFT-TC6537	M18 X 1,5	110	17	55	14,0	4	DIN 374	6H
6172680	VTSFT-TC6538	6172679	VTSFT-TC6538	M18 X 2	125	25	61	14,0	4	DIN 374	6H
6172692	VTSFT-TC6539	6172691	VTSFT-TC6539	M18 X 2,5	125	25	61	14,0	4	DIN 376	6H
6172694	VTSFT-TC6541	6172693	VTSFT-TC6541	M20 X 1,5	125	17	56	16,0	4	DIN 374	6H
6172698	VTSFT-TC6543	6172697	VTSFT-TC6543	M20 X 2,5	140	25	65	16,0	4	DIN 376	6H
6172700	VTSFT-TC6544	6172699	VTSFT-TC6544	M22 X 1,5	125	18	61	18,0	4	DIN 374	6H
6172712	VTSFT-TC6545	6172711	VTSFT-TC6545	M22 X 2	140	25	66	18,0	4	DIN 374	6H
6172714	VTSFT-TC6546	6172713	VTSFT-TC6546	M22 X 2,5	140	25	66	18,0	4	DIN 376	6H
6172716	VTSFT-TC6547	6172715	VTSFT-TC6547	M24 X 1,5	140	20	67	18,0	4	DIN 374	6H
6172718	VTSFT-TC6548	6172717	VTSFT-TC6548	M24 X 2	140	20	67	18,0	4	DIN 374	6H
6172720	VTSFT-TC6549	6172719	VTSFT-TC6549	M24 X 3	160	30	77	18,0	4	DIN 376	6H
6172722	VTSFT-TC6551	6172721	VTSFT-TC6551	M27 X 1,5	140	20	65	20,0	4	DIN 374	6H
6172724	VTSFT-TC6552	6172723	VTSFT-TC6552	M27 X 3	160	33	85	20,0	4	DIN 376	6H
6172726	VTSFT-TC6554	6172725	VTSFT-TC6554	M30 X 1,5	150	22	68	20,0	4	DIN 374	6H
6172728	VTSFT-TC6555	6172727	VTSFT-TC6555	M30 X 2	150	22	68	22,0	4	DIN 374	6H
6172730	VTSFT-TC6556	6172729	VTSFT-TC6556	M30 X 3,5	180	35	87	22,0	4	DIN 376	6H
6172732	VTSFT-TC6558		–	M33 X 3,5	180	35	92	25,0	4	DIN 376	6H
6172734	VTSFT-TC6560	6172733	VTSFT-TC6560	M36 X 4	200	40	110	28,0	4	DIN 376	6H
6172736	VTSFT-TC6563	6172735	VTSFT-TC6563	M39 X 4	200	40	105	32,0	4	DIN 376	6H
6172738	VTSFT-TC6565	6172737	VTSFT-TC6565	M42 X 4,5	200	40	105	32,0	5	DIN 376	6H
6172740	VTSFT-TC6567	6172739	VTSFT-TC6567	M45 X 5	220	50	110	36,0	5	DIN 376	6H
6172742	VTSFT-TC6569	6172741	VTSFT-TC6569	M48 X 5	250	50	145	36,0	5	DIN 376	6H
6172744	VTSFT-TC6571	6172743	VTSFT-TC6571	M52 X 5	250	50	135	40,0	5	DIN 376	6H

VT-SFT TC • Form E Bottoming Chamfer • Metric • ANSI • Tension/Compression Holders

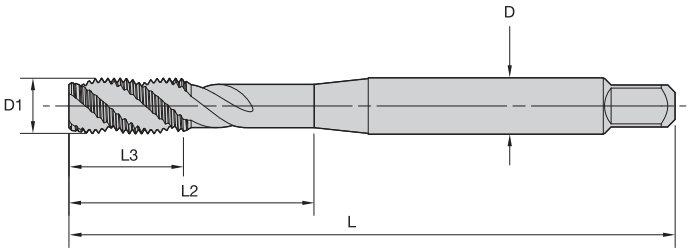


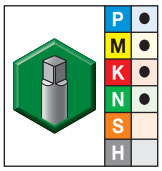


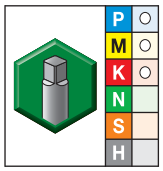
● first choice
○ alternate choice

grade WP49EG Oxide order #	catalogue #	D1 TPI	L	L3	L2	D	number of flutes	pitch diameter limit
6140343	VTSFT-TC5550	M3 X 0,5	49,30	14,80	19,10	3,582	2	D3
6140344	VTSFT-TC5551	M3,5 X 0,6	50,80	9,70	—	3,582	2	D4
6140345	VTSFT-TC5552	M4 X 0,7	54,10	9,70	19,40	4,267	3	D4
6140346	VTSFT-TC5553	M5 X 0,8	60,50	12,70	23,20	4,928	3	D4
6140347	VTSFT-TC5554	M6 X 1	63,50	16,00	25,50	6,477	3	D5
6140348	VTSFT-TC5555	M7 X 1	69,10	17,50	—	8,077	3	D5
6140349	VTSFT-TC5556	M8 X 1,25	69,10	17,50	28,50	8,077	3	D5
6140350	VTSFT-TC5557	M8 X 1	69,10	17,50	28,50	8,077	3	D5
6140391	VTSFT-TC5558	M10 X 1,5	74,70	19,10	31,90	9,678	3	D6
6140392	VTSFT-TC5559	M10 X 1,25	74,70	19,10	31,90	9,677	3	D5
6140393	VTSFT-TC5560	M12 X 1,75	85,90	23,90	—	9,322	3	D6
6140394	VTSFT-TC5561	M12 X 1,5	85,90	23,90	44,20	9,322	3	D5
6140395	VTSFT-TC5562	M12 X 1,25	85,90	23,90	44,20	9,322	3	D5
6140396	VTSFT-TC5563	M14 X 2	91,20	25,40	44,20	10,897	3	D7
6140397	VTSFT-TC5564	M14 X 1,5	91,20	25,40	44,20	10,897	3	D6
6140398	VTSFT-TC5565	M16 X 2	96,80	27,70	48,00	12,192	3	D7
6140399	VTSFT-TC5566	M16 X 1,5	96,80	27,70	48,00	12,192	3	D6

VT-SFT • Form E Bottoming Chamfer • Metric • DIN 371, 374, and 376





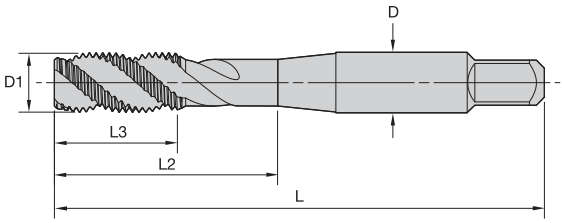


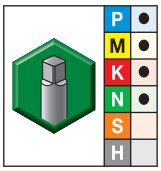
● first choice
○ alternate choice

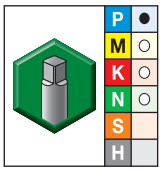
grade WP42EG TiCN		grade WP49EG Oxide									
order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
5387434	VTSFT6574	5387435	VTSFT6574	M3 X 0,5	56	8	18	3,5	2	DIN 371	6H
5387436	VTSFT6575	–		M4 X 0,7	63	11	21	4,5	3	DIN 371	6H
5387438	VTSFT6576	5387439	VTSFT6576	M5 X 0,8	70	12	25	6,0	3	DIN 371	6H
5387460	VTSFT6577	–		M6 X 1	80	12	30	6,0	3	DIN 371	6H
5387462	VTSFT6578	5387463	VTSFT6578	M8 X 1,25	90	15	35	8,0	3	DIN 371	6H
5387464	VTSFT6579	5387465	VTSFT6579	M10 X 1,5	100	18	39	10,0	3	DIN 371	6H
5387479	VTSFT6587	–		M12 X 1,5	100	21	39	9,0	3	DIN 374	6H
5387466	VTSFT6580	5387467	VTSFT6580	M12 X 1,75	110	21	44	9,0	3	DIN 376	6H
–		5387483	VTSFT6588	M14 X 1,5	100	21	47	11,0	3	DIN 374	6H
–		5387469	VTSFT6581	M14 X 2	110	24	52	11,0	3	DIN 376	6H
–		5387470	VTSFT6582	M16 X 2	110	24	51	12,0	3	DIN 376	6H
5387473	VTSFT6584	5387474	VTSFT6584	M20 X 2,5	140	30	64	16,0	4	DIN 376	6H

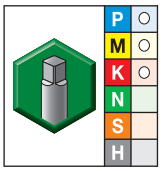
NOTE: Suggested for use in rigid and synchronous holders.

VT-SFT • Form C Semi-Bottoming Chamfer • Metric • ANSI







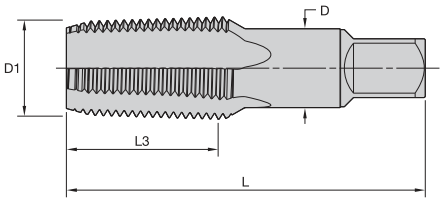


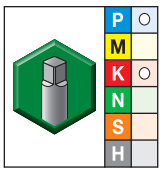
● first choice
○ alternate choice

grade WP42EG TiCN		grade WU41EG TiN		grade WP49EG Oxide								
order #	catalogue #	order #	catalogue #	order #	catalogue #	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	–		–	5357031	VTSFT5505	M3 X 0,5	49,20	14,80	19,10	3,581	2	D3
5357039	VTSFT5507		–	5357038	VTSFT5507	M3,5 X 0,6	50,50	9,70	18,00	3,581	2	D4
	–	5357056	VTSFT5509	5357054	VTSFT5509	M4 X 0,7	53,80	9,70	19,40	4,267	3	D4
	–		–	5357060	VTSFT5511	M5 X 0,8	60,30	12,70	23,20	4,928	3	D4
5357066	VTSFT5512		–		–	M5 X 0,8	60,30	12,70	23,20	4,928	3	D11
	–	5357069	VTSFT5513	5357067	VTSFT5513	M6 X 1	63,50	16,00	25,50	6,477	3	D5
5357083	VTSFT5514		–		–	M6 X 1	63,50	16,00	25,50	6,477	3	D11
	–		–	5357084	VTSFT5515	M7 X 1	69,20	17,50	29,30	8,077	3	D5
5357101	VTSFT5517	5357102	VTSFT5517	5357100	VTSFT5517	M8 X 1	68,70	17,50	28,50	8,077	3	D5
	–		–	5357106	VTSFT5519	M8 X 1,25	68,70	17,50	28,50	8,077	3	D5
5357123	VTSFT5520		–	5357121	VTSFT5520	M8 X 1,25	68,70	17,50	28,50	8,077	3	D11
5365567	VTSFT5521		–	5365566	VTSFT5521	M10 X 1	74,00	18,70	31,60	9,677	3	D5
5365590	VTSFT5522		–		–	M10 X 1	73,90	18,70	31,60	9,677	3	D11
5365592	VTSFT5523		–	5365591	VTSFT5523	M10 X 1,25	74,10	18,90	31,80	9,677	3	D5
5365598	VTSFT5525		–	5365597	VTSFT5525	M10 X 1,5	74,30	19,00	31,90	9,677	3	D6
5365612	VTSFT5526		–		–	M10 X 1,5	74,20	19,00	31,90	9,677	3	D11
5365614	VTSFT5527		–	5365613	VTSFT5527	M12 X 1,25	85,90	23,90	44,20	9,322	3	D5
5365621	VTSFT5529		–		–	M12 X 1,5	85,90	23,90	44,20	9,322	3	D6
5365624	VTSFT5530		–		–	M12 X 1,5	85,90	23,90	44,20	9,322	3	D11
	–		–	5365625	VTSFT5531	M12 X 1,75	85,90	23,90	44,20	9,322	3	D6
	–		–	5365629	VTSFT5532	M12 X 1,75	85,90	23,90	44,20	9,322	3	D11
	–		–	5365635	VTSFT5535	M14 X 2	91,20	25,40	44,20	10,897	3	D7
	–		–	5365637	VTSFT5536	M16 X 1,5	96,80	27,70	48,00	12,192	3	D6
	–		–	5365640	VTSFT5537	M16 X 2	96,80	27,70	48,00	12,192	3	D7
5365650	VTSFT5540		–		–	M20 X 1,5	113,50	31,00	52,80	16,561	4	D6
	–		–	5365651	VTSFT5541	M20 X 2,5	113,50	31,00	52,80	16,561	4	D7
	–		–	5365656	VTSFT5545	M24 X 3	124,70	34,00	58,40	19,304	4	D8
	–		–	5365660	VTSFT5549	M30 X 3,5	138,20	43,50	65,00	25,933	4	D9

NOTE: Refer to tables on pages D32 for the recommended pitch diameter limit for 6H class of fit.
VariTap for 6H class of fit is suitable for MJ aerospace internal threading applications.

VT-STR • NPT • Standard Chamfer • Pipe Taps





● first choice
○ alternate choice

grade WU40EG Bright				
order #	catalogue #	D1 TPI	number of flutes	thread type
5629646	VTSTR8001	1/8 - 27	4	NPT
5629647	VTSTR8002	1/4 - 18	4	NPT
5629648	VTSTR8003	3/8 - 18	4	NPT
5629649	VTSTR8004	1/2 - 14	4	NPT
5629904	VTSTR8005	3/4 - 14	5	NPT

Application Data • VariTap • HSS-E • Metric

Material Group		Through Holes					Blind Holes				
				Range — m/min					Range — m/min		
		Tap Style	Grade	min	Starting Value	max	Tap Style	Grade	min	Starting Value	max
P	P1	VT-SPO	WP42EG, WU41EG	21	27	34	VT-SFT	WP42EG, WU41EG	13	18	26
		VT-SPO	WP49EG	10	14	17	VT-SFT	WP49EG	6	9	13
	P2	VT-SPO	WP42EG, WU41EG	16	21	27	VT-SFT	WP42EG, WU41EG	11	15	22
		VT-SPO	WP49EG	8	11	13	VT-SFT	WP49EG	4	6	9
	P3	VT-SPO	WP42EG, WU41EG	9	12	15	VT-SFT	WP42EG, WU41EG	6	9	13
		VT-SPO	WP49EG	5	6	8	VT-SFT	WP49EG	2	3	4
		VT-STR NPT	WU41EG	5	6	8	VT-STR NPT	WU41EG	5	6	8
M	M1	VT-SPO	WP42EG, WU41EG	9	12	15	VT-SFT	WP42EG, WU41EG	6	9	13
		VT-SPO	WP49EG	5	6	8	VT-SFT	WP49EG	2	3	4
		VT-SFT NPT	WU41EG	5	6	8	VT-SFT NPT	WU41EG	5	6	8
		VT-SFT NPT	WP49EG	2	3	4	VT-SFT NPT	WP49EG	2	3	4
	M3	VT-SPO	WP42EG, WU41EG	7	9	11	VT-SFT	WP42EG, WU41EG	4	6	9
		VT-SPO	WP49EG	3	5	6	VT-SFT	WP49EG	2	3	4
K	K1	VT-STR NPT	WU41EG	10	14	17	VT-STR NPT	WU41EG	10	14	17
	K2	VT-SPO	WP42EG, WU41EG	21	27	34	VT-SFT	WP42EG, WU41EG	13	18	26
		VT-SPO	WP49EG	10	14	17	VT-SFT	WP49EG	6	9	13
N	N1	VT-SPO	WP42EG, WU41EG	34	46	57	VT-SFT	WP42EG, WU41EG	23	34	48
	N2	VT-SPO	WP42EG, WU41EG	30	40	50	VT-SFT	WP42EG, WU41EG	19	27	39
	N4	VT-SPO	WP42EG, WU41EG	7	9	11	VT-SFT	WP42EG, WU41EG	4	6	9

** Grades: WP42EG = TiCN*
WU41EG = TiN
WP49EG = oxide

WIDIA™ TAP/DRILL COMBINATIONS:

VariDrill™/VariTap™

MATERIALS

P M K N S

VERSATILE:

VariDrill™ drilling tools, in combination with VariTap™ tapping tools, are designed for productivity in an array of different materials. These tools feature strong geometries that are ideal for small-batch and varied production.

For more than 95 years, WIDIA has defined excellence in innovation, technology, and customer service. As an industry-leading manufacturer of cutting tools, WIDIA offers a complete portfolio of precision-engineered products. With drilling, tapping, and tooling systems products, you will find everything you need from one single source.

- Extensive Portfolio
- Expertise
- Customized Solutions

Victory™ Tap

HSS-E-PM • Victory Taps

Victory HSS-E-PM Taps feature material-specific geometries and grades capable of working in a wider application range than solid carbide taps.

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Optimized flute designs
Better chip evacuation

Application-specific coatings
Extremely high wear resistance, longer tool life

HSS-E-PM powder metallurgy substrate
Improved wear characteristics, longer tool life

Optimum choice for customers seeking consistency and optimal performance in a wide variety of applications and materials.

GRADES

	WP31MG	WS32MG	WN35MG	WU32MG	WS34MG	WH36MG	WS39MG	WN48MG	WN44EG
P	●			●		●			○
M				○	●				●
K				●					
N				●	○			●	●
S	○	●	●	●	●	○	●		
H		●							

RELIABLE AND CONSISTENT

WIDIA™ GTD™

PRODUCT

Victory™ HSS-E-PM Taps deliver reliability and consistent performance on a wide range of applications

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

MATERIALS

P M K N S

APPLICATIONS

BLIND HOLE

THROUGH HOLE

HSS-E-PM

DIN 371

DIN 374

DIN 376

ANSI

FLOOD COOLANT: TAPPING

THROUGH COOLANT: RADIAL: TAPPING

THROUGH COOLANT: AXIAL: TAPPING

SERIES	SIZE RANGE	DIMENSIONS
GT00, GT14, GT16	M and MF: M3 to M12	DIN
GT02, GT04, GT10, GT12, GT80	M and MF: M3 to M20	DIN
GT06	M and MF: M6 to M16	DIN
GT2x	M and MF: M3 to M42	ANSI & DIN
	UNC and UNF: #2 to 3/4"	ANSI
	UNC and UNF: #6 to 1/2"	DIN/ANSI
GT3x	M and MF: M3 to M42	ANSI & DIN
	UNC and UNF: #2 to 1"	ANSI
	UNC and UNF: #6 to 1/2"	DIN/ANSI
GT4x	M and MF: M4 to M22	DIN
	UNC and UNF: #10 to 3/4"	ANSI
	UNC and UNF: #6 to 1/2"	DIN/ANSI
GT5x	M: M24 to M42	DIN
GT6x	M and MF: M2.5 to M12	ANSI
	UNC and UNF: #2 to 1"	ANSI
GT9x	M and MF: M2.5 to M12	ANSI
	UNC and UNF: #2 to 3/4"	ANSI
GT70	M and MF: M3 to M16	DIN/ANSI
GT7x & GT8x	M and MF: M3 to M12	DIN/ANSI
	UNC and UNF: #2 to 1/2"	DIN/ANSI

Shank Style

ANSI, DIN, JIS, and DIN/ANSI precision ground

Tap Drill Size Charts • Thread Cutting • UNC, UNF, and 8-Pitch

tap size	Threads per Inch			65% thread						70% thread						75% thread					
				Metric			Inch			Metric			Inch			Metric			Inch		
	UNC	UNF	8-pitch	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill
#0	–	80	–	1.20	**1.26**	1.30	0.0472	**0.0494**	0.0512	1.20	**1.24**	1.30	0.0472	**0.0486**	0.0512	1.20	**1.21**	1.30	0.0472	**0.0478**	0.0512
#1	64	–	–	1.50	**1.52**	1.60	0.0591	**0.0598**	0.0630	1.40	**1.49**	1.50	0.0551	**0.0588**	0.0591	1.40	**1.47**	1.50	0.0551	**0.0578**	0.0591
	–	72	–	1.50	**1.56**	1.60	0.0591	**0.0613**	0.0630	1.50	**1.53**	1.60	0.0591	**0.0604**	0.0630	1.50	**1.51**	1.60	0.0591	**0.0595**	0.0630
#2	56	–	–	1.80	**1.80**	1.80	0.0709	**0.0709**	0.0709	1.70	**1.77**	1.80	0.0669	**0.0698**	0.0709	1.70	**1.74**	1.80	0.0669	**0.0686**	0.0709
	–	64	–	1.80	**1.85**	1.90	0.0709	**0.0728**	0.0748	1.80	**1.82**	1.90	0.0709	**0.0718**	0.0748	1.80	**1.80**	1.80	0.0669	**0.0708**	0.0709
#3	48	–	–	2.00	**2.07**	2.10	0.0787	**0.0814**	0.0827	2.00	**2.03**	2.10	0.0787	**0.0801**	0.0827	2.00	**2.00**	2.00	0.0787	**0.0787**	0.0787
	–	56	–	2.10	**2.13**	2.20	0.0827	**0.0839**	0.0866	2.10	**2.10**	2.10	0.0827	**0.0828**	0.0866	2.00	**2.07**	2.10	0.0787	**0.0816**	0.0827
#4	40	–	–	2.30	**2.31**	2.38	0.0906	**0.0909**	0.0938	2.20	**2.27**	2.30	0.0866	**0.0893**	0.0906	2.20	**2.23**	2.30	0.0866	**0.0876**	0.0906
	–	48	–	2.40	**2.40**	2.40	0.0938	**0.0944**	0.0945	2.30	**2.36**	2.38	0.0906	**0.0931**	0.0938	2.30	**2.33**	2.38	0.0906	**0.0917**	0.0938
#5	40	–	–	2.64	**2.64**	2.64	0.1024	**0.1039**	0.1040	2.60	**2.60**	2.60	0.1015	**0.1023**	0.1024	2.50	**2.56**	2.58	0.0984	**0.1006**	0.1015
	–	44	–	2.64	**2.69**	2.70	0.1040	**0.1058**	0.1063	2.64	**2.65**	2.70	0.1040	**0.1043**	0.1063	2.60	**2.61**	2.64	0.1024	**0.1029**	0.1040
#6	32	–	–	2.82	**2.83**	2.87	0.1100	**0.1116**	0.1130	2.78	**2.78**	2.78	0.1094	**0.1096**	0.1102	2.71	**2.73**	2.78	0.1065	**0.1076**	0.1094
	–	40	–	2.95	**2.97**	3.00	0.1160	**0.1169**	0.1181	2.90	**2.93**	2.95	0.1142	**0.1153**	0.1160	2.87	**2.89**	2.90	0.1130	**0.1136**	0.1142
#8	32	–	–	3.50	**3.50**	3.50	0.1360	**0.1376**	0.1378	3.40	**3.44**	3.46	0.1339	**0.1356**	0.1360	3.30	**3.39**	3.40	0.1299	**0.1336**	0.1339
	–	36	–	3.57	**3.57**	3.57	0.1378	**0.1405**	0.1406	3.50	**3.52**	3.57	0.1378	**0.1387**	0.1406	3.46	**3.48**	3.50	0.1360	**0.1369**	0.1378
#10	24	–	–	3.90	**3.93**	3.97	0.1535	**0.1548**	0.1563	3.80	**3.86**	3.90	0.1496	**0.1521**	0.1535	3.73	**3.79**	3.80	0.1470	**0.1494**	0.1496
	–	32	–	4.10	**4.16**	4.20	0.1614	**0.1636**	0.1654	4.10	**4.10**	4.10	0.1614	**0.1616**	0.1654	4.04	**4.05**	4.09	0.1590	**0.1596**	0.1610
#12	24	–	–	4.50	**4.59**	4.60	0.1772	**0.1808**	0.1811	4.50	**4.52**	4.60	0.1772	**0.1781**	0.1811	4.40	**4.46**	4.50	0.1732	**0.1754**	0.1772
	–	28	–	4.70	**4.72**	4.76	0.1850	**0.1858**	0.1875	4.62	**4.66**	4.70	0.1820	**0.1835**	0.1850	4.60	**4.60**	4.60	0.1811	**0.1812**	0.1820
1/4	20	–	–	5.20	**5.28**	5.30	0.2047	**0.2078**	0.2087	5.20	**5.20**	5.20	0.2031	**0.2045**	0.2047	5.11	**5.11**	5.11	0.2010	**0.2013**	0.2031
	–	28	–	5.56	**5.58**	5.60	0.2188	**0.2198**	0.2205	5.50	**5.53**	5.56	0.2165	**0.2175**	0.2188	5.41	**5.47**	5.50	0.2130	**0.2152**	0.2165
5/16	18	–	–	6.75	**6.75**	6.75	0.2656	**0.2656**	0.2656	6.63	**6.65**	6.70	0.2610	**0.2620**	0.2638	6.53	**6.56**	6.60	0.2570	**0.2584**	0.2598
	–	24	–	7.00	**7.04**	7.10	0.2756	**0.2773**	0.2795	6.90	**6.98**	7.00	0.2717	**0.2746**	0.2756	6.90	**6.91**	7.00	0.2717	**0.2719**	0.2756
3/8	16	–	–	8.10	**8.18**	8.20	0.3189	**0.3222**	0.3228	8.00	**8.08**	8.10	0.3150	**0.3182**	0.3189	7.94	**7.98**	8.00	0.3125	**0.3141**	0.3150
	–	24	–	8.60	**8.63**	8.70	0.3386	**0.3398**	0.3425	8.50	**8.56**	8.60	0.3346	**0.3371**	0.3386	8.43	**8.49**	8.50	0.3320	**0.3344**	0.3346
7/16	14	–	–	9.53	**9.58**	9.60	0.3750	**0.3772**	0.3780	9.40	**9.46**	9.50	0.3701	**0.3726**	0.3740	9.30	**9.34**	9.35	0.3661	**0.3679**	0.3680
	–	20	–	10.00	**10.04**	10.10	0.3937	**0.3953**	0.3976	9.92	**9.96**	10.00	0.3906	**0.3920**	0.3937	9.80	**9.88**	9.90	0.3858	**0.3888**	0.3898
1/2	13	–	–	11.00	**11.05**	11.10	0.4331	**0.4351**	0.4370	10.90	**10.92**	11.00	0.4291	**0.4301**	0.4331	10.80	**10.80**	10.80	0.4219	**0.4251**	0.4252
	–	20	–	11.60	**11.63**	11.70	0.4528	**0.4578**	0.4606	11.51	**11.55**	11.60	0.4528	**0.4545**	0.4606	11.40	**11.46**	11.50	0.4488	**0.4513**	0.4528
9/16	12	–	–	12.50	**12.50**	12.50	0.4921	**0.4921**	0.4921	12.30	**12.36**	12.40	0.4844	**0.4867**	0.4882	12.20	**12.23**	12.30	0.4803	**0.4813**	0.4843
	–	18	–	13.10	**13.10**	13.10	0.5118	**0.5156**	0.5157	13.00	**13.00**	13.00	0.5118	**0.5120**	0.5157	12.80	**12.91**	13.00	0.5039	**0.5084**	0.5118
5/8	11	–	–	13.80	**13.93**	14.00	0.5433	**0.5482**	0.5512	13.50	**13.78**	13.80	0.5315	**0.5423**	0.5433	13.50	**13.63**	13.80	0.5315	**0.5364**	0.5433
	–	18	–	14.50	**14.68**	15.00	0.5709	**0.5781**	0.5906	14.50	**14.59**	15.00	0.5709	**0.5745**	0.5906	14.50	**14.50**	14.50	0.5709	**0.5709**	0.5709
3/4	10	–	–	16.50	**16.91**	17.00	0.6496	**0.6656**	0.6693	16.50	**16.74**	17.00	0.6496	**0.6591**	0.6693	16.50	**16.58**	17.00	0.6496	**0.6526**	0.6560
	–	16	–	17.50	**17.71**	18.00	0.6890	**0.6972**	0.7087	17.50	**17.61**	18.00	0.6890	**0.6932**	0.7087	17.50	**17.50**	17.50	0.6890	**0.6891**	0.6969
7/8	9	–	–	19.50	**19.84**	20.00	0.7677	**0.7812**	0.7874	19.50	**19.66**	20.00	0.7677	**0.7740**	0.7874	19.00	**19.48**	19.50	0.7660	**0.7668**	0.7677
	–	14	–	20.50	**20.69**	21.00	0.8071	**0.8147**	0.8268	20.50	**20.58**	21.00	0.8071	**0.8101**	0.8268	20.00	**20.46**	20.50	0.8012	**0.8054**	0.8071
1	8	–	–	22.50	**22.72**	22.77	0.8858	**0.8945**	0.8965	22.50	**22.51**	22.77	0.8858	**0.8863**	0.8965	22.23	**22.31**	22.44	0.8750	**0.8782**	0.8840
	–	12	–	23.50	**23.61**	23.81	0.9252	**0.9296**	0.9375	23.42	**23.48**	23.50	0.9220	**0.9242**	0.9252	23.30	**23.34**	23.42	0.9173	**0.9188**	0.9220
1-1/8	7	–	–	25.50	**25.51**	25.60	1.0039	**1.0044**	1.0080	25.07	**25.28**	25.40	0.9870	**0.9951**	1.0000	25.00	**25.04**	25.07	0.9843	**0.9858**	0.9870
	–	12	–	26.70	**26.79**	27.00	1.0512	**1.0546**	1.0610	26.59	**26.65**	26.70	1.0470	**1.0492**	1.0512	26.50	**26.51**	26.59	1.0433	**1.0438**	1.0470
	–	–	8	25.81	**25.89**	26.00	1.0160	**1.0195**	1.0236	25.67	**25.69**	25.81	1.0110	**1.0113**	1.0160	25.40	**25.48**	25.50	1.0000	**1.0032**	1.0039
1-1/4	7	–	–	28.58	**28.69**	29.00	1.1250	**1.1294**	1.1417	28.18	**28.45**	28.50	1.1090	**1.1201**	1.1220	28.18	**28.21**	28.50	1.1090	**1.1108**	1.1220
	–	12	–	29.77	**29.96**	30.00	1.1720	**1.1796**	1.1811	29.77	**29.83**	30.00	1.1720	**1.1742**	1.1811	29.50	**29.69**	29.73	1.1614	**1.1688**	1.1720
	–	–	8	29.00	**29.07**	29.50	1.1417	**1.1445**	1.1560	28.58	**28.86**	29.00	1.1250	**1.1363**	1.1417	28.58	**28.66**	29.00	1.1250	**1.1282**	1.1417
1-3/8	6	–	–	31.00	**31.35**	31.50	1.2200	**1.2343**	1.2402	31.00	**31.08**	31.50	1.2200	**1.2235**	1.2402	30.56	**30.80**	30.96	1.2030	**1.2126**	1.2190
	–	12	–	33.00	**33.14**	33.34	1.2992	**1.3046**	1.3130	33.00	**33.00**	33.00	1.2992	**1.2992**	1.2992	32.54	**32.86**	32.94	1.2810	**1.2938**	1.2970
	–	–	8	32.00	**32.24**	32.50	1.2598	**1.2695**	1.2795	32.00	**32.04**	32.50	1.2598	**1.2613**	1.2795	31.75	**31.83**	32.00	1.2500	**1.2532**	1.2598
1-1/2	6	–	–	34.50	**34.53**	34.93	1.3583	**1.3593**	1.3750	34.13	**34.25**	34.50	1.3440	**1.3485**	1.3583	33.73	**33.98**	34.00	1.3280	**1.3376**	1.3386
	–	12	–	36.12	**36.31**	36.50	1.4220	**1.4296**	1.4375	36.12	**36.18**	36.50	1.4220	**1.4242**	1.4375	36.00	**36.04**	36.12	1.4173	**1.4188**	1.4220
	–	–	8	35.00	**35.42**	35.50	1.3780	**1.3945**	1.3976	35.00	**35.21**	35.50	1.3780	**1.3863**	1.3976	35.00	**35.01**	35.50	1.3780	**1.3782**	1.3976
1-5/8	–	–	8	38.50	**38.59**	39.00	1.5157	**1.5195**	1.5354	38.10	**38.39**	38.46	1.5000	**1.5113**	1.5140	38.10	**38.18**	38.46	1.5000	**1.5032**	1.5140
1-3/4	5	–	–	40.00	**40.16**	41.00	1.5750	**1.5811**	1.6140	39.50	**39.83**	40.00	1.5551	**1.5681**	1.5748	39.50	**39.50**	39.50	1.5551	**1.5552**	1.5748
	–	–	8	41.00	**41.77**	42.00	1.6140	**1.6445**	1.6540	41.00	**41.56**	42.00	1.6140	**1.6363**	1.6540	41.00	**41.36**	42.00	1.6140	**1.6282**	1.6540
1-7/8	–	–	8	44.00	**44.94**	45.00	1.7320	**1.7695**	1.7720	44.00	**44.74**	45.00	1.7320	**1.7613**	1.7720	44.00	**44.53**	45.00	1.7320	**1.7532**	1.7720
2	4 1/2	–	–	46.00	**46.03**	47.00	1.8110	**1.8124**	1.8500	45.00	**45.67**	46.00	1.7720	**1.7979**	1.8110	45.00	**45.30**	46.00	1.7720	**1.7835**	1.8110
	–	–	8	48.00	**48.12**	49.00	1.8900	**1.8945**	1.9290	47.00	**47.91**	48.00	1.8500	**1.8863**	1.8900	47.00	**47.71**	48.00	1.8500	**1.8782**	1.8900
2-1/4	4 1/2	–	–	52.00	**52.38**	53.00	2.0470	**2.0624**	2.0870	52.00	**52.02**	53.00	2.0470	**2.0479**	2.0870	51.00	**51.65**	52.00	2.0080	**2.0335**	2.0470
	–	–	8	54.00	**54.47**	55.00	2.1260	**2.1445**	2.1650	54.00	**54.26**	55.00	2.1260	**2.1363**	2.1650	54.00	**54.06**	55.00	2.1260	**2.1282**	2.1650
2-1/2	4	–	–	58.00	**58.14**	59.00	2.2840	**2.2889**	2.3230	57.00	**57.73**	58.00	2.2440	**2.2727**	2.2840	57.00	**57.31**	58.00	2.2440	**2.2564**	2.2840
	–	–	8	60.00	**60.82**	61.00	2.3620	**2.3945**	2.4020	60.00	**60.61**	61.00	2.3620	**2.3863**	2.4020	60.00	**60.41**	61.00	2.3620	**2.3782**	2.4020

Tap Drill Size Charts • Thread Cutting • M and MF

tap size	pitch		65% thread						70% thread						75% thread					
			Metric			Inch			Metric			Inch			Metric			Inch		
	M	MF	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill
M1.6	0.35	–	1.20	1.30	1.30	0.0512	0.0512	0.0512	1.20	1.28	1.30	0.0472	0.0504	0.0512	1.20	1.26	1.30	0.0472	0.0496	0.0512
M1.7	0.35	–	1.40	1.40	1.40	0.0551	0.0551	0.0551	1.32	1.38	1.40	0.0520	0.0543	0.0550	1.32	1.36	1.40	0.0520	0.0535	0.0550
M1.8	0.35	–	1.50	1.50	1.50	0.0591	0.0591	0.0591	1.40	1.48	1.50	0.0551	0.0583	0.0591	1.40	1.46	1.50	0.0551	0.0575	0.0591
M2	0.4	–	1.60	1.66	1.70	0.0630	0.0654	0.0669	1.60	1.64	1.70	0.0630	0.0646	0.0669	1.60	1.61	1.70	0.0630	0.0634	0.0669
M2.2	0.45	–	1.80	1.82	1.90	0.0709	0.0717	0.0748	1.70	1.79	1.80	0.0669	0.0705	0.0709	1.70	1.76	1.80	0.0669	0.0693	0.0709
M2.5	0.45	–	2.10	2.12	2.20	0.0827	0.0835	0.0866	2.00	2.09	2.10	0.0787	0.0823	0.0827	2.00	2.06	2.10	0.0787	0.0811	0.0827
M2.6	0.45	–	2.20	2.22	2.30	0.0866	0.0874	0.0906	2.10	2.19	2.20	0.0827	0.0862	0.0866	2.10	2.16	2.20	0.0827	0.0850	0.0866
M3	0.5	–	2.58	2.58	2.58	0.1015	0.1016	0.1024	2.50	2.55	2.58	0.0984	0.1004	0.1015	2.50	2.51	2.58	0.0984	0.0988	0.1015
	–	0.35	2.70	2.70	2.70	0.1063	0.1063	0.1063	2.64	2.68	2.70	0.1040	0.1055	0.1063	2.64	2.66	2.70	0.1040	0.1047	0.1063
M3.5	0.6	–	2.95	2.99	3.00	0.1160	0.1177	0.1181	2.95	2.95	3.00	0.1160	0.1161	0.1181	2.90	2.92	2.95	0.1142	0.1150	0.1160
M4	0.7	–	3.40	3.41	3.46	0.1339	0.1343	0.1360	3.30	3.36	3.40	0.1299	0.1323	0.1339	3.30	3.32	3.40	0.1299	0.1307	0.1339
	–	0.5	3.57	3.58	3.60	0.1406	0.1409	0.1417	3.50	3.54	3.57	0.1378	0.1394	0.1406	3.50	3.51	3.57	0.1378	0.1382	0.1406
M4.5	0.75	–	3.80	3.87	3.90	0.1496	0.1524	0.1535	3.80	3.82	3.90	0.1496	0.1504	0.1535	3.73	3.77	3.80	0.1470	0.1484	0.1496
M5	0.8	–	4.30	4.32	4.37	0.1693	0.1701	0.1719	4.22	4.27	4.30	0.1660	0.1681	0.1693	4.22	4.22	4.30	0.1660	0.1661	0.1693
	–	0.5	4.50	4.58	4.60	0.1772	0.1803	0.1811	4.50	4.54	4.60	0.1772	0.1787	0.1811	4.50	4.51	4.60	0.1772	0.1776	0.1811
M6	1	–	5.16	5.16	5.16	0.2031	0.2031	0.2031	5.00	5.09	5.10	0.1969	0.2004	0.2008	5.00	5.03	5.10	0.1969	0.1980	0.2008
	–	0.75	5.30	5.37	5.40	0.2087	0.2114	0.2126	5.30	5.32	5.40	0.2087	0.2094	0.2126	5.20	5.27	5.30	0.2047	0.2075	0.2087
M7	1	–	6.10	6.16	6.20	0.2402	0.2425	0.2441	6.00	6.09	6.10	0.2362	0.2398	0.2402	6.00	6.03	6.10	0.2362	0.2374	0.2402
M8	1.25	–	6.90	6.94	7.00	0.2717	0.2732	0.2756	6.80	6.86	6.90	0.2677	0.2701	0.2717	6.75	6.78	6.80	0.2656	0.2669	0.2677
	–	1	7.15	7.16	7.20	0.2813	0.2819	0.2835	7.00	7.09	7.10	0.2756	0.2791	0.2795	7.00	7.03	7.10	0.2756	0.2768	0.2795
	–	0.75	7.30	7.37	7.40	0.2874	0.2902	0.2913	7.30	7.32	7.40	0.2874	0.2882	0.2913	7.20	7.27	7.30	0.2835	0.2862	0.2874
M10	1.5	–	8.70	8.73	8.73	0.3425	0.3437	0.3438	8.60	8.64	8.70	0.3386	0.3402	0.3425	8.50	8.54	8.60	0.3346	0.3362	0.3386
	–	1.25	8.90	8.94	9.00	0.3504	0.3520	0.3543	8.80	8.86	8.90	0.3465	0.3488	0.3504	8.73	8.78	8.80	0.3438	0.3457	0.3465
	–	1	9.13	9.16	9.20	0.3594	0.3606	0.3622	9.00	9.09	9.10	0.3543	0.3579	0.3583	9.00	9.03	9.10	0.3543	0.3555	0.3583
	–	0.75	9.35	9.37	9.40	0.3680	0.3689	0.3701	9.30	9.32	9.35	0.3661	0.3669	0.3680	9.20	9.27	9.30	0.3622	0.3650	0.3661
M12	1.75	–	10.50	10.52	10.60	0.4134	0.4142	0.4173	10.40	10.41	10.50	0.4094	0.4098	0.4134	10.30	10.30	10.30	0.4055	0.4055	0.4055
	–	1.5	10.72	10.73	10.80	0.4219	0.4224	0.4252	10.60	10.64	10.70	0.4173	0.4189	0.4213	10.50	10.54	10.60	0.4134	0.4150	0.4173
	–	1.25	10.90	10.94	11.00	0.4291	0.4307	0.4331	10.80	10.86	10.90	0.4252	0.4276	0.4291	10.72	10.78	10.80	0.4219	0.4244	0.4252
	–	1	11.15	11.16	11.20	0.4375	0.4394	0.4409	11.00	11.09	11.10	0.4331	0.4366	0.4370	11.00	11.03	11.10	0.4331	0.4343	0.4370
M14	2	–	12.30	12.31	12.40	0.4844	0.4846	0.4882	12.10	12.18	12.20	0.4764	0.4795	0.4803	12.00	12.05	12.10	0.4724	0.4744	0.4764
	–	1.5	12.70	12.73	12.80	0.5000	0.5012	0.5039	12.60	12.64	12.70	0.4961	0.4976	0.5000	12.50	12.54	12.60	0.4921	0.4937	0.4961
M16	2	–	14.20	14.31	14.50	0.5591	0.5634	0.5709	14.00	14.18	14.20	0.5512	0.5583	0.5591	14.00	14.05	14.20	0.5512	0.5531	0.5591
	–	1.5	14.50	14.73	15.00	0.5709	0.5799	0.5906	14.50	14.64	15.00	0.5709	0.5764	0.5906	14.50	14.54	15.00	0.5709	0.5724	0.5906
M18	2.5	–	15.80	15.89	16.00	0.6220	0.6256	0.6299	15.50	15.73	15.80	0.6102	0.6193	0.6220	15.50	15.56	15.80	0.6102	0.6126	0.6220
	–	1.5	16.50	16.73	17.00	0.6496	0.6587	0.6693	16.50	16.64	17.00	0.6496	0.6551	0.6693	16.50	16.54	17.00	0.6496	0.6512	0.6693
M20	2.5	–	17.50	17.89	18.00	0.6890	0.7043	0.7087	17.50	17.73	18.00	0.6890	0.6980	0.7087	17.50	17.56	18.00	0.6890	0.6913	0.7087
	–	1.5	18.50	18.73	19.00	0.7283	0.7374	0.7480	18.50	18.64	19.00	0.7283	0.7339	0.7480	18.50	18.54	19.00	0.7283	0.7299	0.7480
	–	1	19.00	19.16	19.50	0.7480	0.7543	0.7677	19.00	19.09	19.50	0.7480	0.7516	0.7677	19.00	19.03	19.50	0.7480	0.7492	0.7677
M22	2.5	–	19.50	19.89	20.00	0.7677	0.7831	0.7874	19.50	19.73	20.00	0.7677	0.7768	0.7874	19.50	19.56	20.00	0.7677	0.7701	0.7874
	–	2	20.00	20.31	20.50	0.7874	0.7996	0.8071	20.00	20.18	20.50	0.7874	0.7945	0.8071	20.00	20.05	20.50	0.7874	0.7894	0.8071
	–	1.5	20.50	20.73	21.00	0.8071	0.8161	0.8268	20.50	20.64	21.00	0.8071	0.8126	0.8268	20.50	20.54	21.00	0.8071	0.8087	0.8268
M24	3	–	21.43	21.47	21.50	0.8440	0.8453	0.8460	21.15	21.27	21.33	0.8327	0.8374	0.8398	21.00	21.08	21.15	0.8268	0.8299	0.8327
	–	2	22.23	22.31	22.44	0.8750	0.8783	0.8840	22.00	22.18	22.23	0.8661	0.8732	0.8750	22.00	22.05	22.23	0.8661	0.8681	0.8750
	–	1.5	22.50	22.73	22.77	0.8858	0.8949	0.8965	22.50	22.64	22.77	0.8858	0.8913	0.8965	22.50	22.54	22.77	0.8858	0.8874	0.8965
M27	3	–	24.30	24.47	24.50	0.9567	0.9634	0.9646	24.00	24.27	24.30	0.9449	0.9555	0.9567	24.00	24.08	24.30	0.9449	0.9480	0.9567
	–	2	25.07	25.31	25.40	0.9870	0.9965	1.0000	25.07	25.18	25.40	0.9870	0.9913	1.0000	25.00	25.05	25.07	0.9843	0.9862	0.9870
	–	1.5	25.67	25.73	25.81	1.0110	1.0130	1.0160	25.61	25.64	25.65	1.0080	1.0094	1.0098	25.50	25.54	25.60	1.0039	1.0055	1.0080
M30	3.5	–	27.00	27.04	27.50	1.0630	1.0646	1.0827	26.70	26.82	27.00	1.0512	1.0559	1.0610	26.59	26.59	26.59	1.0433	1.0469	1.0470
	–	2	28.18	28.31	28.50	1.1090	1.1146	1.1220	28.18	28.18	28.18	1.1090	1.1094	1.1220	28.00	28.05	28.10	1.1024	1.1043	1.1063
	–	1.5	28.58	28.73	29.00	1.1250	1.1311	1.1417	28.58	28.64	29.00	1.1250	1.1276	1.1417	28.50	28.54	28.58	1.1220	1.1236	1.1250
M33	3.5	–	30.00	30.04	30.16	1.1811	1.1827	1.1875	29.77	29.82	30.00	1.1720	1.1740	1.1811	29.50	29.59	29.73	1.1614	1.1650	1.1720
	–	2	31.00	31.31	31.50	1.2200	1.2327	1.2402	31.00	31.18	31.50	1.2200	1.2276	1.2402	31.00	31.05	31.50	1.2200	1.2224	1.2402
M36	4	–	32.54	32.62	32.94	1.2810	1.2843	1.2970	32.00	32.36	32.50	1.2598	1.2740	1.2795	32.00	32.10	32.50	1.2598	1.2638	1.2795
	–	3	33.40	33.47	33.50	1.3130	1.3177	1.3189	33.00	33.27	33.34	1.2992	1.3098	1.3130	33.00	33.08	33.34	1.2992	1.3024	1.3130
	–	2	34.13	34.31	34.50	1.3440	1.3508	1.3583	34.13	34.18	34.50	1.3440	1.3457	1.3583	34.00	34.05	34.13	1.3386	1.3406	1.3440
M39	4	–	35.50	35.62	35.72	1.3976	1.4024	1.4060	35.00	35.36	35.50	1.3780	1.3921	1.3976	35.00	35.10	35.50	1.3780	1.3819	1.3976
	–	2	37.31	37.31	37.31	1.4567	1.4689	1.4690	37.00	37.18	37.31	1.4567	1.4638	1.4690	37.00	37.05	37.31	1.4567	1.4587	1.4690
M42	4.5	–	38.10	38.20	38.46	1.5000	1.5039	1.5140	37.50	37.91	38.00	1.4764	1.4925	1.4961	37.50	37.62	38.00	1.4764	1.4811	1.4961
	–	3	39.00	39.47	39.50	1.5354	1.5539	1.5551	39.00	39.27	39.50	1.5354	1.5461	1.5551	39.00	39.08	39.50	1.5354	1.5386	1.5551
	–	2	40.00	40.31	41.00	1.5750	1.5870	1.6140	40.00	40.18	41.00	1.5750	1.5819	1.6140	40.00	40.05	41.00	1.5750	1.5768	1.6140

Tap Drill Size Charts • Thread Forming • UNC and UNF

tap size	pitch		65% thread						70% thread						75% thread					
			Metric			Inch			Metric			Inch			Metric			Inch		
	UNC	UNF	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill
#0	–	80	1.32	**1.38**	1.40	0.0520	**0.0545**	0.0550	1.32	**1.38**	1.40	0.0520	**0.0540**	0.0550	1.32	**1.36**	1.40	0.0520	**0.0536**	0.0550
#1	64	–	1.60	**1.68**	1.70	0.0630	**0.0661**	0.0669	1.60	**1.67**	1.70	0.0630	**0.0655**	0.0669	1.60	**1.65**	1.70	0.0630	**0.0650**	0.0669
	–	72	1.70	**1.70**	1.70	0.0669	**0.0669**	0.0669	1.60	**1.69**	1.70	0.0630	**0.0663**	0.0669	1.60	**1.67**	1.70	0.0630	**0.0659**	0.0669
#2	56	–	1.98	**1.98**	1.98	0.0781	**0.0781**	0.0781	1.90	**1.97**	1.98	0.0748	**0.0774**	0.0781	1.90	**1.95**	1.98	0.0748	**0.0769**	0.0781
	–	64	2.00	**2.01**	2.10	0.0787	**0.0791**	0.0827	2.00	**2.00**	2.00	0.0781	**0.0785**	0.0787	1.98	**1.98**	1.98	0.0748	**0.0780**	0.0781
#3	48	–	2.20	**2.28**	2.30	0.0866	**0.0898**	0.0906	2.20	**2.27**	2.30	0.0866	**0.0890**	0.0906	2.20	**2.25**	2.30	0.0866	**0.0884**	0.0906
	–	56	2.30	**2.31**	2.38	0.0906	**0.0911**	0.0938	2.30	**2.31**	2.38	0.0866	**0.0904**	0.0906	2.20	**2.28**	2.30	0.0866	**0.0899**	0.0906
#4	40	–	2.50	**2.57**	2.58	0.0984	**0.1010**	0.1015	2.50	**2.55**	2.58	0.0984	**0.1000**	0.1015	2.50	**2.52**	2.58	0.0984	**0.0993**	0.1015
	–	48	2.60	**2.61**	2.64	0.1024	**0.1028**	0.1040	2.60	**2.60**	2.60	0.1015	**0.1020**	0.1024	2.58	**2.58**	2.58	0.0984	**0.1014**	0.1015
#5	40	–	2.90	**2.90**	2.90	0.1130	**0.1140**	0.1142	2.87	**2.88**	2.90	0.1130	**0.1130**	0.1130	2.82	**2.85**	2.87	0.1110	**0.1123**	0.1130
	–	44	2.90	**2.92**	2.95	0.1142	**0.1150**	0.1160	2.90	**2.91**	2.95	0.1130	**0.1141**	0.1142	2.87	**2.88**	2.90	0.1130	**0.1134**	0.1142
#6	32	–	3.10	**3.16**	3.18	0.1220	**0.1243**	0.1250	3.10	**3.14**	3.18	0.1220	**0.1230**	0.1250	3.10	**3.10**	3.10	0.1220	**0.1221**	0.1250
	–	40	3.20	**3.23**	3.26	0.1260	**0.1270**	0.1285	3.20	**3.21**	3.26	0.1260	**0.1260**	0.1260	3.18	**3.18**	3.18	0.1250	**0.1253**	0.1260
#8	32	–	3.80	**3.82**	3.90	0.1496	**0.1503**	0.1535	3.80	**3.80**	3.80	0.1470	**0.1490**	0.1496	3.73	**3.76**	3.80	0.1470	**0.1481**	0.1496
	–	36	3.80	**3.86**	3.90	0.1496	**0.1518**	0.1535	3.80	**3.84**	3.90	0.1496	**0.1507**	0.1535	3.80	**3.80**	3.80	0.1496	**0.1498**	0.1535
#10	24	–	4.30	**4.36**	4.37	0.1693	**0.1716**	0.1719	4.30	**4.34**	4.37	0.1693	**0.1700**	0.1719	4.22	**4.29**	4.30	0.1660	**0.1688**	0.1693
	–	32	4.40	**4.48**	4.50	0.1732	**0.1762**	0.1772	4.40	**4.46**	4.50	0.1732	**0.1750**	0.1772	4.40	**4.42**	4.50	0.1732	**0.1741**	0.1772
#12	24	–	5.00	**5.02**	5.10	0.1969	**0.1976**	0.2008	5.00	**5.00**	5.00	0.1929	**0.1960**	0.1969	4.90	**4.95**	5.00	0.1929	**0.1948**	0.1969
	–	28	5.00	**5.09**	5.10	0.1969	**0.2002**	0.2008	5.00	**5.07**	5.10	0.1969	**0.1990**	0.2008	5.00	**5.02**	5.10	0.1969	**0.1978**	0.2008
1/4	20	–	5.70	**5.79**	5.80	0.2244	**0.2279**	0.2283	5.70	**5.76**	5.80	0.2244	**0.2260**	0.2283	5.70	**5.70**	5.70	0.2244	**0.2245**	0.2283
	–	28	5.95	**5.95**	5.95	0.2323	**0.2342**	0.2344	5.90	**5.94**	5.95	0.2323	**0.2329**	0.2344	5.80	**5.89**	5.90	0.2283	**0.2318**	0.2323
5/16	18	–	7.30	**7.31**	7.40	0.2874	**0.2879**	0.2913	7.30	**7.30**	7.30	0.2835	**0.2861**	0.2874	7.20	**7.22**	7.30	0.2835	**0.2842**	0.2874
	–	24	7.40	**7.47**	7.50	0.2913	**0.2941**	0.2953	7.40	**7.46**	7.50	0.2913	**0.2927**	0.2953	7.40	**7.40**	7.40	0.2874	**0.2912**	0.2913
3/8	16	–	8.80	**8.82**	8.90	0.3465	**0.3474**	0.3504	8.80	**8.80**	8.80	0.3438	**0.3452**	0.3465	8.70	**8.71**	8.73	0.3425	**0.3431**	0.3438
	–	24	9.00	**9.06**	9.10	0.3543	**0.3566**	0.3583	9.00	**9.06**	9.10	0.3543	**0.3552**	0.3583	8.90	**8.98**	9.00	0.3504	**0.3537**	0.3543
7/16	14	–	10.30	**10.31**	10.32	0.4055	**0.4059**	0.4063	10.20	**10.29**	10.30	0.4016	**0.4035**	0.4055	10.10	**10.19**	10.20	0.3976	**0.4011**	0.4016
	–	20	10.50	**10.55**	10.60	0.4134	**0.4154**	0.4173	10.50	**10.55**	10.60	0.4134	**0.4137**	0.4173	10.40	**10.46**	10.50	0.4094	**0.4120**	0.4134
1/2	13	–	11.80	**11.84**	11.90	0.4646	**0.4660**	0.4685	11.80	**11.82**	11.90	0.4606	**0.4634**	0.4646	11.70	**11.70**	11.70	0.4606	**0.4608**	0.4646
	–	20	12.10	**12.14**	12.20	0.4764	**0.4779**	0.4803	12.10	**12.14**	12.20	0.4724	**0.4762**	0.4764	12.00	**12.05**	12.10	0.4724	**0.4745**	0.4764
9/16	12	–	13.10	**13.35**	13.50	0.5157	**0.5257**	0.5315	13.10	**13.33**	13.50	0.5157	**0.5229**	0.5315	13.10	**13.21**	13.50	0.5157	**0.5200**	0.5315
	–	18	13.50	**13.66**	13.80	0.5315	**0.5379**	0.5433	13.50	**13.67**	13.80	0.5315	**0.5361**	0.5433	13.50	**13.57**	13.80	0.5315	**0.5342**	0.5433
5/8	11	–	14.50	**14.85**	15.00	0.5709	**0.5848**	0.5906	14.50	**14.83**	15.00	0.5709	**0.5817**	0.5906	14.50	**14.70**	15.00	0.5709	**0.5787**	0.5906
	–	18	15.10	**15.25**	15.50	0.5945	**0.6004**	0.6102	15.10	**15.26**	15.50	0.5945	**0.5986**	0.6102	15.10	**15.16**	15.50	0.5945	**0.5967**	0.6102
3/4	10	–	17.50	**17.93**	18.00	0.6890	**0.7058**	0.7087	17.50	**17.91**	18.00	0.6890	**0.7024**	0.7087	17.50	**17.75**	18.00	0.6890	**0.6990**	0.7087
	–	16	18.00	**18.35**	18.50	0.7087	**0.7224**	0.7283	18.00	**18.37**	18.50	0.7087	**0.7202**	0.7283	18.00	**18.24**	18.50	0.7087	**0.7181**	0.7283
7/8	9	–	20.50	**20.98**	21.00	0.8071	**0.8259**	0.8268	20.50	**20.96**	21.00	0.8071	**0.8221**	0.8268	20.50	**20.78**	21.00	0.8071	**0.8183**	0.8268
	–	14	21.33	**21.42**	21.43	0.8398	**0.8434**	0.8440	21.43	**21.45**	21.50	0.8398	**0.8410**	0.8440	21.15	**21.30**	21.33	0.8327	**0.8386**	0.8398
1	8	–	24.00	**24.00**	24.00	0.9380	**0.9448**	0.9449	23.81	**23.98**	24.00	0.9380	**0.9405**	0.9449	23.50	**23.78**	23.81	0.9252	**0.9363**	0.9375
	–	12	24.30	**24.47**	24.50	0.9567	**0.9632**	0.9646	24.30	**24.49**	24.50	0.9567	**0.9603**	0.9646	24.30	**24.32**	24.50	0.9567	**0.9575**	0.9646

Tap Drill Size Charts • Thread Forming • M and MF

tap size	pitch		65% thread						70% thread						75% thread					
			Metric			Inch			Metric			Inch			Metric			Inch		
	M	MF	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill	smallest drill	theoretical	largest drill
M1.6	0.35	–	1.40	1.45	1.50	0.0551	0.0571	0.0591	1.40	1.43	1.50	0.0551	0.0563	0.0591	1.40	1.42	1.50	0.0551	0.0559	0.0591
M1.7	0.35	–	1.50	1.58	1.60	0.0591	0.0623	0.0630	1.50	1.57	1.60	0.0591	0.0620	0.0630	1.50	1.56	1.60	0.0591	0.0617	0.0630
M1.8	0.35	–	1.60	1.65	1.70	0.0630	0.0650	0.0669	1.60	1.63	1.70	0.0630	0.0642	0.0669	1.60	1.62	1.70	0.0630	0.0638	0.0669
M2	0.4	–	1.80	1.82	1.90	0.0709	0.0717	0.0748	1.80	1.81	1.90	0.0709	0.0713	0.0748	1.80	1.80	1.80	0.0709	0.0709	0.0709
M2.2	0.45	–	2.00	2.00	2.00	0.0787	0.0787	0.0787	1.98	1.99	2.00	0.0781	0.0783	0.0787	1.90	1.97	1.98	0.0748	0.0776	0.0781
M2.5	0.45	–	2.30	2.30	2.30	0.0906	0.0906	0.0906	2.20	2.29	2.30	0.0866	0.0902	0.0906	2.20	2.27	2.30	0.0866	0.0894	0.0906
M2.6	0.45	–	2.40	2.43	2.44	0.0945	0.0957	0.0960	2.40	2.42	2.44	0.0945	0.0953	0.0960	2.40	2.41	2.44	0.0945	0.0949	0.0960
M3	0.5	–	2.78	2.78	2.80	0.1094	0.1094	0.1094	2.71	2.76	2.78	0.1065	0.1087	0.1094	2.71	2.75	2.78	0.1065	0.1083	0.1094
	–	0.35	2.87	2.88	2.90	0.1130	0.1134	0.1142	2.87	2.87	2.87	0.1130	0.1130	0.1130	2.82	2.86	2.87	0.1110	0.1126	0.1130
M3.5	0.6	–	3.20	3.23	3.26	0.1260	0.1272	0.1285	3.20	3.21	3.26	0.1260	0.1264	0.1285	3.18	3.19	3.20	0.1250	0.1256	0.1260
M4	0.7	–	3.66	3.69	3.70	0.1440	0.1453	0.1457	3.66	3.67	3.70	0.1440	0.1445	0.1457	3.60	3.64	3.66	0.1417	0.1433	0.1440
	–	0.5	3.73	3.78	3.80	0.1470	0.1488	0.1496	3.73	3.76	3.80	0.1470	0.1480	0.1496	3.73	3.75	3.80	0.1470	0.1476	0.1496
M4.5	0.75	–	4.10	4.17	4.20	0.1614	0.1642	0.1654	4.10	4.14	4.20	0.1614	0.1630	0.1654	4.10	4.12	4.20	0.1614	0.1622	0.1654
M5	0.8	–	4.62	4.65	4.70	0.1820	0.1831	0.1850	4.60	4.62	4.62	0.1811	0.1819	0.1820	4.50	4.59	4.60	0.1772	0.1807	0.1811
	–	0.5	4.76	4.78	4.80	0.1875	0.1882	0.1890	4.70	4.76	4.76	0.1850	0.1874	0.1875	4.70	4.75	4.76	0.1850	0.1870	0.1875
M6	1	–	5.56	5.56	5.60	0.2188	0.2189	0.2205	5.50	5.52	5.56	0.2165	0.2173	0.2188	5.41	5.49	5.50	0.2130	0.2161	0.2165
	–	0.75	5.62	5.67	5.70	0.2211	0.2232	0.2244	5.62	5.64	5.70	0.2211	0.2220	0.2244	5.62	5.62	5.70	0.2211	0.2213	0.2244
M7	1	–	6.53	6.56	6.60	0.2570	0.2583	0.2598	6.50	6.52	6.53	0.2559	0.2567	0.2570	6.40	6.49	6.50	0.2520	0.2555	0.2559
M8	1.25	–	7.40	7.45	7.50	0.2913	0.2933	0.2953	7.40	7.41	7.50	0.2913	0.2917	0.2953	7.30	7.36	7.40	0.2874	0.2898	0.2913
	–	1	7.54	7.56	7.60	0.2969	0.2976	0.2992	7.50	7.52	7.54	0.2953	0.2961	0.2969	7.40	7.49	7.50	0.2913	0.2949	0.2953
	–	0.75	7.60	7.67	7.70	0.2992	0.3020	0.3031	7.60	7.64	7.70	0.2992	0.3008	0.3031	7.60	7.62	7.70	0.2992	0.3000	0.3031
M10	1.5	–	9.30	9.34	9.35	0.3661	0.3677	0.3680	9.20	9.29	9.30	0.3622	0.3657	0.3661	9.20	9.24	9.30	0.3622	0.3638	0.3661
	–	1.25	9.40	9.45	9.50	0.3701	0.3720	0.3740	9.40	9.41	9.50	0.3701	0.3705	0.3740	9.35	9.36	9.40	0.3680	0.3685	0.3701
	–	1	9.53	9.56	9.60	0.3750	0.3764	0.3780	9.50	9.52	9.53	0.3740	0.3748	0.3750	9.40	9.49	9.50	0.3701	0.3736	0.3740
	–	0.75	9.60	9.67	9.70	0.3780	0.3807	0.3819	9.60	9.64	9.70	0.3780	0.3795	0.3819	9.60	9.62	9.70	0.3780	0.3787	0.3819
M12	1.75	–	11.20	11.23	11.30	0.4409	0.4421	0.4449	11.15	11.17	11.20	0.4375	0.4398	0.4409	11.10	11.11	11.15	0.4370	0.4374	0.4375
	–	1.5	11.30	11.34	11.40	0.4449	0.4465	0.4488	11.20	11.29	11.30	0.4449	0.4484	0.4488	11.20	11.24	11.30	0.4409	0.4425	0.4449
	–	1.25	11.40	11.45	11.50	0.4488	0.4508	0.4528	11.40	11.41	11.50	0.4488	0.4492	0.4528	11.30	11.36	11.40	0.4449	0.4472	0.4488
	–	1	11.51	11.56	11.60	0.4531	0.4551	0.4567	11.51	11.52	11.60	0.4531	0.4535	0.4567	11.40	11.49	11.50	0.4488	0.4524	0.4528
M14	2	–	13.10	13.12	13.50	0.5157	0.5165	0.5315	13.00	13.05	13.10	0.5118	0.5138	0.5157	12.80	12.98	13.00	0.5039	0.5110	0.5118
	–	1.5	13.10	13.34	13.50	0.5157	0.5252	0.5315	13.10	13.29	13.50	0.5157	0.5232	0.5315	13.10	13.24	13.50	0.5157	0.5213	0.5315
M16	2	–	15.10	15.12	15.50	0.5945	0.5953	0.6102	15.00	15.05	15.10	0.5906	0.5925	0.5945	14.50	14.98	15.00	0.5709	0.5898	0.5906
	–	1.5	15.10	15.34	15.50	0.5945	0.6039	0.6102	15.10	15.29	15.50	0.5945	0.6020	0.6102	15.10	15.24	15.50	0.5945	0.6000	0.6102
M18	2.5	–	16.50	16.90	17.00	0.6496	0.6654	0.6693	16.50	16.81	17.00	0.6496	0.6618	0.6693	16.50	16.73	17.00	0.6496	0.6587	0.6693
	–	1.5	17.00	17.34	17.50	0.6693	0.6827	0.6890	17.00	17.29	17.50	0.6693	0.6807	0.6890	17.00	17.24	17.50	0.6693	0.6787	0.6890
M20	2.5	–	18.50	18.90	19.00	0.7283	0.7441	0.7480	18.50	18.81	19.00	0.7283	0.7406	0.7480	18.50	18.73	19.00	0.7283	0.7374	0.7480
	–	1.5	19.00	19.34	19.50	0.7480	0.7614	0.7677	19.00	19.29	19.50	0.7480	0.7594	0.7677	19.00	19.24	19.50	0.7480	0.7575	0.7677
	–	1	19.50	19.56	20.00	0.7677	0.7701	0.7874	19.50	19.52	20.00	0.7677	0.7685	0.7874	19.00	19.49	19.50	0.7480	0.7673	0.7677
M22	2.5	–	20.50	20.90	21.00	0.8071	0.8228	0.8268	20.50	20.81	21.00	0.8071	0.8193	0.8268	20.50	20.73	21.00	0.8071	0.8161	0.8268
	–	2	21.00	21.12	21.15	0.8268	0.8315	0.8327	21.00	21.05	21.15	0.8268	0.8287	0.8327	20.50	20.98	21.00	0.8071	0.8260	0.8268
	–	1.5	21.33	21.34	21.43	0.8398	0.8402	0.8440	21.15	21.29	21.33	0.8327	0.8382	0.8398	21.15	21.24	21.33	0.8327	0.8362	0.8398
M24	3	–	22.50	22.67	22.77	0.8858	0.8925	0.8965	22.50	22.57	22.77	0.8858	0.8886	0.8965	22.44	22.47	22.50	0.8840	0.8846	0.8858
	–	2	23.10	23.12	23.30	0.9094	0.9102	0.9173	23.00	23.05	23.10	0.9055	0.9075	0.9094	22.77	22.98	23.00	0.8965	0.9047	0.9055
	–	1.5	23.30	23.34	23.42	0.9173	0.9189	0.9220	23.10	23.29	23.30	0.9094	0.9169	0.9173	23.10	23.24	23.30	0.9094	0.9150	0.9173

Tap Drill Size Charts • Pipe Taps

pipe tap size	NPT and NPTF without reamer	NPT and NPTF with reamer	NPSM	NPSC	NPSF
1/16-27	0.2420	0.2344	–	0.2500	0.2460
1/8-27	0.3320	0.3281	0.3580	0.3320	0.3390
1/4-18	0.4375	0.4219	0.4688	0.4375	0.4375
3/8-18	0.5625	0.5625	0.6030	0.5781	0.5781
1/2-14	0.7031	0.6875	0.7480	0.7087	0.7087
3/4-14	0.9063	0.8906	0.9531	0.9219	0.9219
1-11 1/2	1.1406	1.1250	1.2031	1.1563	1.1563
1 1/4-11 1/2	1.4844	1.4688	1.5460	1.5000	–
1 1/2-11 1/2	1.7188	1.7031	1.7813	1.7344	–
2-11 1/2	2.1875	2.1719	2.2500	2.2031	–

Tap Recommendations for Classes 2B and 3B

Unified Inch Screw Threads

thread size/pitch	recommended tap limits[1] class 2B	recommended tap limits[1] class 3B	internal thread pitch diameter limits min all classes (Basic)	internal thread pitch diameter limits max class 2B	internal thread pitch diameter limits max class 3B
0 - 80	H2	H2	0.0519	0.0542	0.0536
1 - 64	H2	H2	0.0629	0.0655	0.0648
1 - 72	H2	H2	0.0640	0.0665	0.0659
2 - 56	H2	H2	0.0744	0.0772	0.0765
2 - 64	H2	H2	0.0759	0.0786	0.0779
3 - 48	H3	H2	0.0855	0.0885	0.0877
3 - 56	H2	H2	0.0874	0.0902	0.0895
4 - 40	H3	H2	0.0958	0.0991	0.0982
4 - 48	H3	H2	0.0985	0.1016	0.1008
5 - 40	H3	H2	0.1088	0.1121	0.1113
5 - 44	H3	H2	0.1102	0.1134	0.1126
6 - 32	H3	H2	0.1177	0.1214	0.1204
6 - 40	H3	H2	0.1218	0.1252	0.1243
8 - 32	H3	H3	0.1437	0.1475	0.1465
8 - 36	H3	H3	0.1460	0.1496	0.1487
10 - 24	H3	H3	0.1629	0.1672	0.1661
10 - 32	H3	H3	0.1697	0.1736	0.1726
12 - 24	H3	H3	0.1889	0.1933	0.1922
12 - 28	H3	H3	0.1928	0.1970	0.1959
1/4 - 20	H5	H3	0.2175	0.2224	0.2211
1/4 - 28	H4	H3	0.2268	0.2311	0.2300
5/16 - 18	H5	H3	0.2764	0.2817	0.2803
5/16 - 24	H4	H3	0.2854	0.2902	0.2890
3/8 - 16	H5	H3	0.3344	0.3401	0.3387
3/8 - 24	H4	H3	0.3479	0.3528	0.3516
7/16 - 14	H5	H3	0.3911	0.3972	0.3957
7/16 - 20	H5	H3	0.4050	0.4104	0.4091
1/2 - 13	H5	H4	0.4500	0.4565	0.4548
1/2 - 20	H5	H3	0.4675	0.4731	0.4717
9/16 - 12	H5	H4	0.5084	0.5152	0.5135
9/16 - 18	H5	H3	0.5264	0.5323	0.5308
5/8 - 11	H5	H4	0.5660	0.5732	0.5714
5/8 - 18	H5	H3	0.5889	0.5949	0.5934
3/4 - 10	H5	H4	0.6850	0.6927	0.6907

[1]Tap H limit selected for 3B will also produce thread to 2B.

NOTE: The above recommended taps normally produce the class of thread indicated in average materials when used with reasonable care. However, if the specified tap does not provide a satisfactory gage fit, choose an alternate tap limit.

Tap Recommendations for Classes 2B and 3B

Unified Inch Screw Threads

thread size/pitch	recommended tap limits[1] class 2B	class 3B	internal thread pitch diameter limits min all classes (Basic)	max class 2B	max class 3B
3/4 - 16	H5	H4	0.7094	0.7159	0.7143
7/8 - 9	H6	H4	0.8028	0.8110	0.8089
7/8 - 14	H6	H4	0.8286	0.8356	0.8339
1” - 8	H6	H5	0.9188	0.9276	0.9254
1” - 12	H6	H4	0.9459	0.9535	0.9516
1-1/8 - 7	H8	H6	1.0322	1.0416	1.0393
1-1/8 - 8	H8	H6	1.0438	1.0528	1.0505
1-1/8 - 12	H6	H5	1.0709	1.0787	1.0768
1-1/4 - 7	H8	H6	1.1572	1.1668	1.1644
1-1/4 - 8	H8	H6	1.1688	1.1780	1.1757
1-1/4 - 12	H6	H5	1.1959	1.2039	1.2019
1-3/8 - 6	H8	H6	1.2667	1.2771	1.2745
1-3/8 - 8	H8	H6	1.2938	1.3031	1.3008
1-3/8 - 12	H6	H5	1.3209	1.3291	1.3270
1-1/2 - 6	H8	H6	1.3917	1.4022	1.3996
1-1/2 - 8	H8	H6	1.4188	1.4283	1.4259
1-1/2 - 12	H6	H5	1.4459	1.4542	1.4522
1-3/4 - 5	H8	H7	1.6201	1.6317	1.6288
2 - 4 1/2	H8	H7	1.8557	1.8681	1.8650

[1]Tap H limit selected for 3B will also produce thread to 2B.

Tap Recommendations for Class 6H Metric Screw Threads

thread size: nominal diameter (mm)	thread size: pitch (mm)	recommended tap: limit number	internal thread product limits — class 6H: pitch diameter (mm) min	pitch diameter (mm) max	pitch diameter (in) min	pitch diameter (in) max
1,6	0,35	D3	1,373	1,458	.05406	.05740
2	0,4	D3	1,740	1,830	.06850	.07205
2,5	0,45	D3	2,208	2,303	.08693	.09067
3	0,5	D3	2,675	2,775	.10531	.10925
3,5	0,6	D4	3,110	3,222	.12244	.12685
4	0,7	D4	3,545	3,663	.13957	.14421
4,5	0,75	D4	4,013	4,131	.15789	.16264
5	0,8	D4	4,480	4,605	.17638	.18130
6	1	D5	5,350	5,500	.21063	.21654
7	1	D5	6,350	6,500	.25000	.25591
8	1,25	D5	7,188	7,348	.28299	.28929
10	1,5	D6	9,026	9,206	.35535	.36244
12	1,75	D6	10,863	11,063	.42768	.43555
14	2	D7	12,701	12,913	.50004	.50839
16	2	D7	14,701	14,913	.57878	.58713
20	2,5	D7	18,376	18,600	.72346	.73228
24	3	D8	22,051	22,316	.86815	.87858
30	3,5	D9	27,727	28,007	1.09161	1.10264
36	4	D9	33,402	33,702	1.31504	1.32685

Decimal Equivalents

drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)
0,30mm	.0118	54	.0550	3,10mm	.1220	5,50mm	.2165	8,50mm	.3346	9/16	.5625
0,32mm	.0126	1,40mm	.0551	1/18	.1250	7/32	.2188	8,60mm	.3386	14,50mm	.5709
80	.0135	1,45mm	.0571	3,20mm	.1260	5,60mm	.2205	R	.3390	37/64	.5781
0,35mm	.0138	1,50mm	.0591	30	.1285	2	.2210	8,70mm	.3425	14,75mm	.5807
79	.0145	53	.0595	3,30mm	.1299	5,70mm	.2244	11/32	.3438	15,00mm	.5906
0,38mm	.0150	1,55mm	.0610	3,40mm	.1339	1	.2280	8,80mm	.3465	19/32	.5938
1/64	.0156	1/16	.0625	29	.1360	5,80mm	.2283	S	.3480	15,25mm	.6004
0,40mm	.0157	1,60mm	.0630	3,50mm	.1378	5,90mm	.2323	8,90mm	.3504	39/64	.6094
78	.0160	52	.0635	28	.1405	A	.2340	9,00mm	.3543	15,50mm	.6102
0,42mm	.0165	1,65mm	.0650	9/64	.1406	15/64	.2344	T	.3580	15,75mm	.6201
0,45mm	.0177	1,70mm	.0669	3,60mm	.1417	6,00mm	.2362	9,10mm	.3583	5/8	.6250
77	.0180	51	.0670	27	.1440	B	.2380	23/64	.3594	16,00mm	.6299
0,48mm	.0189	1,75mm	.0689	3,70mm	.1457	6,10mm	.2402	9,20mm	.3622	16,25mm	.6398
0,50mm	.0197	50	.0700	26	.1470	C	.2420	9,30mm	.3661	41/64	.6406
76	.0200	1,80mm	.0709	25	.1495	6,20mm	.2441	U	.3680	16,50mm	.6496
75	.0210	1,85mm	.0728	3,80mm	.1496	D	.2460	9,40mm	.3701	21/32	.6562
0,55mm	.0217	49	.0730	24	.1520	6,30mm	.2480	9,50mm	.3740	16,75mm	.6594
74	.0225	1,90mm	.0748	3,90mm	.1535	1/4, E	.2500	3/8	.3750	17,00mm	.6693
0,60mm	.0236	48	.0760	23	.1540	6,40mm	.2520	V	.3770	43/64	.6719
73	.0240	1,95mm	.0768	5/32	.1562	6,50mm	.2559	9,60mm	.3780	17,25mm	.6791
0,62mm	.0244	5/64	.0781	22	.1570	F	.2570	9,70mm	.3819	11/16	.6875
72	.0250	47	.0785	4,00mm	.1575	6,60mm	.2598	9,80mm	.3858	17,50mm	.6890
0,65mm	.0256	2,00mm	.0787	21	.1590	G	.2610	W	.3860	45/64	.7031
71	.0260	2,05mm	.0807	20	.1610	6,70mm	.2638	9,90mm	.3898	18,00mm	.7087
0,70mm	.0276	46	.0810	4,10mm	.1614	17/64	.2656	25/64	.3906	23/32	.7188
70	.0280	45	.0820	4,20mm	.1654	H	.2660	10,00mm	.3937	18,50mm	.7283
69	.0292	2,10mm	.0827	19	.1660	6,80mm	.2677	X	.3970	47/64	.7344
0,75mm	.0295	2,15mm	.0846	4,30mm	.1693	6,90mm	.2717	10,20mm	.4016	19,00mm	.7480
68	.0310	44	.0860	18	.1695	I	.2720	Y	.4040	3/4	.7500
1/32	.0312	2,20mm	.0866	11/64	.1719	7,00mm	.2756	13/32	.4062	49/64	.7656
0,80mm	.0315	2,25mm	.0886	17	.1730	J	.2770	Z	.4130	19,50mm	.7677
67	.0320	43	.0890	4,40mm	.1732	7,10mm	.2795	10,50mm	.4134	25/32	.7812
66	.0330	2,30mm	.0906	16	.1770	K	.2810	27/64	.4219	20,00mm	.7874
0,85mm	.0335	2,35mm	.0925	4,50mm	.1772	9/32	.2812	10,80mm	.4252	51/64	.7969
65	.0350	42	.0935	15	.1800	7,20mm	.2835	11,00mm	.4331	20,50mm	.8071
0,90mm	.0354	3/32	.0938	4,60mm	.1811	7,30mm	.2874	7/16	.4375	13/16	.8125
64	.0360	2,40mm	.0945	14	.1820	L	.2900	11,20mm	.4409	21,00mm	.8268
63	.0370	41	.0960	4,70mm, 13	.1850	7,40mm	.2913	11,50mm	.4528	53/64	.8281
0,95mm	.0374	2,45mm	.0965	3/16	.1875	M	.2950	29/64	.4531	27/32	.8438
62	.0380	40	.0980	4,80mm, 12	.1890	7,50mm	.2953	11,80mm	.4646	21,50mm	.8465
61	.0390	2,50mm	.0984	11	.1910	19/64	.2969	15/32	.4688	55/64	.8594
1,00mm	.0394	39	.0995	4,90mm	.1929	7,60mm	.2992	12,00mm	.4724	22,00mm	.8661
60	.0400	38	.1015	10	.1935	N	.3020	12,20mm	.4803	7/8	.8750
59	.0410	2,60mm	.1024	9	.1960	7,70mm	.3031	31/64	.4844	22,50mm	.8858
1,05mm	.0413	37	.1040	5,00mm	.1969	7,80mm	.3071	12,50mm	.4921	57/64	.8906
58	.0420	2,70mm	.1063	8	.1990	7,90mm	.3110	1/2	.5000	23,00mm	.9055
57	.0430	36	.1065	5,10mm	.2008	5/16	.3125	12,80mm	.5039	29/32	.9062
1,10mm	.0433	7/64	.1094	7	.2010	8,00mm	.3150	13,00mm	.5118	59/64	.9219
1,15mm	.0453	35	.1100	13/64	.2031	O	.3160	33/64	.5156	23,50mm	.9252
56	.0465	2,80mm	.1102	6	.2040	8,10mm	.3189	13,20mm	.5197	15/16	.9375
3/64	.0469	34	.1110	5,20mm	.2047	8,20mm	.3228	17/32	.5312	24,00mm	.9449
1,20mm	.0472	33	.1130	5	.2055	P	.3230	13,50mm	.5315	61/64	.9531
1,25mm	.0492	2,90mm	.1142	5,30mm	.2087	8,30mm	.3268	13,80mm	.5433	24,50mm	.9646
1,30mm	.0512	32	.1160	4	.2090	21/64	.3281	35/64	.5469	31/32	.9688
55	.0520	3,00mm	.1181	5,40mm	.2126	8,40mm	.3307	14,00mm	.5512	25,00mm	.9843
1,35mm	.0531	31	.1200	3	.2130	Q	.3320	14,25mm	.5610	63/64	.9844
–	–	–	–	–	–	–	–	–	–	1"	1.0000

Metric Fractional Wire gage Letter size

widia.com

WIDIA™

Turning

External Turning and Internal Boring E4–E297

High-Performance Inserts • WIDIA Victory E4–E117

High-Performance Inserts for Machining Aluminum E118–E125

Advanced Materials Inserts • CBN, Ceramics, and PCD E126–E177

Toolholders for External Turning E178–E212

Toolholders for Internal Boring E214–E237

Cartridges for Internal Boring E238–E245

Railway Wheel Reprofiling / Wheelset Turning / Bar Peeling E246–E255

Small Hole Boring E256–E297

Grooving and Cut-Off E298–E429

WGC E298–E338

WMT E340–E373

TopGroove E374–E425

LG Grooving E426–E429

Threading E430–E515

TopThread E430–E461

Laydown E462–E491

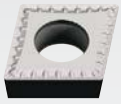
Technical Information E492–E515

The Victory ISO turning portfolio offers a comprehensive range of ISO Turning Inserts with advanced substrates and coating technologies for high productivity, long tool life, and reliability in rough to finish-turning applications. Inserts in this portfolio can be applied across a wide range of applications with effective chip control and smooth surface finish at a strong cost performance ratio.

NEGATIVE INSERTS

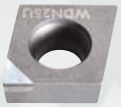
- Negative-style inserts are first choice for general machining of materials in medium to large lathes
- Negative-style insets are available in flat-top and chip-control chip breakers in both molded and ground peripheries suitable for all workpiece materials

POSITIVE INSERTS



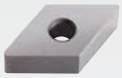
- Screw-on inserts are the first choice for I.D. turning of all materials and O.D. turning on small to medium lathes suitable for all workpiece materials

PcBN AND PCD INSERTS



- PcBN can be used for machining steels with a hardness higher than 48 HRC
- PcBN inserts can also be used for productivity improvements in machining cast irons and high-temp alloys
- PCD inserts are used to machine non-ferrous materials

CERAMIC INSERTS



- Ceramic inserts are a great choice for productive machining of high-temp alloys
- Negative rake inserts are also recommended for the machining of hardened materials and cast irons available in flat-top chip breakers with molded and ground peripheries

WIDIA VICTORY TURNING INSERTS

VERSATILITY

Specialty engineering substrate with wear-resistant, multi-layer coating makes it suitable for wide range of applications.

STABILITY

Pre- and post-coat treatment along with post-coat grinding improves edge toughness, provides secure seating leading to consistent performance.

PRODUCTIVITY

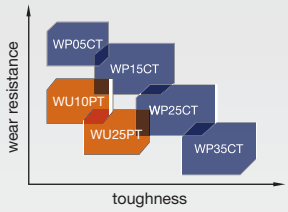
Multi-layer CVD coating with alpha-alumina layer provides higher productivity and tool life with reliability at elevated speeds and feeds.

SIMPLICITY

Outer layer bronze colored for easy wear identification. Easy to select and apply grades and chip breakers for roughing to finishing applications in variety of workpiece materials.

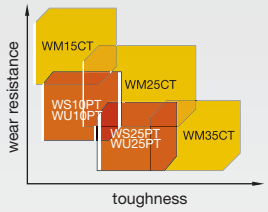
STEEL, STAINLESS STEEL, CAST IRON, AND HIGH-TEMP ALLOY INSERTS

VICTORY™ TURNING



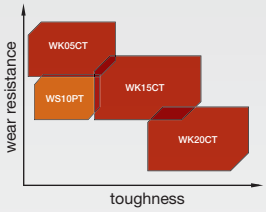
WP GRADES FOR STEEL

- Four grades for use in roughing to finishing operations
- Increase cutting speed and/or feed rate to gain productivity



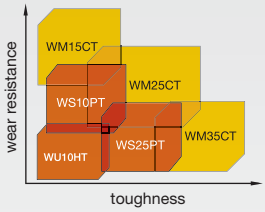
WM GRADES FOR STAINLESS STEEL

- Three grades in suitable chip breakers for use in roughing to finishing operations
- Very good balance of wear resistance and toughness for long, predictable tool life



WK GRADES FOR CAST IRON

- Three grades to cover all of your cast iron turning operations
- Increase cutting speed and/or feed rate by up to 30% over similar competitive grades
- WK15CT is the first choice for cast iron turning



WS GRADES FOR HIGH-TEMP ALLOYS

- Two grades for use in roughing to finishing operations
- Very good wear resistance for longer tool life

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

ENERGY

AEROSPACE

MEDICAL

Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

C — Insert Shape

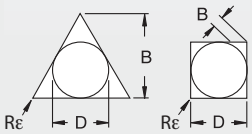
H	Hexagon 120°
O	Octagon 135°
P	Pentagon 108°
R	Round —
S	Square 90°
T	Triangular 60°
C D E M V	Rhomboid 80° 55° 75° 86° 35°
W	Trigon 80° with enlarged corner angles
L	Rectangular 90°
A B N/K	Parallelogram 85° 82° 55°

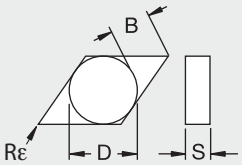
N — Insert Clearance Angle

A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Indicated for other clearance angles requiring descriptions.

M — Tolerance Class

Tolerances apply prior to edge prep and coating





D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	See tables on next page		±0,013
U	See tables on next page		±0,013

G — Insert Features

N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X V	Special Design

12 — Size

Code for mm cutting edge length "L10"

"D" mm	C	D	R	S	T	V	W
3,97	S4	04	03	03	06	—	—
4,76	04	05	04	04	08	08	S3
5,56	05	06	05	05	09	09	03
6,00	—	—	06	—	—	—	—
6,35	06	07	06	06	11	11	04
7,94	08	09	07	07	13	13	05
8,00	—	—	08	—	—	—	—
9,52	09	11	09	09	16	16	06
10,00	—	—	10	—	—	—	—
11,11	11	13	11	11	19	19	07
12,00	—	—	12	—	—	—	—
12,70	12	15	12	12	22	22	08
14,29	14	17	14	14	24	24	09
15,88	16	19	15	15	27	27	10
16,00	—	—	16	—	—	—	—
17,46	17	21	17	17	30	30	11
19,05	19	23	19	19	33	33	13
20,00	—	—	20	—	—	—	—
22,22	22	27	22	22	38	38	15
25,00	—	—	25	—	—	—	—
25,40	25	31	25	25	44	44	17
31,75	32	38	31	31	54	54	21
32,00	—	—	32	—	—	—	—

Catalog Numbering System

(continued)

04

Thickness
S

symbol mm	thickness mm
—	0,79
T0	1,00
01	1,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
9	9,52
11	11,11
12	12,70

08

Corner
Radius "Rε"

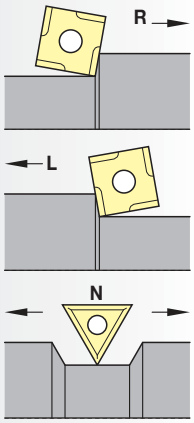
symbol mm	corner radius mm
X0	0,04
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	round insert
M0	round insert
—	round insert

Hand of Insert
(optional)

R = Right hand

L = Left hand

N = Neutral



Cutting Edge
(optional)

F Sharp

E Rounded

T Chamfered

S Chamfered and Rounded

K Double-Chamfered

P Double-Chamfered and Rounded

UR

Chipbreaker
(optional)

13	=	Railroad Light
CT	=	Copy Turning
FF	=	Fine Finishing
FP	=	Finish Positive
FW	=	Finish Wiper
ML	=	Medium Light
MR	=	Medium Roughing
MW	=	Medium Wiper
RH	=	Roughing Heavy
T	=	Negative Land
UF	=	Universal Finishing
UM	=	Universal Medium
UR	=	Universal Roughing
.NMP	=	Sharp Medium
MP	=	Medium Positive
FS	=	Finishing High-Temp(S)
MS	=	Medium High-Temp(S)
MU	=	Medium Universal
SR	=	Super Roughing
65	=	Heavy Roughing
8	=	Heavy Roughing
.NGP	=	Sharp Medium

"D" mm	± Tolerance on "D" Class M Tolerance Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Class U Tolerance Shapes S, T, & C mm
3,97	0,05	–	–	–
4,76	0,05	–	–	0,08
5,56	0,05	0,05	0,05	0,08
6,35	0,05	0,05	0,05	0,08
7,94	0,05	0,05	0,05	0,08
9,52	0,05	0,05	0,05	0,08
11,11	0,08	0,08	0,08	0,13
12,70	0,08	0,08	0,08	0,13
14,29	0,08	0,08	0,08	0,13
15,88	0,10	0,10	0,10	0,18
17,46	0,10	0,10	0,10	0,18
19,05	0,10	0,10	0,10	0,18
22,22	0,13	–	–	0,25
25,40	0,13	–	–	0,25
31,75	0,15	–	–	0,25

"D" mm	± Tolerance on "B" Class M Tolerance Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Class U Tolerance Shapes S, T, & C mm
3,97	0,08	–	–	–
4,76	0,08	–	–	0,13
5,56	0,08	0,11	–	0,13
6,35	0,08	0,11	–	0,13
7,94	0,08	0,11	–	0,13
9,52	0,08	0,11	0,18	0,13
11,11	0,13	0,15	–	–
12,70	0,13	0,15	0,25	0,20
14,29	0,13	0,15	–	–
15,88	0,15	0,18	–	0,27
17,46	0,15	0,18	–	0,27
19,05	0,15	0,18	–	0,27
22,22	0,15	–	–	0,38
25,40	0,18	–	–	0,38
31,75	0,20	–	–	0,38

Victory Grade Naming System

ISO turning products featured in the All-Star program provide solutions for applications in steel, stainless steel, cast iron, and high-temp alloys. WIDIA™ Victory turning grades and geometries deliver higher productivity through reduced cycle time, long tool life, and improved chip control.

W	P	15	C	T
Brand	Workpiece Material	Application Range	Insert Material	Application
W = WIDIA	**P** = Steel **M** = Stainless Steel **K** = Cast Iron **N** = Non Ferrous **S** = High-Temp Alloys **H** = Hardened Materials **U** = Universal Application	**05** = Fine Finishing **10** = Finishing **15** = Medium to Roughing **20** = Medium to Roughing **25** = Roughing **30** = Roughing **35** = Heavy Roughing **40** = Heavy Roughing **45** = Heavy Roughing **50** = Heavy Roughing	**H** = Carbide (Uncoated) **C** = Carbide + CVD **P** = Carbide + PVD **T** = Cermet **Y** = Ceramics **D** = Diamond **B** = PCBN **S** = HSS **E** = HSS-E **M** = HSS-E-PM	**T** = Turning **M** = Milling **H** = Holemaking **D** = Solid Drills **E** = Solid End Mills **G** = Taps **R** = Reamers **V** = Thread Mills

Cutting Speed Recommendation • P • Metric

Low-Carbon (<0.3% C) and Free-Machining Steel

speed — m/min

material group	grade	135	180	225	275	320	360	410	455	495	Starting Conditions m/min
P0/P1	WP05CT										435
	WP15CT										395
	WP25CT										275
	WP35CT										210
	WS10PT/WU10PT										280

Medium- and High-Carbon Steels (>0.3% C)

speed — m/min

material group	grade	135	180	225	275	320	360	410	455	495	Starting Conditions m/min
P2	WP05CT										240
	WP15CT										265
	WP25CT										195
	WP35CT										150
	WS10PT/WU10PT										200

Alloy Steels and Tool Steels (≤330 HB) (≤35 HRC)

speed — m/min

material group	grade	135	180	225	275	320	360	410	455	495	Starting Conditions m/min
P3	WP05CT										205
	WP15CT										190
	WP25CT										155
	WP35CT										120
	WS10PT/WU10PT										155

Alloy Steels and Tool Steels (340–450 HB) (36–48 HRC)

speed — m/min

material group	grade	60	90	120	150	180	210	240	270	300	Starting Conditions m/min
P4	WP05CT										160
	WP15CT										145
	WP25CT										105
	WP35CT										95
	WS10PT/WU10PT										110

Ferritic, Martensitic, and PH Stainless Steels (≤330 HB) (≤35 HRC)

speed — m/min

material group	grade	120	150	180	210	240	270	300	330	360	Starting Conditions m/min
P5	WP05CT										240
	WP15CT										215
	WP25CT										195
	WP35CT										135
	WS10PT/WU10PT										200

Ferritic, Martensitic, and PH Stainless Steels (340–450 HB) (36–48 HRC)

speed — m/min

material group	grade	105	135	165	195	225	255	285	315	345	Starting Conditions m/min
P6	WP05CT										200
	WP15CT										180
	WP25CT										150
	WP35CT										105
	WS10PT/WU10PT										150

Cutting Speed Recommendation • M • Metric

Austenitic Stainless Steel — speed — m/min — Starting Conditions

material group	grade	90	135	180	225	270	315	360	405	450	m/min
M1	WM15CT										180
	WM25CT										150
	WM35CT										120
	WS10PT										215
	WS25PT										180

Austenitic Stainless Steel — speed — m/min — Starting Conditions

material group	grade	90	135	180	225	270	315	360	405	450	m/min
M2	WM15CT										165
	WM25CT										140
	WM35CT										105
	WS10PT										200
	WS25PT										165

Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture) — speed — m/min — Starting Conditions

material group	grade	90	135	180	225	270	315	360	405	450	m/min
M3	WM15CT										150
	WM25CT										120
	WM35CT										90
	WS10PT										185
	WS10PT/WU25PT										150

Cutting Speed Recommendation • K • Metric

Gray Cast Iron — speed — m/min — Starting Conditions

material group	grade	60	180	305	430	550	675	800	920	1040	1160	m/min
K1	WK05CT											450
	WK15CT											360
	WK20CT											300

Ductile, Compacted Graphite, and Malleable Cast Irons (<600 MPa tensile strength) — speed — m/min — Starting Conditions

material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
K2	WS10PT/WU10PT											200
	WK05CT											360
	WK15CT											270
	WK20CT											240

Ductile, Malleable, and Austempered Cast Irons (>600 MPa tensile strength) — speed — m/min — Starting Conditions

material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
K3	WS10PT/WU10PT											150
	WK05CT											240
	WK15CT											215
	WK20CT											210

Cutting Speed Recommendation • N • Metric

Low-Silicon Aluminum Alloys (hypoeutectic <12.2% Si) and Magnesium Alloys

Speed — m/min

material group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2500	Starting Conditions m/min
N1	WU10HT											488

Low-Silicon Aluminum Alloys (hypoeutectic <12,2% Si) and Magnesium Alloys

Speed — m/min

material group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2250	Starting Conditions m/min
N2	WU10HT											488

High-Silicon Aluminum Alloys (hypereutectic >12,2% Si) and Magnesium Alloys

Speed — m/min

material group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2500	Starting Conditions m/min
N3	WU10HT											488
	WU05PT											550

Copper-, Brass-, Zinc-Based on a Machinability Index Range of 70–100

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N4	WU10HT					259
	WU05PT					275

Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass, and Glass

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N5	WU10HT					170
	WU05PT					170

Carbon and Graphite Composites: Brush Alloys, Kevlar, and Graphite (280–400 HB) (30–43 HRC)

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N6	WU05PT					200

MMCs (Aluminum-Based Metal Matrix Composites)

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N7	WU10HT					180

Tin Alloys, Cast: ASTM 823, Alloys 1, 2, 3, 11

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N8	WU05PT					215

Cutting Speed Recommendation • S • Metric

Iron-Based, Heat-Resistant Alloys
(135–320 HB) (≤34 HRC)

speed — m/min

material group	grade	15	45	75	105	140	170	200	230	290	310	Starting Conditions m/min
S1	WU10HT											30
	WS10PT/WU10PT											55
	WS25PT/WU25PT											40
	WM15CT											55
	WM25CT/WM35CT											40

Cobalt-Based, Heat-Resistant Alloys
(150–425 HB) (≤45 HRC)

speed — m/min

material group	grade	15	45	75	105	140	170	200	230	290	310	Starting Conditions m/min
S2	WU10HT											35
	WS10PT/WU10PT											60
	WS25PT/WU25PT											30
	WM15CT											60
	WM25CT/WM35CT											30

Nickel-Based, Heat-Resistant Alloys
(140–475 HB) (≤48 HRC)

speed — m/min

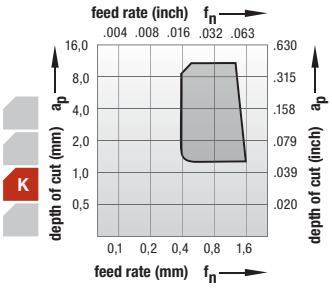
material group	grade	15	45	75	105	140	170	200	230	290	310	Starting Conditions m/min
S3	WU10HT											40
	WS10PT/WU10PT											70
	WS25PT/WU25PT											40
	WM15CT											70
	WM25CT/WM35CT											40

Titanium and Titanium Alloys
(110–450 HB) (≤48 HRC)

speed — m/min

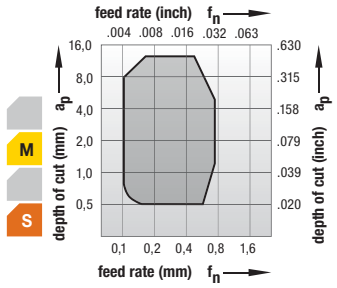
material group	grade	15	45	75	105	140	170	200	230	290	310	Starting Conditions m/min
S4	WU10HT											45
	WM15CT											70
	WM25CT/WM35CT											55

Negative Inserts



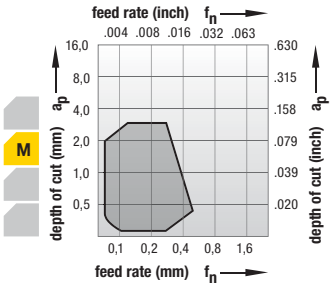
..MA

Flat-top geometry for machining cast iron. For finishing to roughing applications.



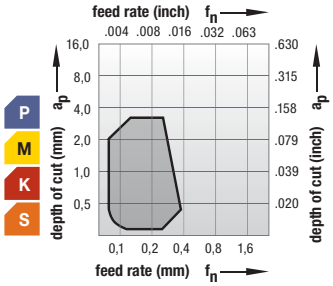
.NMP

For medium-duty machining of tough work materials, such as chrome- and nickel-based alloys. Minimizes tendency for materials to adhere to insert.



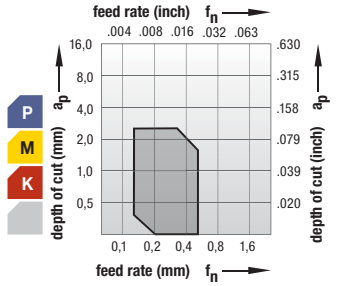
CT

Designed for outward copy turning. Where other geometries produce long chips, the unique distribution of the cut results in good chip control.



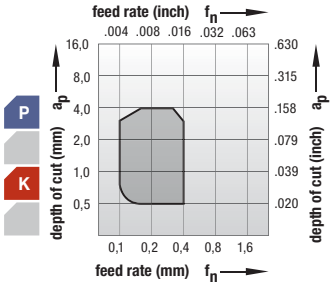
FF

For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



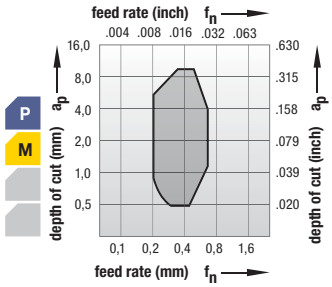
FW

Wiper geometry for finishing when good surface finish is needed using high feed rates. First choice for high-performance finishing.



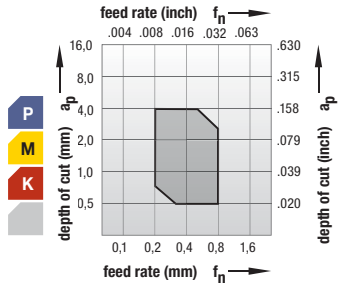
ML

For finishing to medium machining with a negative, stable cutting edge.



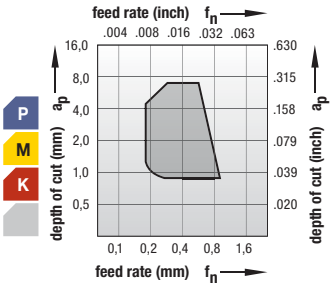
MR

For medium to light roughing of steels, difficult-to-machine high-alloy titanium, and aluminum materials. High strength to deal with heavy chip deformation.



MW

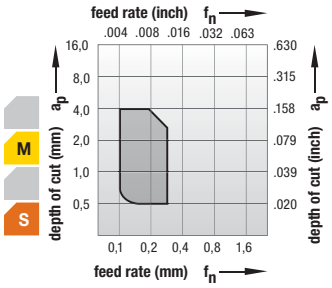
Wiper geometry for light to medium turning with high feed rates. Feed twice as high as with edges with full corner radii to produce same surface finish.



RH

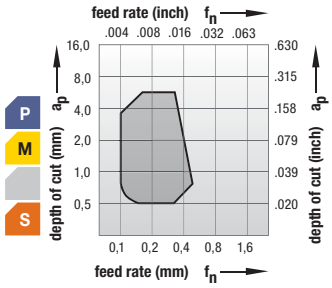
For medium-duty to roughing. Outstanding chip control. High edge strength for interrupted cuts, forging skin, or scale. Preferred for all cast iron, such as gray, malleable, and nodular.

Negative Inserts



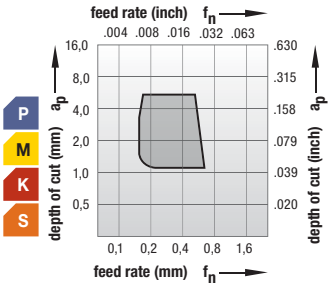
UF

For finishing with a positive cutting edge for reduced cutting forces and superior surface quality.



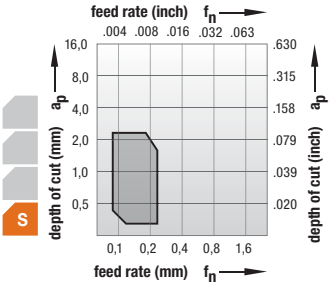
UM

For medium-duty turning operations. Soft-cutting chipbreaker. Used in applications producing varying chip sections, such as profile or copy turning. Good dimensional accuracy. For soft steel materials and stainless steels.



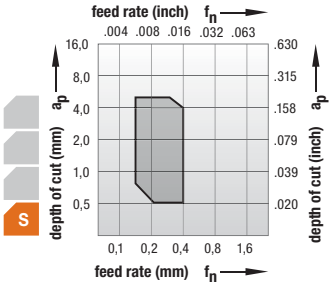
UR

Roughing geometry with smooth chip forming and improved coolant flow for increased tool life. Positive geometry reduces cutting forces and improves depth-of-cut notching resistance. Ideally suitable for stainless steel applications and for smooth machining of steel.



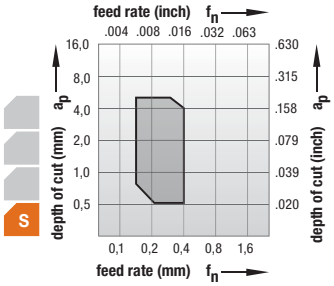
FS

For finishing applications. Ground periphery with positive cutting edge ideally suited for high-temp alloys. Micro-finished edge on the ground periphery adds just a slight hone for improved edge integrity and reliability.



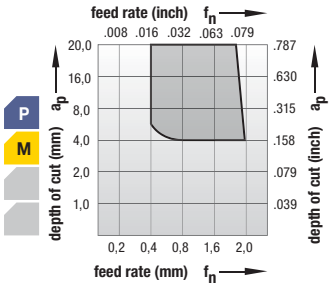
MS

For medium machining in high-temp materials. Utilizes a micro-finished edge preparation to increase edge toughness.



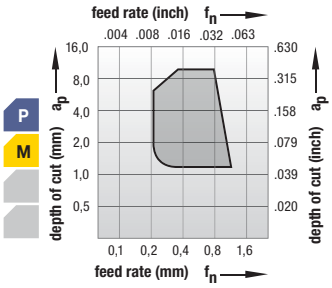
.NGP

For medium-duty machining of tough work materials, such as chrome- and nickel-based alloys. Minimizes tendency for materials to adhere to insert.



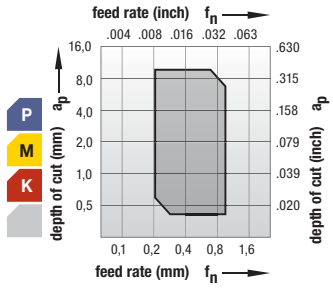
SR

A super-roughing geometry. The –SR has a strong cutting edge to support high cutting loads in roughing applications. Can produce high metal removal rates.



65

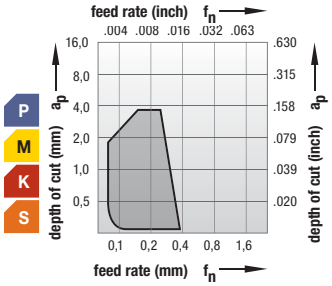
Rough-turning geometry with chip control extending to the medium-duty range. Positive rake angle lowers cutting forces, reducing power requirements. Used on low-tensile and stainless steels.

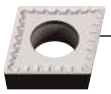


-RU

Positive geometry for smooth cutting. Positive T-land with rake angle to lower cutting forces and improve DOCN resistance. Post-coat grinding of seating surface for secure seating surface. Good edge strength for interrupted cuts, forging skin, and casting surfaces.

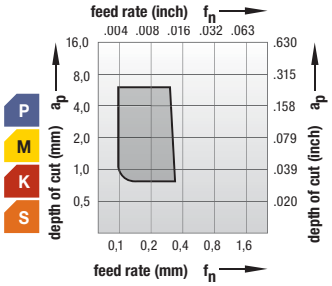
Positive Inserts

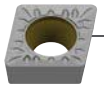




MU

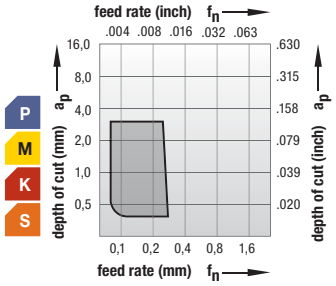
A medium universal geometry with a soft cutting action due to its positive geometry. Has a versatile application range and is suited for turning unstable components and for boring applications.





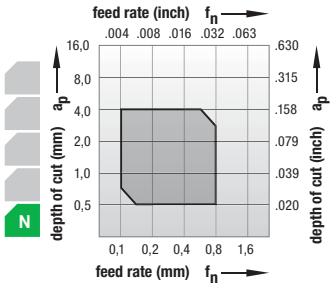
MP

For medium to rough turning with reduced cutting forces and improved chip control for high feed rates. Suitable for high metal removal rates and spindling applications.



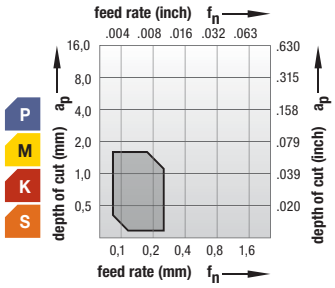
FP

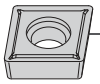
For finishing to medium turning operations with optimal chip control over a wide range of cutting conditions and workpiece materials.



-AL

For cost-effective machining of aluminum, non-ferrous metals, and plastics. Extremely sharp cutting edges result in optimum part finishes with low cutting forces and short chips.





1P

Preferred for light finishing. Low cutting forces and reduced power requirements due to positive rake angle. Good chip control over a wide range.

P Steel Turning

Crankshaft/Camshaft
Roughing and Finishing

Connecting Rods
Boring

Gears
Roughing and Finishing

Input/Output Shafts

M Stainless Steel Turning

Turbo Charger
Roughing and Finishing

Flanges
Roughing and Finishing

Bearing Housing
Roughing and Finishing

Valve Body
Roughing and Finishing

K Cast Iron Turning

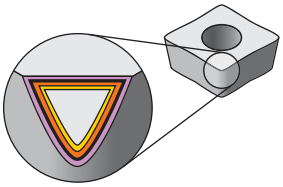
Cylinder Liner
Roughing and Finishing

Engine Block

Brake Drum and Disc

Hub
Roughing and Finishing

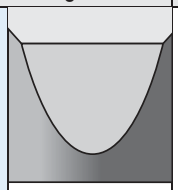
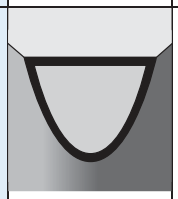
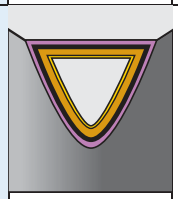
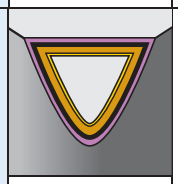
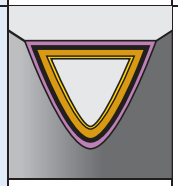
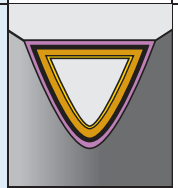
Grades and Grade Descriptions



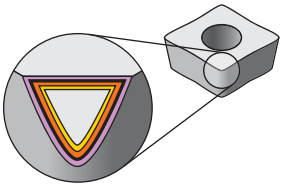
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ⟷ toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
TTR	 HW-P35	Uncoated carbide. Tough grade for medium to rough turning applications in steel. Suitable for interrupted cuts and unfavorable conditions.	P						■	■	■	
WP20TT	 HT-P05	Uncoated cermet. Highly wear-resistant grade suitable for finish turning applications in steel in continuous cuts. Gives excellent surface finish.	P	■	■							
WP05CT	 HC-P10	**Composition:** A deformation-resistant, cobalt-enriched substrate combined with thick MTCVD TiCN-Al_2O_3 coating. **Application:** For high productivity turning of steels and PH stainless steels in continuous to lightly interrupted cuts. This grade provides excellent combination of toughness and high-speed wear resistance allowing the fastest steel part production. Its unique combination of substrate and coating also makes it an ideal roughing grade for cast iron where chipping resistance is required.	P	■	■	■						
			K					■	■	■		
WP15CT	 HC-P15	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-ZrCN. Good balance of wear resistance and toughness properties. High-productivity machining on smooth to lightly interrupted cuts. For steels.	P		■	■	■					
			K				■	■				
WP25CT	 HC-P25	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-ZrCN. Good toughness properties. Excellent first choice for steel machining, high-productivity metal removal for all but the harshest interrupted cuts.	P				■	■	■			
			K						■	■		
WP35CT	 HC-P35	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-TiOCN. Proven on all roughing and heavy roughing operations, wet or dry, on interrupted and uninterrupted cuts.	P						■	■	■	
			M					■	■			

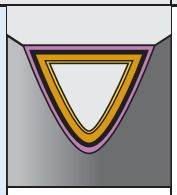
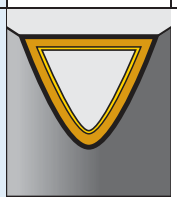
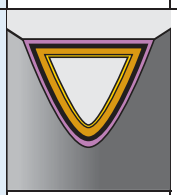
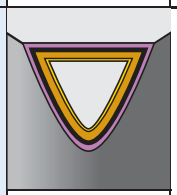
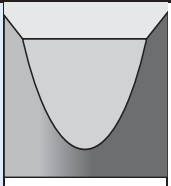
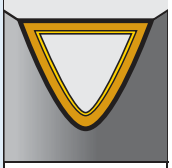
Grades and Grade Descriptions



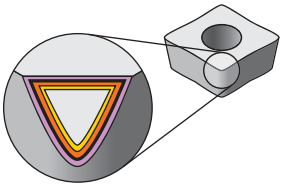
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WM15CT	 HC-M15	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-TiOCN. High degree of wear resistance and good resistance to depth-of-cut notching for long tool life in finishing to medium turning applications.	P				■	■				
			M		■	■	■					
			S		■	■	■					
WM20CT	 HC-K15	A multilayer CVD coated carbide grade with TiN-TiCN-Al_2O_3 coating over a wear-resistant substrate. Suitable for general-purpose/medium machining applications in stainless steels at moderate speeds and feeds. The substrate offers very good toughness and the coating provides high wear resistance, ensuring performance even in interrupted cuts with long tool life.	P					■	■			
			M			■	■	■				
WM25CT	 HC-M25	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-TiOCN. Good balance of wear resistance and toughness properties. Light and medium machining. For austenitic stainless steel AISI series.	P							■	■	
			M				■	■	■			
			S				■	■	■			
WM35CT	 HC-M35	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-TiOCN. Good toughness and wear resistance balance. For medium to roughing operations with light and heavily interrupted cuts.	P								■	■
			M						■	■	■	
			S						■	■	■	
THM	 HW-K15	Uncoated carbide. Extraordinary balance of toughness, wear resistance, edge stability. Suitable for light to medium turning applications in continuous and light interrupted cuts in materials like cast iron and non–ferrous metals.										
			K		■	■	■					
			N		■	■	■					
			S		■	■	■					
WK05CT	 HC-K05	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3. Increased wear resistance for long tool life at high cutting speeds. Enhanced edge strength against depth-of-cut notching in interrupted cuts. Maximum wear resistance for long tool life at high cutting speeds in finish to medium machining.	P	■								
			K	■	■	■						

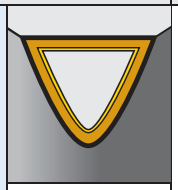
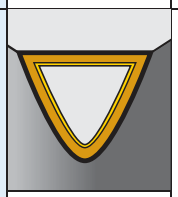
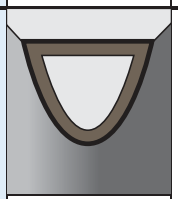
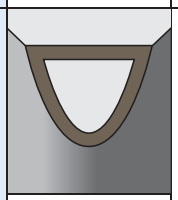
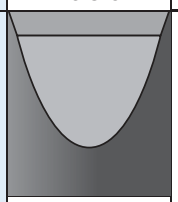
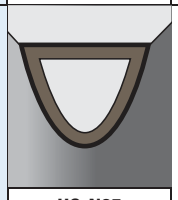
Grades and Grade Descriptions



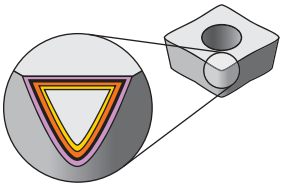
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WK15CT	 HC-M20	**Composition**: A multilayered coating with moderately thick MTCVD TiCN-Al_2O_3 layers over a highly deformation-resistant carbide substrate. **Application**: Designed for high-speed machining of gray and ductile irons. The substrate and coating architecture together with post-coat treatment ensure a tremendous tool life advantage, especially when cutting higher tensile strength ductile and gray irons where workpiece size consistency and reliability of tool life are critical. Excellent both in continuous cuts and varied depths of cut.	P									
			K									
WK20CT	 HC-K20	Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3. First choice for a wide range of machining on all gray and ductile irons, light to heavy machining, smooth or interrupted cuts, and wet or dry.	P									
			K									
WS10PT	 HC-S10	An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. WS10PT™ is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys with improved edge toughness and higher cutting speed and feed capabilities.	P									
			M									
			K									
			N									
			S									
			H									
WS25PT	 HC-S25	An advanced PVD grade with hard AlTiN coating and fine-grain unalloyed substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. WS25PT™ is ideal for general machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials at moderate speeds and over a wide range of feeds, with improved edge toughness for interrupted cut and high feed rates.	P									
			M									
			K									
			N									
			S									
WU10HT	 HW-N10	Uncoated carbide. Highly wear-resistant microfine substrate. Suitable for finish turning applications in aluminum and all types of non-ferrous materials, stainless steel, and high-temp alloys with suitable edge preparation. Mainly applied in continuous cuts.	M									
			N									
			S									
WU05PT	 HC-N05	Coated carbide. PVD AlTiN-coated grade with microfine substrate and highly wear-resistant coating. Suitable for finish turning in aluminum and other non-ferrous materials and also steels, stainless steel, and high-temp alloys with reliability in continuous cuts with suitable edge preparation.	P									
			M									
			K									
			N									
			S									

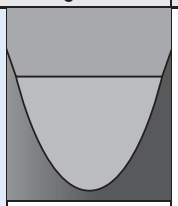
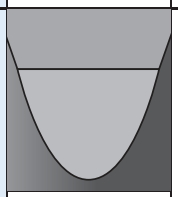
Grades and Grade Descriptions



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WU10PT	 HC-P10	The WU10PT grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, and super alloys under stable conditions.	P									
			M									
			K									
			S									
			H									
WU25PT	 HC-P25	An advanced PVD-Al TiN-coated grade with a tough, ultra-fine-grain, unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium alloys, and cast irons.	P									
			M									
			K									
			S									

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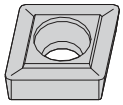
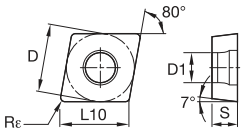
CCMT • Medium Machining



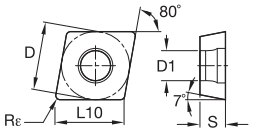


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CCMT060202	6,35	6,45	2,38	0,2	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2031658	-	-	-	-
CCMT060204	6,35	6,45	2,38	0,4	2,80	-	-	-	-	-	-	-	-	6671876	-	-	-	-	-	-	2031666	2031668	-	-	-
CCMT090304	9,53	9,67	3,18	0,4	4,40	-	-	-	6128252	-	-	-	-	6671877	-	-	-	-	-	-	2031693	2031695	-	-	-
CCMT090308	9,53	9,67	3,18	0,8	4,40	-	-	-	6128253	-	-	-	-	-	-	-	-	-	-	-	2031706	2027339	-	-	-
CCMT09T304	9,53	9,67	3,97	0,4	4,40	-	-	-	-	-	-	-	-	6613610	-	-	-	-	-	-	2031723	-	-	-	-
CCMT09T308	9,53	9,67	3,97	0,8	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2599478	-	-	-	-
CCMT09T308	9,53	9,67	3,97	0,8	4,40	-	-	-	-	-	-	-	-	6613604	-	-	-	-	-	-	2027432	-	-	-	-
CCMT120408	12,70	12,90	4,76	0,8	5,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2581348	-	-	-	-
CCMT120408	12,70	12,90	4,76	0,8	5,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027472	-	-	-	-

CCMT-FP • Finishing Positive

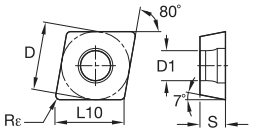


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CCMT060202FP	6,35	6,45	2,38	0,2	2,80	-	4169857	4170140	-	-	4168778	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT060204FP	6,35	6,45	2,38	0,4	2,80	-	4169858	4170141	-	4168738	4168779	-	-	-	4170032	5684337	5684340	-	-	6208108	-	-	-	-	-
CCMT060208FP	6,35	6,45	2,38	0,8	2,80	-	-	4170142	-	-	4168780	-	-	-	-	5684342	5684344	-	-	-	-	-	-	-	-
CCMT09T302FP	9,53	9,67	3,97	0,2	4,40	-	-	4170293	-	-	4168781	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T304FP	9,53	9,67	3,97	0,4	4,40	-	4169860	4170294	-	-	4168782	-	-	-	4170084	5684341	5684343	-	-	-	-	-	-	-	-
CCMT09T308FP	9,53	9,67	3,97	0,8	4,40	-	4169861	4170295	-	4168741	4168783	-	-	-	4170085	-	5684338	-	-	-	-	-	-	-	-
CCMT120404FP	12,70	12,90	4,76	0,4	5,50	-	-	4170296	-	-	4168784	-	-	-	4170086	-	-	-	-	-	-	-	-	-	-
CCMT120408FP	12,70	12,90	4,76	0,8	5,50	-	4169993	4170297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CCMT-MP • Medium Positive

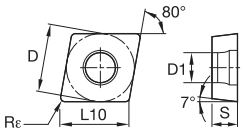


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CCMT060204MP	6,35	6,45	2,38	0,4	2,80	-	4170197	4170217	-	-	4168906	-	-	-	4170237	5684351	-	-	-	6208252	-	-	-	-	-
CCMT09T304MP	9,53	9,67	3,97	0,4	4,40	-	4170198	4170218	-	-	4168907	-	-	-	4170238	5684352	-	-	-	-	-	-	-	-	-
CCMT09T308MP	9,53	9,67	3,97	0,8	4,40	-	4170199	4170219	-	-	4168908	-	-	-	4170239	5684350	-	-	-	-	-	-	-	-	-
CCMT09T312MP	9,53	9,67	3,97	1,2	4,40	-	-	4170220	-	-	4168909	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120408MP	12,70	12,90	4,76	0,8	5,50	-	4170200	4170221	-	-	4168910	-	-	6730909	4170240	5684349	-	-	-	-	-	-	-	-	-
CCMT120412MP	12,70	12,90	4,76	1,2	5,50	-	-	4170222	-	-	4168911	-	-	6730910	4170241	-	-	-	-	-	-	-	-	-	-

CCMT-MU • Medium Universal

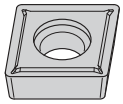


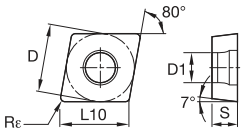
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CCMT060208MU	6,35	6,45	2,38	0,8	2,80	-	-	-	-	-	5623159	-	-	-	5623158	-	-	-	-	-	-	-	-	6942279	6868872
CCMT090304MU	9,53	9,67	3,18	0,4	4,40	-	-	5623420	-	-	5623421	-	-	-	6208257	-	-	-	-	-	-	-	-	-	-
CCMT090308MU	9,53	9,67	3,18	0,8	4,40	-	5623425	5623424	-	-	5623423	-	-	-	6208258	-	-	-	-	-	-	-	-	-	-
CCMT09T3041P	9,53	9,67	3,97	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6869663	-
CCMT09T304MU	9,53	9,67	3,97	0,4	4,40	-	5623431	5623430	-	-	5623427	-	5623429	-	5623432	5623428	5623426	-	-	-	-	-	-	6942280	6868873
CCMT09T3081P	9,53	9,67	3,97	0,8	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6869664	-
CCMT09T308MU	9,53	9,67	3,97	0,8	4,40	-	5623434	5623436	5623439	-	5623435	-	-	-	5623433	5623438	5623437	-	-	-	-	-	-	6942341	6868874
CCMT120404MU	12,70	12,90	4,76	0,4	5,50	-	6128256	-	-	-	6128254	-	-	-	-	6128258	-	-	-	-	-	-	-	-	-
CCMT120408MU	12,70	12,90	4,76	0,8	5,50	-	5623440	5623443	-	-	5623442	-	-	-	5623441	-	5623444	-	-	-	-	-	-	-	-

CCMT-1P • Finishing



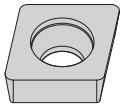


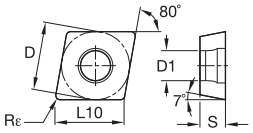
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●		○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CCMT0602041P	6,35	6,45	2,38	0,4	2,80	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	6869661	6868825
CCMT0602081P	6,35	6,45	2,38	0,8	2,80	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	6869662	6868826
CCMT09T3041P	9,53	9,67	3,97	0,4	4,40	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	-	6868827
CCMT09T3081P	9,53	9,67	3,97	0,8	4,40	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	-	6868828

CCMW • Medium Machining



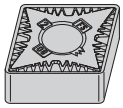


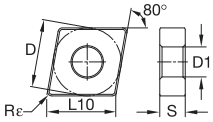
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●			○			●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CCMW060202	6,35	6,45	2,38	0,2	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2031733	-	-	-	-
CCMW060204	6,35	6,45	2,38	0,4	2,84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2564221	-	-	-	-
CCMW060204	6,35	6,45	2,38	0,4	2,84	-	-	-	-	-	-	-	-	-	4170368	-	-	-	-	-	2027507	-	-	-	-
CCMW090302	9,53	9,67	3,18	0,2	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2031734	-	-	-	-
CCMW090304	9,53	9,67	3,18	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2564211	-	-	-	-
CCMW090304	9,53	9,67	3,18	0,4	4,45	-	-	-	-	-	-	-	-	-	4170369	-	-	-	-	-	2027509	-	-	-	-
CCMW090308	9,53	9,67	3,18	0,8	4,45	-	-	-	-	-	-	-	4170466	-	4170370	-	-	-	-	-	-	-	-	-	-
CCMW09T304	9,53	9,67	3,97	0,4	4,45	-	-	-	-	-	-	-	4170467	-	4170371	-	-	-	-	-	2027511	-	-	-	-
CCMW09T308	9,53	9,67	3,97	0,8	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027512	-	-	-	-
CCMW120404	12,70	12,90	4,76	0,4	5,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027524	-	-	-	-
CCMW120408	12,70	12,90	4,76	0,8	5,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2564195	-	-	-	-
CCMW120408	12,70	12,90	4,76	0,8	5,50	-	-	-	-	-	-	-	-	-	4170374	-	-	-	-	-	2027525	-	-	-	-

CNGG-FS • Finishing Sharp



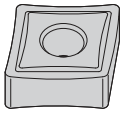


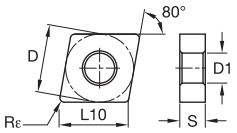
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNGG120401FS	12,70	12,90	4,76	0,1	5,16	-	-	-	-	-	-	-	-	-	-	5548576	-	-	-	-	-	-	-	-	-
CNGG120402FS	12,70	12,90	4,76	0,2	5,16	-	-	-	-	-	-	-	-	-	-	5548575	-	-	-	-	-	-	-	-	-
CNGG120404FS	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5548577	5538204	5549945	-	-	-	-	-	-	-
CNGG120408FS	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5548578	5538205	5549946	-	-	-	-	-	-	-
CNGG120412FS	12,70	12,90	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	5548579	-	-	-	-	-	-	-	-	-

CNGP • Medium Machining



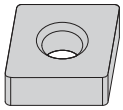


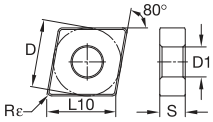
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNGP120401	12,70	12,90	4,76	0,1	5,16	-	-	-	-	-	-	-	-	-	-	5549137	-	-	-	-	-	-	-	-	-
CNGP120402	12,70	12,90	4,76	0,2	5,16	-	-	-	-	-	-	-	-	-	-	5549138	-	5549206	-	-	-	-	-	-	-
CNGP120404	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5549139	-	5549207	-	-	-	-	-	-	-
CNGP120408	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5549190	-	5549208	-	-	-	-	-	-	-

CNMA • Roughing



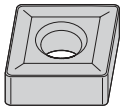


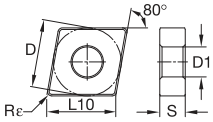
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N											○	○	●	●			○			○	○
S						○					●	●		○			○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMA120404	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559874	-	-	-	-
CNMA120404	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	-	-	4171595	-	4171863	-	-	-	-	-	-	-	-	-	-
CNMA120408	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559845	-	-	-	-
CNMA120408	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	-	-	4171596	6287922	4171864	-	-	-	-	-	-	-	-	-	-
CNMA120412	12,70	12,90	4,76	1,2	5,16	-	-	-	-	-	-	-	4171597	6287923	4171865	-	-	-	-	-	-	-	-	-	-
CNMA120416	12,70	12,90	4,76	1,6	5,16	-	-	-	-	-	-	-	4171598	-	4171866	-	-	-	-	-	-	-	-	-	-
CNMA160612	15,88	16,12	6,35	1,2	6,35	-	-	-	-	-	-	-	4171599	-	4171868	-	-	-	-	-	-	-	-	-	-
CNMA160616	15,88	16,12	6,35	1,6	6,35	-	-	-	-	-	-	-	-	-	4171869	-	-	-	-	-	-	-	-	-	-
CNMA190608	19,05	19,34	6,35	0,8	7,93	-	-	-	-	-	-	-	-	-	4171870	-	-	-	-	-	-	-	-	-	-
CNMA190612	19,05	19,34	6,35	1,2	7,93	-	-	-	-	-	-	-	4171602	-	4171871	-	-	-	-	-	-	-	-	-	-
CNMA190616	19,05	19,34	6,35	1,6	7,93	-	-	-	-	-	-	-	-	-	4171872	-	-	-	-	-	-	-	-	-	-

CNMG • Roughing



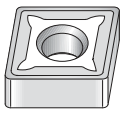


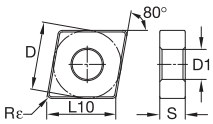
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404	12,70	12,90	4,76	0,4	5,16	'	'	'	'	'	'	'	'	6613606	'	'	'	'	'	'	2559561	'	'	'	'
CNMG120408	12,70	12,90	4,76	0,8	5,16	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	2027567	'	'	'	'
CNMG190612	19,05	19,34	6,35	1,2	7,93	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	2559382	'	'	'	'

CNMG-5 • Roughing



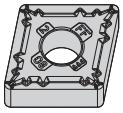


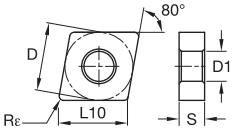
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120408-5	12,70	12,90	4,76	0,8	5,16	'	'	'	'	'	'	'	'	6287924	'	'	'	'	'	'	'	'	'	'	'
CNMG120412-5	12,70	12,90	4,76	1,2	5,16	'	'	'	'	'	'	'	'	6287925	'	'	'	'	'	'	'	'	'	'	'

CNMG-FF • Fine Finishing



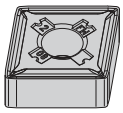


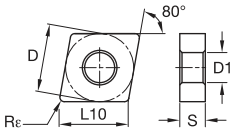
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404FF	12,70	12,90	4,76	0,4	5,16	-	4171025	-	-	-	4172345	-	-	-	4171318	-	-	-	-	-	-	-	-	-	-
CNMG120408FF	12,70	12,90	4,76	0,8	5,16	-	4171026	-	-	-	4172346	-	-	-	4171319	-	-	-	-	-	-	-	-	-	-
CNMG120412FF	12,70	12,90	4,76	1,2	5,16	-	4171027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-FW • Finishing Wiper



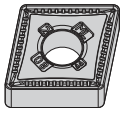


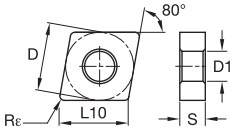
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120408FW	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	4173103	-	4171681	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-ML • Medium Machining



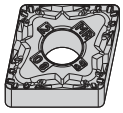


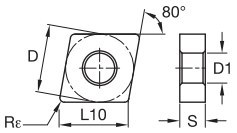
● first choice
○ alternate choice

		WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404ML	12,70	12,90	4,76	0,4	5,16	-	4171059	4170458	-	-	-	-	-	-	4171390	-	-	-	-	-	-	-	-	-	-
CNMG120408ML	12,70	12,90	4,76	0,8	5,16	-	4171060	4170459	-	-	-	-	4171658	-	4171391	-	-	-	-	-	-	-	-	-	-
CNMG120412ML	12,70	12,90	4,76	1,2	5,16	-	-	4170460	-	-	-	-	-	-	4171392	-	-	-	-	-	-	-	-	-	-

CNMG-MR • Medium Roughing



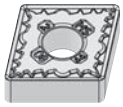


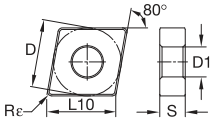
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M					○	●	●	●				●	●		○				●	●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○	
N												○	○	●	●		○			○	○	
S							○					●	●		○		○		○	●	●	
H																				○		

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404MR	12,70	12,90	4,76	0,4	5,16	-	4171130	4170546	4170043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG120408MR	12,70	12,90	4,76	0,8	5,16	-	4171131	4170547	4170044	-	4172955	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG120412MR	12,70	12,90	4,76	1,2	5,16	-	4171132	4170548	4170045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG120416MR	12,70	12,90	4,76	1,6	5,16	-	-	5684353	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG160608MR	15,88	16,12	6,35	0,8	6,35	-	4171134	4170549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG160612MR	15,88	16,12	6,35	1,2	6,35	-	4171135	4170550	4170046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG160616MR	15,88	16,12	6,35	1,6	6,35	-	4171136	4170551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG190612MR	19,05	19,34	6,35	1,2	7,93	-	4171137	4170552	-	-	4172961	4173136	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG190616MR	19,05	19,34	6,35	1,6	7,93	-	4171138	4170563	-	-	4172962	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-MS • Medium Sharp



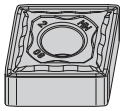


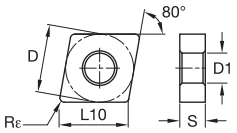
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M					○	●	●	●				●	●		○				●	●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○	
N												○	○	●	●		○			○	○	
S							○					●	●		○		○		○	●	●	
H																				○		

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404MS	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5908742	5908743	5908744	-	-	-	-	-	-	-
CNMG120408MS	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908745	5908746	5908747	-	-	-	-	-	-	-
CNMG120412MS	12,70	12,90	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	5908748	5908749	-	-	-	-	-	-	-	-
CNMG120416MS	12,70	12,90	4,76	1,6	5,16	-	-	-	-	-	-	-	-	-	-	5908751	-	-	-	-	-	-	-	-	-
CNMG160608MS	15,88	16,12	6,35	0,8	6,35	-	-	-	-	-	-	-	-	-	-	5908754	5908755	5908756	-	-	-	-	-	-	-
CNMG160612MS	15,88	16,12	6,35	1,2	6,35	-	-	-	-	-	-	-	-	-	-	5908757	5908758	5908759	-	-	-	-	-	-	-
CNMG190608MS	19,05	19,34	6,35	0,8	7,93	-	-	-	-	-	-	-	-	-	-	5908760	5908761	5908762	-	-	-	-	-	-	-
CNMG190612MS	19,05	19,34	6,35	1,2	7,93	-	-	-	-	-	-	-	-	-	-	5908763	5908764	-	-	-	-	-	-	-	-
CNMG190616MS	19,05	19,34	6,35	1,6	7,92	-	-	-	-	-	-	-	-	-	-	5908766	5908767	-	-	-	-	-	-	-	-

CNMG-MW • Medium Wiper





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
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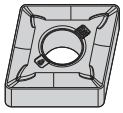
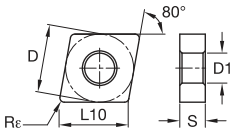
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120408MW	12,70	12,90	4,76	0,8	5,16	-	-	-	-	-	4173112	-	4171682	-	-	-	-	-	-	-	-	-	-	-	-
CNMG120412MW	12,70	12,90	4,76	1,2	5,16	-	-	-	-	-	4173113	-	4171684	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-RH • Roughing





● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
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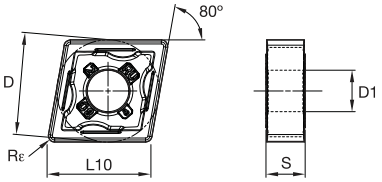
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120408RH	12,70	12,90	4,76	0,8	5,16	-	4170979	4171504	5684356	-	4173035	-	-	6288264	4171903	-	-	-	-	-	-	-	-	-	-
CNMG120412RH	12,70	12,90	4,76	1,2	5,16	-	4170980	4171505	4171698	-	4173036	-	-	6288265	4171904	-	-	-	-	-	-	-	-	-	-
CNMG120416RH	12,70	12,90	4,76	1,6	5,16	-	4170981	4171506	4171699	-	-	-	-	-	4171905	-	-	-	-	-	-	-	-	-	-
CNMG160608RH	15,88	16,12	6,35	0,8	6,35	-	4170982	4171507	4171700	-	4173038	-	-	-	4171906	-	-	-	-	-	-	-	-	-	-
CNMG160612RH	15,88	16,12	6,35	1,2	6,35	-	4170983	4171508	4171701	-	-	-	-	-	4171907	-	-	-	-	-	-	-	-	-	-
CNMG160616RH	15,88	16,12	6,35	1,6	6,35	-	4170984	4171509	4171702	-	-	-	-	-	4171908	-	-	-	-	-	-	-	-	-	-
CNMG190608RH	19,05	19,34	6,35	0,8	7,93	-	4170985	4171510	4171703	-	4173041	-	-	-	4171909	-	-	-	-	-	-	-	-	-	-
CNMG190612RH	19,05	19,34	6,35	1,2	7,93	-	4170986	4171511	4171704	-	4173042	-	-	-	4171910	-	-	-	-	-	-	-	-	-	-
CNMG190616RH	19,05	19,34	6,35	1,6	7,93	-	4170987	4171512	4171705	-	4173043	-	-	-	4171911	-	-	-	-	-	-	-	-	-	-
CNMG190624RH	19,05	19,34	6,35	2,4	7,93	-	-	4171523	4171706	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-RU • Roughing Universal

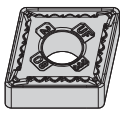


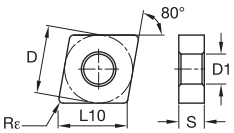
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120408RU	12,70	12,90	4,76	0,8	5,16	-	6690250	6690247	-	6817522	6817756	-	-	6678403	6690253	-	-	-	-	-	-	-	-	-	6795793
CNMG120412RU	12,70	12,90	4,76	1,2	5,16	-	6690251	6690248	-	6817523	6817757	-	-	6678404	6690254	-	-	-	-	-	-	-	-	-	6795794

CNMG-UF • Fine Finishing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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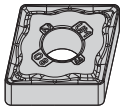
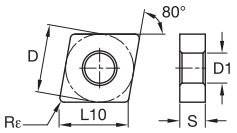
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404UF	12,70	12,90	4,76	0,4	5,16	-	-	-	-	4169353	4169379	-	-	-	-	5645600	-	-	-	-	-	-	-	-	-
CNMG120408UF	12,70	12,90	4,76	0,8	5,16	-	-	-	-	4169354	4169380	-	-	-	-	5645588	-	-	-	-	-	-	-	-	-
CNMG120412UF	12,70	12,90	4,76	1,2	5,16	-	-	-	-	4169355	4169381	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-UM • Medium Machining



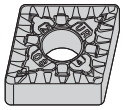


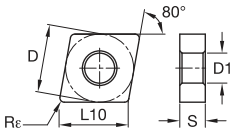
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404UM	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	4172380	4172410	-	-	-	5645217	-	-	-	-	-	-	-	-	-
CNMG120408UM	12,70	12,90	4,76	0,8	5,16	6496789	-	5645219	-	4172335	4172381	4172411	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG120412UM	12,70	12,90	4,76	1,2	5,16	6496790	-	-	-	-	4172382	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMG-UR • Universal Roughing



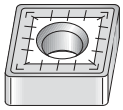


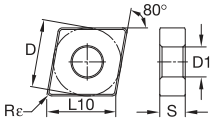
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMG120404UR	12,70	12,90	4,76	0,4	5,16	-	-	4170500	-	4169406	4169444	4169479	-	-	-	5578894	5578895	-	-	-	-	-	-	6942344	6867867
CNMG120408UR	12,70	12,90	4,76	0,8	5,16	-	4171093	4170501	4169960	4169407	4169445	4169480	5680086	-	5680085	5301400	5301402	-	-	-	-	-	-	6795798	6794449
CNMG120412UR	12,70	12,90	4,76	1,2	5,16	-	4171094	4170502	4169961	4169408	4169446	4169481	-	-	4171419	5301413	5301416	-	-	-	-	-	-	6942343	6790714
CNMG120416UR	12,70	12,90	4,76	1,6	5,16	-	-	4170503	-	-	4169447	4169482	-	-	4171420	5680089	-	-	-	-	-	-	-	-	-
CNMG160608UR	15,88	16,12	6,35	0,8	6,35	-	4171096	4170504	-	4169410	4169448	4169483	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMG160612UR	15,88	16,12	6,35	1,2	6,35	-	4171097	4170505	4169962	4169411	4169449	4169484	-	-	4171422	5578898	-	-	-	-	-	-	-	-	-
CNMG160616UR	15,88	16,12	6,35	1,6	6,35	-	4171098	4170506	-	-	4169450	4169485	-	-	4171423	5578900	5578901	-	-	-	-	-	-	-	-
CNMG190612UR	19,05	19,34	6,35	1,2	7,93	-	4171099	4170507	4169964	4169412	4169451	4169486	5680088	-	4171424	-	5512536	-	-	-	-	-	-	-	-
CNMG190616UR	19,05	19,34	6,35	1,6	7,93	-	-	4170508	-	4169423	4169452	4169487	-	-	-	-	5579234	-	-	-	-	-	-	-	-

CNMM-8 • Heavy Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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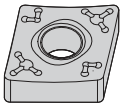
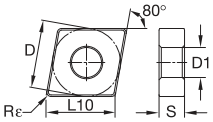
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMM1906168	19,05	19,34	6,35	1,6	7,93	-	-	5418451	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMM-65 • Heavy Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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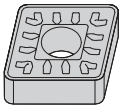
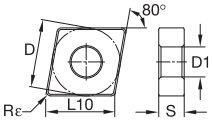
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMM12040865	12,70	12,90	4,76	0,8	5,16	-	5698348	5698349	5698360	-	5698347	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM12041265	12,70	12,90	4,76	1,2	5,16	-	5698362	5698363	-	-	5698361	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM16060865	15,88	16,12	6,35	0,8	6,35	-	-	5698366	5698367	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM16061265	15,88	16,12	6,35	1,2	6,35	-	-	5698370	5698371	-	5698368	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM16061665	15,88	16,12	6,35	1,6	6,35	-	5698372	5698373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM19061265	19,05	19,34	6,35	1,2	7,93	-	-	5491016	5698376	-	5698374	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM19061665	19,05	19,34	6,35	1,6	7,93	-	5698378	-	-	-	5698377	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM19062465	19,05	19,34	6,35	2,4	7,93	-	5698410	5698411	-	-	5698379	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMM-SR • Heavy Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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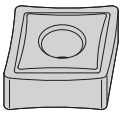
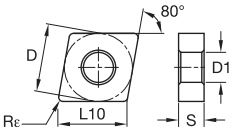
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMM190616SR	19,05	19,34	6,35	1,6	7,93	-	5696643	-	-	-	5696642	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM190624SR	19,05	19,34	6,35	2,4	7,93	-	-	-	5696644	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CNMM250924SR	25,40	25,79	9,53	2,4	9,12	-	5696645	5696646	5696647	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CNMP • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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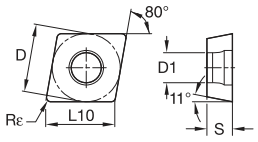
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CNMP120404	12,70	12,90	4,76	0,4	5,16	-	-	-	-	-	4173552	-	-	-	-	4172439	-	-	-	-	-	-	-	-	-
CNMP120408	12,70	12,90	4,76	0,8	5,16	-	-	-	-	4171586	4173653	4173682	-	-	-	4172440	4172614	-	-	-	-	-	-	-	-
CNMP120412	12,70	12,90	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	4172441	4172615	-	-	-	-	-	-	-	-
CNMP190612	19,05	19,34	6,35	1,2	7,93	-	-	-	-	-	-	-	-	-	-	4172483	-	-	-	-	-	-	-	-	-
CNMP190616	19,05	19,34	6,35	1,6	7,93	-	-	-	-	-	4173657	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CPMT-FP • Finishing Positive



● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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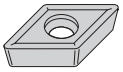
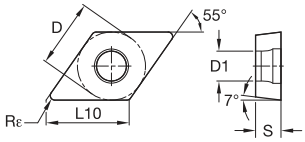
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
CPMT060204FP	6,35	6,45	2,38	0,4	2,80	-	4170016	4170326	-	-	4168823	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CPMT09T308FP	9,53	9,67	3,97	0,8	4,40	-	4170019	4170329	-	-	-	-	-	-	4170108	-	-	-	-	-	-	-	-	-	-

DCMT • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
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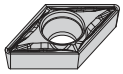
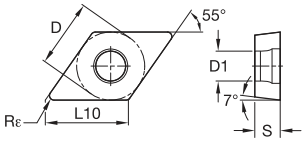
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DCMT070204	6,35	7,75	2,38	0,4	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027768	-	-	-	-
DCMT11T304	9,53	11,63	3,97	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027805	2027807	-	-	-
DCMT11T308	9,53	11,63	3,97	0,8	4,45	-	-	-	-	-	-	-	-	6671913	-	-	-	-	-	-	2027843	-	-	-	-
DCMT11T312	9,53	11,63	3,97	1,2	4,45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027868	-	-	-	-
DCMT150408	12,70	15,50	4,76	0,8	5,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027908	2027910	-	-	-
DCMT150412	12,70	15,50	4,76	1,2	5,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2027932	-	-	-	-

DCMT-FP • Finishing Positive



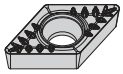


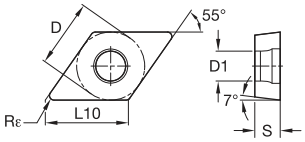
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DCMT070202FP	6,35	7,75	2,38	0,2	2,80	-	-	4170299	-	-	4168787	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT070204FP	6,35	7,75	2,38	0,4	2,80	-	4169995	4170300	-	-	4168788	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT070208FP	6,35	7,75	2,38	0,8	2,80	-	-	4170301	-	-	4168789	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT11T302FP	9,53	11,63	3,97	0,2	4,40	-	4169996	4170302	-	-	4168790	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT11T304FP	9,53	11,63	3,97	0,4	4,40	-	4169997	4170303	-	4168765	4168791	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT11T308FP	9,53	11,63	3,97	0,8	4,40	-	4169998	4170304	-	-	4168792	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT150404FP	12,70	15,50	4,76	0,4	5,50	-	4170000	4170306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT150408FP	12,70	15,50	4,76	0,8	5,50	-	4170001	4170307	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DCMT-MP • Medium Positive



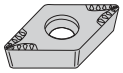


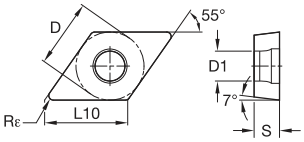
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○		○	●		●		●	●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DCMT11T304MP	9,53	11,63	3,97	0,4	4,40	-	4170201	4170223	-	-	-	-	-	-	4170242	-	-	-	-	6208110	-	-	-	-	-
DCMT11T308MP	9,53	11,63	3,97	0,8	4,40	-	4170202	4170224	-	-	4168912	-	-	-	4170243	-	-	-	-	-	-	-	-	-	-
DCMT11T312MP	9,53	11,63	3,97	1,2	4,40	-	4170213	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DCMT-MU • Medium Universal



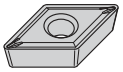


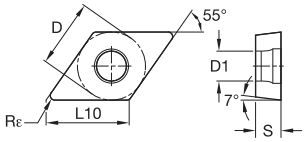
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DCMT070204MU	6,35	7,75	2,38	0,4	2,80	-	6128273	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6942342	6868876
DCMT070208MU	6,35	7,75	2,38	0,8	3,75	-	-	-	-	-	6128276	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCMT11T308MU	9,52	11,63	3,97	0,8	4,40	-	5623600	-	-	-	5623588	-	-	-	5623589	5623601	5623603	-	-	-	-	-	-	6869665	6868877
DCMT11T304MU	9,53	11,63	3,97	0,4	4,40	-	5623585	5623583	-	-	5623581	-	-	-	5623587	5623582	5623584	-	-	-	-	-	-	6869677	6863460
DCMT150404MU	12,70	15,50	4,76	0,4	5,50	-	-	-	-	-	6128281	-	-	-	-	6128282	-	-	-	-	-	-	-	-	-
DCMT150408MU	12,70	15,50	4,76	0,8	5,50	-	5623606	5623608	-	-	5623604	-	-	-	5623607	5623609	5623610	-	-	-	-	-	-	-	-
DCMT150412MU	12,70	15,50	4,76	1,2	5,55	-	-	-	-	-	-	-	-	-	5623612	-	-	-	-	-	-	-	-	-	-

DCMT-1P • Finishing



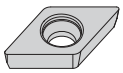


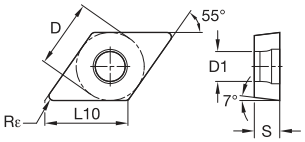
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DCMT11T3041P	9,53	11,63	3,97	0,4	4,40	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	6868829
DCMT11T3081P	9,53	11,63	3,97	0,8	4,40	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	6868830

DCMW • Medium Machining



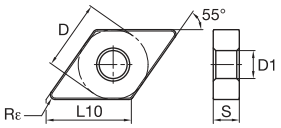


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DCMW070204	6,35	7,75	2,38	0,4	2,80	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	2027966	ı	ı	ı	ı
DCMW11T304	9,53	11,63	3,97	0,4	4,40	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	2027967	ı	ı	ı	ı
DCMW150408	12,70	15,50	4,76	0,8	5,50	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	2031737	ı	ı	ı	ı

DNGG-FS • Finishing Sharp

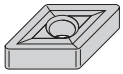


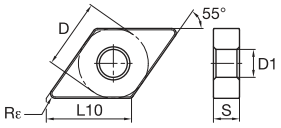
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNGG110402FS	9,53	11,63	4,76	0,2	3,81	-	-	-	-	-	-	-	-	-	-	5548670	-	-	-	-	-	-	-	-	-
DNGG110404FS	9,53	11,63	4,76	0,4	3,81	-	-	-	-	-	-	-	-	-	-	5548671	-	5549948	-	-	-	-	-	-	-
DNGG110408FS	9,53	11,63	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	5548672	-	5549949	-	-	-	-	-	-	-
DNGG150401FS	12,70	15,50	4,76	0,1	5,16	-	-	-	-	-	-	-	-	-	-	5548674	-	-	-	-	-	-	-	-	-
DNGG150402FS	12,70	15,50	4,76	0,2	5,16	-	-	-	-	-	-	-	-	-	-	5548673	-	-	-	-	-	-	-	-	-
DNGG150404FS	12,70	15,50	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5548675	-	5549992	-	-	-	-	-	-	-
DNGG150408FS	12,70	15,50	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	-	-	5549993	-	-	-	-	-	-	-
DNGG150412FS	12,70	15,50	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	5548677	-	5549994	-	-	-	-	-	-	-
DNGG150604FS	12,70	15,50	6,35	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5548678	5538209	5549995	-	-	-	-	-	-	-
DNGG150608FS	12,70	15,50	6,35	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5548679	5538230	5549996	-	-	-	-	-	-	-

DNGP • Medium Machining





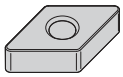
● first choice
○ alternate choice

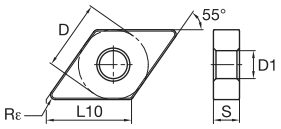
	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●		○	○
N												○	○	●	●		○		○	○
S						○						●	●		○		○		●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNGP150404	12,70	15,50	4,76	0,4	5,16	'	'	'	'	'	'	'	'	'	'	5549193	'	'	'	'	'	'	'	'	'

NOTE: Single sided

DNMA • Roughing



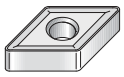


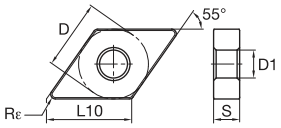
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●		○	○
N												○	○	●	●		○		○	○
S						○						●	●		○		○		●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMA110408	9,53	11,63	4,76	0,8	3,81	'	'	'	'	'	'	'	'	'	4171873	'	'	'	'	'	'	'	'	'	'
DNMA150408	12,70	15,50	4,76	0,8	5,16	'	'	'	'	'	'	'	4171635	'	4171875	'	'	'	'	'	'	'	'	'	'
DNMA150412	12,70	15,50	4,76	1,2	5,16	'	'	'	'	'	'	'	4171636	'	4171876	'	'	'	'	'	'	'	'	'	'
DNMA150608	12,70	15,50	6,35	0,8	5,16	'	'	'	'	'	'	'	4171637	'	4171878	'	'	'	'	'	'	'	'	'	'
DNMA150612	12,70	15,50	6,35	1,2	5,16	'	'	'	'	'	'	'	4171638	'	4171879	'	'	'	'	'	'	'	'	'	'
DNMA150616	12,70	15,50	6,35	1,6	5,16	'	'	'	'	'	'	'	'	'	4171880	'	'	'	'	'	'	'	'	'	'

DNMG • Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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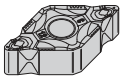
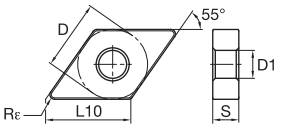
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG150608	12,70	15,50	6,35	0,8	5,16	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	2560240	'	'	'	'
DNMG150608	12,70	15,50	6,35	0,8	5,16	'	'	'	'	'	'	'	'	6671912	'	'	'	'	'	'	'	'	'	'	'

DNMG-CT



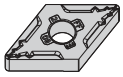


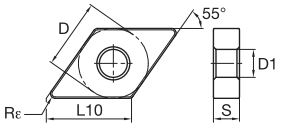
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG150608CT	12,70	15,50	6,35	0,8	5,16	'	'	'	'	'	4172700	'	'	'	'	'	'	'	'	'	'	'	'	'	'

DNMG-FF • Fine Finishing



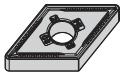


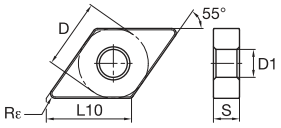
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110404FF	9,53	11,63	4,76	0,4	3,81	-	4171028	-	-	-	-	-	-	-	4171321	-	-	-	-	-	-	-	-	-	-
DNMG110408FF	9,53	11,63	4,76	0,8	3,81	-	4171029	-	-	-	-	-	-	-	4171322	-	-	-	-	-	-	-	-	-	-
DNMG150404FF	12,70	15,50	4,76	0,4	5,16	-	4171030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408FF	12,70	15,50	4,76	0,8	5,16	-	4171031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150604FF	12,70	15,50	6,35	0,4	5,16	-	4171032	-	-	-	-	-	-	-	4171375	-	-	-	-	-	-	-	-	-	-
DNMG150608FF	12,70	15,50	6,35	0,8	5,16	-	4171043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150612FF	12,70	15,50	6,35	1,2	5,16	-	4171044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-ML • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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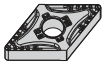
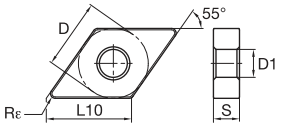
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110404ML	9,53	11,63	4,76	0,4	3,81	-	4171062	4170461	-	-	-	-	4171660	-	4171394	-	-	-	-	-	-	-	-	-	-
DNMG110408ML	9,53	11,63	4,76	0,8	3,81	-	4171063	4170462	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG110412ML	9,53	11,63	4,76	1,2	3,81	-	4171064	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150404ML	12,70	15,50	4,76	0,4	5,16	-	4171065	4170483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408ML	12,70	15,50	4,76	0,8	5,16	-	4171066	4170484	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150412ML	12,70	15,50	4,76	1,2	5,16	-	4171067	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150604ML	12,70	15,50	6,35	0,4	5,16	-	4171068	4170485	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608ML	12,70	15,50	6,35	0,8	5,16	-	4171069	4170486	-	-	-	-	-	-	4171400	-	-	-	-	-	-	-	-	-	-
DNMG150612ML	12,70	15,50	6,35	1,2	5,16	-	4171070	4170487	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-MR • Medium Roughing



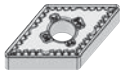


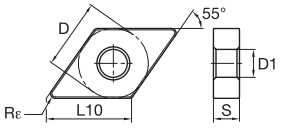
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110408MR	9,53	11,63	4,76	0,8	3,81	-	4171139	4170564	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150404MR	12,70	15,50	4,76	0,4	5,16	-	4171140	4170565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408MR	12,70	15,50	4,76	0,8	5,16	-	4171141	4170566	4170052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150412MR	12,70	15,50	4,76	1,2	5,16	-	4171142	4170567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150604MR	12,70	15,50	6,35	0,4	5,16	-	4171143	4170568	4170054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608MR	12,70	15,50	6,35	0,8	5,16	-	4171144	4170569	4170055	-	4173023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150612MR	12,70	15,50	6,35	1,2	5,16	-	4171145	4170570	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-MS • Medium Sharp





● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
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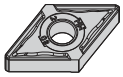
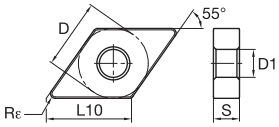
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110408MS	9,53	11,63	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	5908769	5908770	5908781	-	-	-	-	-	-	-
DNMG150404MS	12,70	15,50	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5908782	5908783	-	-	-	-	-	-	-	-
DNMG150408MS	12,70	15,50	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908785	5908787	-	-	-	-	-	-	-	-
DNMG150412MS	12,70	15,50	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	5908789	5908790	-	-	-	-	-	-	-	-
DNMG150604MS	12,70	15,50	6,35	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5908792	5908793	5908794	-	-	-	-	-	-	-
DNMG150608MS	12,70	15,50	6,35	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908795	5908796	5908797	-	-	-	-	-	-	-
DNMG150612MS	12,70	15,50	6,35	1,2	5,16	-	-	-	-	-	-	-	-	-	-	5908798	5908799	5908800	-	-	-	-	-	-	-

DNMG-MW • Medium Wiper





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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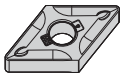
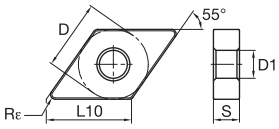
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG150408MW	12,70	15,50	4,76	0,8	5,16	-	-	-	-	-	4173114	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608MW	12,70	15,50	6,35	0,8	5,16	-	-	-	-	-	-	-	4171691	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-RH • Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
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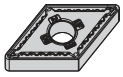
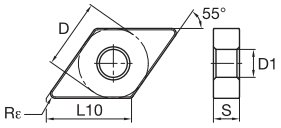
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG150408RH	12,70	15,50	4,76	0,8	5,16	-	-	4171524	4171707	-	-	-	-	-	4171912	-	-	-	-	-	-	-	-	-	-
DNMG150608RH	12,70	15,50	6,35	0,8	5,16	-	4170991	4171526	4171709	-	-	-	-	6730880	4171914	-	-	-	-	-	-	-	-	-	-
DNMG150612RH	12,70	15,50	6,35	1,2	5,16	-	4170992	4171527	4171710	-	-	-	-	6730901	4171915	-	-	-	-	-	-	-	-	-	-
DNMG150616RH	12,70	15,50	6,35	1,6	5,16	-	-	4171528	4171711	-	-	-	-	-	4171916	-	-	-	-	-	-	-	-	-	-
DNMG190612RH	15,88	19,38	6,35	1,2	6,35	-	4170994	4171529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-UF • Fine Finishing



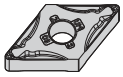


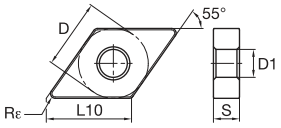
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110404UF	9,53	11,63	4,76	0,4	3,81	-	-	-	-	4169356	4169382	-	-	-	-	5645603	-	-	-	-	-	-	-	-	-
DNMG110408UF	9,53	11,63	4,76	0,8	3,81	-	-	-	-	4169357	4169383	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150404UF	12,70	15,50	4,76	0,4	5,16	-	-	-	-	4169358	4169384	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408UF	12,70	15,50	4,76	0,8	5,16	-	-	-	-	4169359	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150604UF	12,70	15,50	6,35	0,4	5,16	-	-	-	-	4169361	4169387	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608UF	12,70	15,50	6,35	0,8	5,16	-	-	-	-	4169362	4169388	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150612UF	12,70	15,50	6,35	1,2	5,16	-	-	-	-	4169363	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-UM • Medium Machining



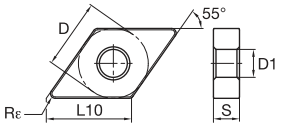


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110404UM	9,53	11,63	4,76	0,4	3,81	-	-	-	-	-	4172383	4172413	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG110408UM	9,53	11,63	4,76	0,8	3,81	-	-	-	-	4172338	4172384	4172414	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150404UM	12,70	15,50	4,76	0,4	5,16	-	-	-	-	-	4172386	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408UM	12,70	15,50	4,76	0,8	5,16	-	-	-	-	4172341	4172387	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150604UM	12,70	15,50	6,35	0,4	5,16	-	-	-	-	-	4172389	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608UM	12,70	15,50	6,35	0,8	5,16	-	-	-	-	4172364	4172390	4172420	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150612UM	12,70	15,50	6,35	1,2	5,16	-	-	-	-	-	4172391	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150616UM	12,70	15,50	6,35	1,6	5,16	-	-	-	-	-	4172392	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMG-UR • Universal Roughing

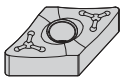


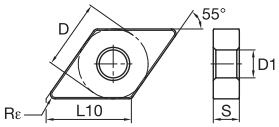
● first choice
○ alternate choice

P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMG110408UR	9,53	11,63	4,76	0,8	3,81	-	4171101	4170509	-	4169424	4169453	4169488	-	-	-	-	-	-	-	-	-	-	-	6942345	6867868
DNMG110412UR	9,53	11,63	4,76	1,2	3,81	-	4171102	4170510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408UR	12,70	15,50	4,76	0,8	5,16	-	4171103	4170511	-	-	4169454	-	-	-	4171428	-	5579271	-	-	-	-	-	-	-	-
DNMG150412UR	12,70	15,50	4,76	1,2	5,16	-	-	4170512	-	-	-	-	-	-	-	-	5579292	-	-	-	-	-	-	-	-
DNMG150608UR	12,70	15,50	6,35	0,8	5,16	-	4171105	4170513	4169969	4169427	4169456	4169492	-	-	4171431	-	5579276	-	-	-	-	-	-	6942346	6867869
DNMG150612UR	12,70	15,50	6,35	1,2	5,16	-	4171106	4170514	-	-	4169457	4169493	5680172	-	4171432	-	-	-	-	-	-	-	-	6942347	6867870
DNMG150616UR	12,70	15,50	6,35	1,6	5,16	-	-	4170515	-	-	-	4169494	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMM-65 • Heavy Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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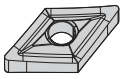
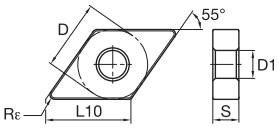
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMM15060865	12,70	15,50	6,35	0,8	5,16	-	5698413	5698414	5698415	-	5698412	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMM15061265	12,70	15,50	6,35	1,2	5,16	-	5698417	5494773	-	-	5698416	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMM15061665	12,70	15,50	6,35	1,6	5,16	-	5698418	5698419	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DNMP • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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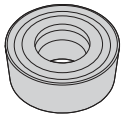
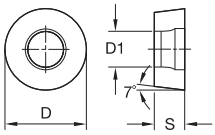
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
DNMP150404	12,70	15,50	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	4172484	-	-	-	-	-	-	-	-	-
DNMP150408	12,70	15,50	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	4172485	-	-	-	-	-	-	-	-	-
DNMP150604	12,70	15,50	6,35	0,4	5,16	-	-	-	-	-	4173661	-	-	-	-	4172486	-	-	-	-	-	-	-	-	-
DNMP150608	12,70	15,50	6,35	0,8	5,16	-	-	-	-	-	4173662	-	-	-	-	4172487	4172616	-	-	-	-	-	-	-	-
DNMP150612	12,70	15,50	6,35	1,2	5,16	-	-	-	-	-	-	-	-	-	-	4172488	4172617	-	-	-	-	-	-	-	-

RCMT • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
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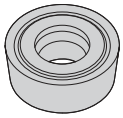
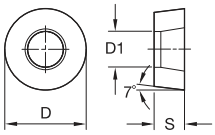
ISO catalogue number	D	S	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
RCMT0602M0	6,00	2,38	2,80	-	4169975	4170536	-	-	-	-	-	-	4170478	-	-	-	-	-	2028115	-	-	-	-
RCMT0803M0	8,00	3,18	3,40	-	4169976	4170537	-	-	-	-	-	-	4170479	-	-	-	-	-	2028129	-	-	-	-
RCMT10T3M0	10,00	3,97	4,40	-	4169977	4170538	4170752	-	-	-	-	-	4170480	-	-	-	-	-	2028143	2028145	-	-	-
RCMT1204M0	12,00	4,76	4,40	-	4169978	4170539	4170803	-	-	-	-	-	4170481	-	-	-	-	-	2028157	-	-	-	-
RCMT1606M0	16,00	6,35	5,50	-	4169979	-	4170804	-	-	-	-	-	4170482	-	-	-	-	-	-	-	-	-	-

RCMX • Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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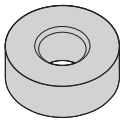
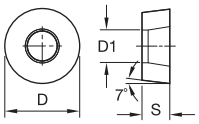
ISO catalogue number	D	S	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
RCMX2006M0	20,00	6,35	6,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2563657	-	-	-
RCMX2006M0T	20,00	6,35	6,50	-	4169980	4170541	4170805	-	-	-	-	-	4170543	-	-	-	-	-	-	-	-	-	-
RCMX2507M0T	25,00	7,94	7,40	-	4169981	-	4170806	-	-	-	-	-	4170544	-	-	-	-	-	-	2028196	-	-	-
RCMX3209M0	32,00	9,53	11,85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2563606	-	-	-
RCMX3209M0T	32,00	9,53	9,50	-	4169982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

RNMA • Roughing



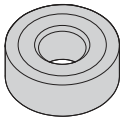


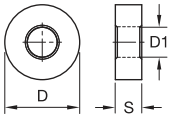
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	S	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
RNMA120400	12,70	4,76	5,16	-	-	-	-	-	-	-	4171639	-	4171881	-	-	-	-	-	-	-	-	-	-

RNMG-RH • Roughing



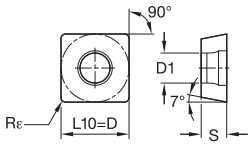


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	S	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
RNMG090300RH	9,53	3,18	3,81	-	-	4171530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RNMG120400RH	12,70	4,76	5,16	-	4170996	4171531	4171713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RNMG190600RH	19,05	6,35	7,93	-	-	4171532	4171714	-	-	-	-	-	4171917	-	-	-	-	-	-	-	-	-	-

SCMT • Medium Machining

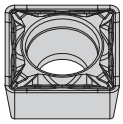


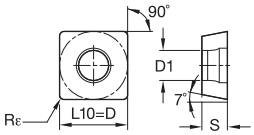
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SCMT090304	9,53	9,53	3,18	0,4	4,45	-	-	-	6128305	-	-	-	-	-	-	-	-	-	-	-	-	2028225	-	-	-
SCMT090308	9,53	9,53	3,18	0,8	4,40	-	-	-	6128306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCMT09T304	9,53	9,53	3,97	0,4	4,45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028255	-	-	-	-
SCMT09T308	9,53	9,53	3,97	0,8	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028270	2028272	-	-	-
SCMT120408	12,70	12,70	4,76	0,8	5,50	-	-	-	6128307	-	-	-	-	-	-	-	-	-	-	-	2028286	2028289	-	-	-
SCMT150512	15,88	15,88	5,56	1,2	5,50	-	-	-	6128308	-	-	-	-	-	-	-	-	-	-	-	2028306	2028307	-	-	-

SCMT-FP • Finishing Positive



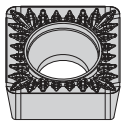


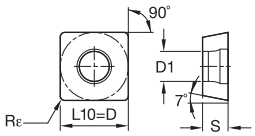
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SCMT09T308FP	9,53	9,53	3,97	0,8	4,40	-	-	4170309	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCMT120408FP	12,70	12,70	4,76	0,8	5,50	-	-	4170311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SCMT-MP • Medium Positive



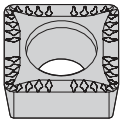


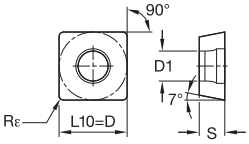
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SCMT09T304MP	9,53	9,53	3,97	0,4	4,40	-	-	4170226	-	-	-	-	-	6730906	4170244	-	-	-	-	-	-	-	-	-	-
SCMT09T308MP	9,53	9,53	3,97	0,8	4,40	-	-	4170227	-	-	4168914	-	-	6730907	4170245	-	-	-	-	-	-	-	-	-	-
SCMT120404MP	12,70	12,70	4,76	0,4	5,50	-	-	4170228	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCMT120408MP	12,70	12,70	4,76	0,8	5,50	-	4170215	4170229	-	-	-	-	-	6730908	4170247	-	-	-	-	-	-	-	-	-	-
SCMT120412MP	12,70	12,70	4,76	1,2	5,50	-	-	4170230	-	-	4168917	-	-	-	4170248	-	-	-	-	-	-	-	-	-	-

SCMT-MU • Medium Universal



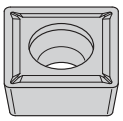


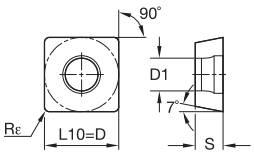
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SCMT090308MU	9,53	9,53	3,18	0,8	4,40	-	5623446	-	-	-	-	-	-	-	5623445	-	-	-	-	-	-	-	-	-	-
SCMT09T304MU	9,53	9,53	3,97	0,4	4,40	-	-	-	-	-	5623447	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCMT09T308MU	9,53	9,53	3,97	0,8	4,40	-	5623461	5623464	5623462	-	5623448	-	-	-	5623449	5623460	6127251	-	-	-	-	-	-	-	6868880
SCMT120408MU	12,70	12,70	4,76	0,8	5,50	-	-	6127255	-	-	6127252	-	-	-	-	-	-	-	-	-	-	-	-	-	6868882
SCMT120412MU	12,70	12,70	4,76	1,2	5,50	-	-	-	-	-	-	-	-	-	-	-	6127256	-	-	-	-	-	-	-	-

SCMT-1P • Finishing



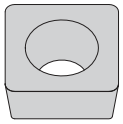


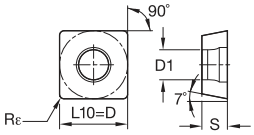
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SCMT1204081P	12,70	12,70	4,76	0,8	5,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6868861

SCMW • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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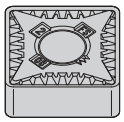
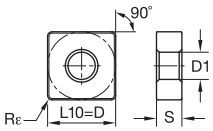
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SCMW090304	9,53	9,53	3,18	0,4	4,40	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	2028308	'	'	'	'
SCMW09T308	9,53	9,53	3,97	0,8	4,40	'	'	'	'	'	'	'	'	'	4170379	'	'	'	'	'	'	'	'	'	'
SCMW120408	12,70	12,70	4,76	0,8	5,50	'	'	'	'	'	'	'	'	'	4170380	'	'	'	'	'	2028310	'	'	'	'

SNGG-FS • Finshing Sharp



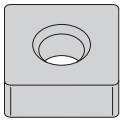


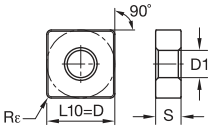
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNGG120408FS	12,70	12,70	4,76	0,8	5,16	'	'	'	'	'	'	'	'	'	'	5548680	'	5549997	'	'	'	'	'	'	'

SNMA • Roughing



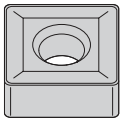


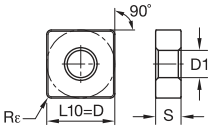
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMA120408	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	-	-	4171640	6287926	4171882	-	-	-	-	-	2028371	-	-	-	-
SNMA120412	12,70	12,70	4,76	1,2	5,16	-	-	-	-	-	-	-	4171641	6287927	4171883	-	-	-	-	-	-	-	-	-	-
SNMA120416	12,70	12,70	4,76	1,6	5,16	-	-	-	-	-	-	-	-	-	4171884	-	-	-	-	-	-	-	-	-	-
SNMA150608	15,88	15,88	6,35	0,8	6,35	-	-	-	-	-	-	-	-	-	4171885	-	-	-	-	-	-	-	-	-	-
SNMA150612	15,88	15,88	6,35	1,2	6,35	-	-	-	-	-	-	-	-	-	4171886	-	-	-	-	-	-	-	-	-	-
SNMA150616	15,88	15,88	6,35	1,6	6,35	-	-	-	-	-	-	-	4171644	-	4171887	-	-	-	-	-	-	-	-	-	-
SNMA190612	19,05	19,05	6,35	1,2	7,93	-	-	-	-	-	-	-	4171645	-	4171888	-	-	-	-	-	-	-	-	-	-
SNMA190616	19,05	19,05	6,35	1,6	7,93	-	-	-	-	-	-	-	4171646	-	4171889	-	-	-	-	-	-	-	-	-	-
SNMA250724	25,40	25,40	7,94	2,4	9,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559949	-	-	-	-
SNMA250724	25,40	25,40	7,94	2,4	9,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559959	-	-	-

SNMG • Roughing



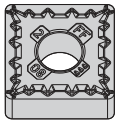


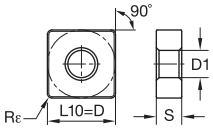
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120408	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559247	-	-	-	-
SNMG120408	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	-	-	-	6613608	-	-	-	-	-	-	-	-	-	-	-
SNMG190612	19,05	19,05	6,35	1,2	7,93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559191	-	-	-	-
SNMG250724	25,40	25,40	7,94	2,4	9,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559116	-	-	-
SNMG250924	25,40	25,40	9,53	2,4	9,12	-	-	-	5091303	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMG-FF • Fine Finishing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
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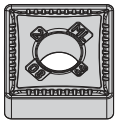
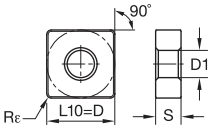
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG090308FF	9,53	9,53	3,18	0,8	3,81	-	4171046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120404FF	12,70	12,70	4,76	0,4	5,16	-	4171047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120408FF	12,70	12,70	4,76	0,8	5,16	-	4171048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120412FF	12,70	12,70	4,76	1,2	5,16	-	4171049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMG-ML • Medium Machining



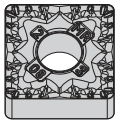


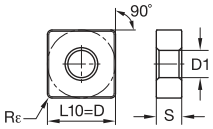
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M					○	●	●	●				●	●		○				●	●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG090304ML	9,53	9,53	3,18	0,4	3,81	-	4171071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG090308ML	9,53	9,53	3,18	0,8	3,81	-	4171072	4170488	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120404ML	12,70	12,70	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	4171403	-	-	-	-	-	-	-	-	-	-
SNMG120408ML	12,70	12,70	4,76	0,8	5,16	-	4171073	4170489	-	-	-	-	-	-	4171404	-	-	-	-	-	-	-	-	-	-
SNMG120412ML	12,70	12,70	4,76	1,2	5,16	-	4171074	4170490	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMG-MR • Medium Roughing



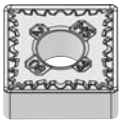


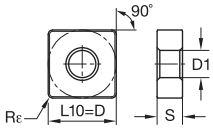
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120408MR	12,70	12,70	4,76	0,8	5,16	-	4171146	4170571	4170057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120412MR	12,70	12,70	4,76	1,2	5,16	-	-	5684355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120416MR	12,70	12,70	4,76	1,6	5,16	-	-	-	-	-	-	4173142	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG150612MR	15,88	15,88	6,35	1,2	6,35	-	4171147	-	-	-	4173029	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190612MR	19,05	19,05	6,35	1,2	7,93	-	4171148	4170572	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMG-MS • Medium Sharp



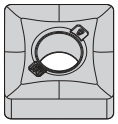


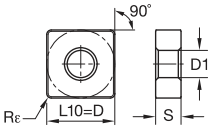
● first choice
○ alternate choice

		WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M						○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120408MS	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908847	5908848	5908849	-	-	-	-	-	-	-
SNMG120412MS	12,70	12,70	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	5908850	5908921	-	-	-	-	-	-	-	-
SNMG120416MS	12,70	12,70	4,76	1,6	5,16	-	-	-	-	-	-	-	-	-	-	6219754	-	-	-	-	-	-	-	-	-
SNMG150612MS	15,88	15,88	6,35	1,2	6,35	-	-	-	-	-	-	-	-	-	-	-	5908923	5908924	-	-	-	-	-	-	-
SNMG190612MS	19,05	19,05	6,35	1,2	7,93	-	-	-	-	-	-	-	-	-	-	5908925	5908926	-	-	-	-	-	-	-	-
SNMG190616MS	19,05	19,05	6,35	1,6	7,94	-	-	-	-	-	-	-	-	-	-	6219756	-	-	-	-	-	-	-	-	-

SNMG-RH • Roughing



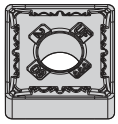


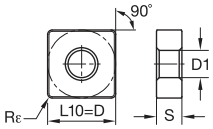
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M					○	●	●	●				●	●		○				●	●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○	
N												○	○	●	●		○			○	○	
S							○					●	●		○		○		○	●	●	
H																				○		

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120408RH	12,70	12,70	4,76	0,8	5,16	-	4170998	4171533	4171715	-	-	-	-	-	4171918	-	-	-	-	-	-	-	-	-	-
SNMG120412RH	12,70	12,70	4,76	1,2	5,16	-	4170999	4171534	4171716	-	-	-	-	-	4171919	-	-	-	-	-	-	-	-	-	-
SNMG120416RH	12,70	12,70	4,76	1,6	5,16	-	4171000	4171535	-	-	-	-	-	-	4171920	-	-	-	-	-	-	-	-	-	-
SNMG150608RH	15,88	15,88	6,35	0,8	6,35	-	4171001	4171536	-	-	-	-	-	-	4171921	-	-	-	-	-	-	-	-	-	-
SNMG150612RH	15,88	15,88	6,35	1,2	6,35	-	4171002	4171537	4171719	-	-	-	-	-	4171922	-	-	-	-	-	-	-	-	-	-
SNMG150616RH	15,88	15,88	6,35	1,6	6,35	-	4171003	4171538	4171720	-	-	-	-	-	4171923	-	-	-	-	-	-	-	-	-	-
SNMG190608RH	19,05	19,05	6,35	0,8	7,93	-	-	4171539	4171721	-	4173055	-	-	-	4171924	-	-	-	-	-	-	-	-	-	-
SNMG190612RH	19,05	19,05	6,35	1,2	7,93	-	4171005	4171540	4171722	-	4173056	-	-	-	4171925	-	-	-	-	-	-	-	-	-	-
SNMG190616RH	19,05	19,05	6,35	1,6	7,93	-	-	-	4171723	-	4173057	-	-	-	4171926	-	-	-	-	-	-	-	-	-	-

SNMG-UF • Fine Finishing



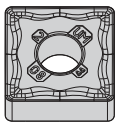


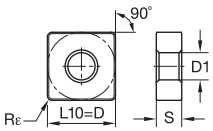
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120404UF	12,70	12,70	4,76	0,4	5,16	-	-	-	-	4169364	4169390	-	-	-	-	5645610	-	-	-	-	-	-	-	-	-
SNMG120408UF	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	4169391	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMG-UM • Medium Machining



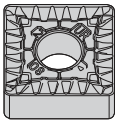


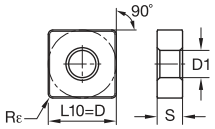
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120404UM	12,70	12,70	4,76	0,4	5,16	-	-	-	-	-	4172393	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120408UM	12,70	12,70	4,76	0,8	5,16	-	-	-	-	4172367	4172394	4172424	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120412UM	12,70	12,70	4,76	1,2	5,16	-	-	-	-	-	4172395	4172425	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMG-UR • Universal Roughing



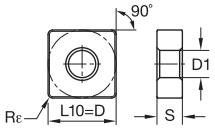


● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M					○	●	●	●				●	●		○					●	●	●
K		○	○	○					●	●	●	○	○		○		●				○	○
N												○	○	●	●		○				○	○
S							○					●	●		○		○		○	●	●
H																					○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMG120408UR	12,70	12,70	4,76	0,8	5,16	-	4171108	4170516	4169989	4169429	4169458	4169495	-	-	4171434	-	-	-	-	-	-	-	-	6942348	6867891
SNMG120412UR	12,70	12,70	4,76	1,2	5,16	-	4171109	4170517	4169990	4169430	4169459	4169496	-	-	-	-	5579350	-	-	-	-	-	-	5384941	6867892
SNMG120416UR	12,70	12,70	4,76	1,6	5,16	-	4171110	-	-	-	4169460	4169497	-	-	4171436	5680174	5680173	-	-	-	-	-	-	-	-
SNMG150612UR	15,88	15,88	6,35	1,2	6,35	-	4171111	4170518	4169991	-	4169461	4169498	-	-	4171437	-	5579352	-	-	-	-	-	-	-	-
SNMG150616UR	15,88	15,88	6,35	1,6	6,35	-	-	4170519	-	-	4169462	4169499	-	-	4171438	-	-	-	-	-	-	-	-	-	-
SNMG190612UR	19,05	19,05	6,35	1,2	7,93	-	4171113	4170520	-	4169433	4169463	4169500	-	-	-	-	5512538	-	-	-	-	-	-	-	-
SNMG190616UR	19,05	19,05	6,35	1,6	7,93	-	4171114	4170521	-	-	4169464	4169501	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMM-8 • Heavy Roughing

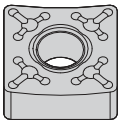


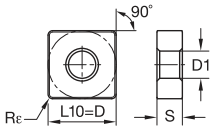
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMM2507248	25,40	25,40	7,94	2,4	9,12	-	5429112	5429111	5370813	-	5429116	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMM-65 • Heavy Roughing



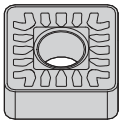


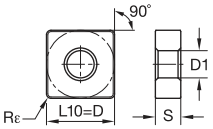
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMM12040865	12,70	12,70	4,76	0,8	5,16	-	-	5696554	5696555	-	5696553	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM12041265	12,70	12,70	4,76	1,2	5,16	-	-	5696557	-	-	5696556	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM15061665	15,88	15,88	6,35	1,6	6,35	-	-	5696559	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM19061265	19,05	19,05	6,35	1,2	7,93	-	5696611	5696612	5696613	-	5696610	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM19061665	19,05	19,05	6,35	1,6	7,93	-	5696615	-	-	-	5696614	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM19062465	19,05	19,05	6,35	2,4	7,93	-	-	5696617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMM-SR • Heavy Roughing



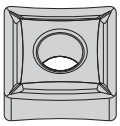


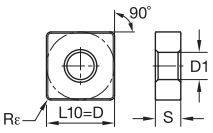
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMM190616SR	19,05	19,05	6,35	1,6	7,93	-	5478876	5478877	-	-	5696648	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190624SR	19,05	19,05	6,35	2,4	7,93	-	5696680	5696681	-	-	5696649	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250724SR	25,40	25,40	7,94	2,4	9,12	-	-	5429119	5946214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250924SR	25,40	25,40	9,53	2,4	9,12	-	5382277	5382390	5373074	-	5402173	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SNMP • Medium Machining



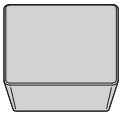


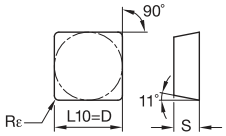
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SNMP120408	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	4173664	-	-	-	-	4172489	4172618	-	-	-	-	-	-	-	-
SNMP120412	12,70	12,70	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	-	4172619	-	-	-	-	-	-	-	-
SNMP150612	15,88	15,88	6,35	1,2	6,35	-	-	-	-	-	-	-	-	-	-	-	4172621	-	-	-	-	-	-	-	-

SPGN/SPG • Medium Machining



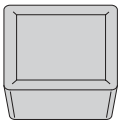


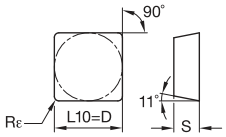
● first choice
○ alternate choice

P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M				○	●	●	●				●	●		○				●	●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○	
N											○	○	●	●		○			○	○	
S						○					●	●		○		○		○	●	●	
H																			○		

ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SPGN090308	9,53	9,53	3,18	0,8	-	-	-	-	-	-	-	-	-	4170943	-	-	-	-	-	-	-	-	-	-

SPMR • Medium Machining



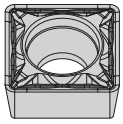


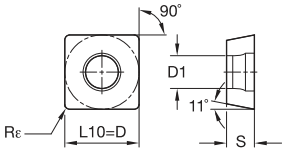
● first choice
○ alternate choice

P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●	●
M				○	●	●	●				●	●		○				●	●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○	
N											○	○	●	●		○			○	○	
S						○					●	●		○		○		○	●	●	
H																			○		

ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SPMR120308	12,70	12,70	3,18	0,8	-	4170854	-	4170652	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SPMT-FP • Finishing Positive



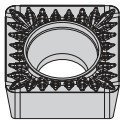


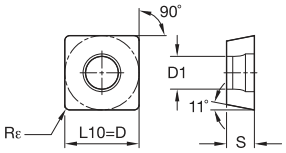
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SPMT09T308FP	9,53	9,53	3,97	0,8	4,40	'	'	'	'	'	'	'	'	'	4170111	'	'	'	'	'	'	'	'	'	'

SPMT-MP • Medium Positive



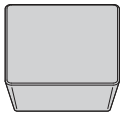


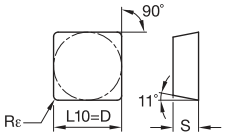
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SPMT09T308MP	9,53	9,53	3,97	0,8	4,40	'	'	'	'	'	'	'	'	'	4170269	'	'	'	'	'	'	'	'	'	'
SPMT120408MP	12,70	12,70	4,76	0,8	5,50	'	'	4170262	'	'	'	'	'	'	4170270	'	'	'	'	'	'	'	'	'	'

SPUN/SPU • Medium Machining



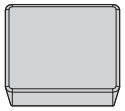


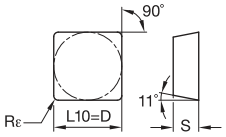
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●		○	○
N											○	○	●	●			○		○	○
S						○					●	●		○			○	○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SPUN090308	9,53	9,53	3,18	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028543	-	-	-	-
SPUN120304	12,70	12,70	3,18	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028547	-	-	-	-
SPUN120308	12,70	12,70	3,18	0,8	-	4170857	-	-	-	-	-	-	-	4170950	-	-	-	-	-	2028555	-	-	-	-
SPUN120312	12,70	12,70	3,18	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2561927	-	-	-	-
SPUN120312	12,70	12,70	3,18	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028560	-	-	-	-
SPUN120412	12,70	12,70	4,76	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028562	-	-	-	-
SPUN150412	15,88	15,88	4,76	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028565	2028567	-	-	-
SPUN190412	19,05	19,05	4,76	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028568	-	-	-	-
SPUN190416	19,05	19,05	4,76	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2561892	-	-	-	-

SPUN-T/SPU-T • Medium Machining



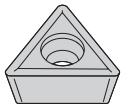


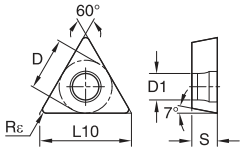
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
SPUN250620T	25,40	25,40	6,35	2,0	-	4170858	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TCMT • Medium Machining



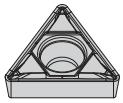


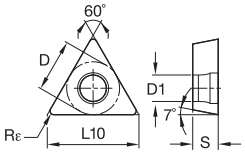
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K	○	○	○						●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TCMT110202	6,35	11,00	2,38	0,2	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028579	-	-	-	-
TCMT110204	6,35	11,00	2,38	0,4	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028587	2028589	-	-	-
TCMT16T304	9,53	16,50	3,97	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028607	-	-	-	-
TCMT16T308	9,53	16,50	3,97	0,8	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028624	2028627	-	-	-
TCMT220408	12,70	22,00	4,76	0,8	5,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028660	-	-	-	-

TCMT-FP • Finishing Positive



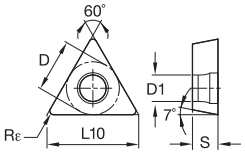


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TCMT110202FP	6,35	11,00	2,38	0,2	2,90	-	-	-	-	-	4168800	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT110204FP	6,35	11,00	2,38	0,4	2,80	-	4170006	4170313	-	-	4168801	-	-	-	4170097	-	-	-	-	6208107	-	-	-	-	-
TCMT110208FP	6,35	11,00	2,38	0,8	2,80	-	4170007	-	-	-	-	-	-	-	4170098	-	-	-	-	-	-	-	-	-	-
TCMT16T304FP	9,53	16,50	3,97	0,4	4,40	-	4170008	4170315	-	-	-	-	-	-	4170099	-	-	-	-	-	-	-	-	-	-
TCMT16T308FP	9,53	16,50	3,97	0,8	4,40	-	-	4170316	-	-	-	-	-	-	4170100	-	-	-	-	-	-	-	-	-	-
TCMT220408FP	12,70	22,00	4,76	0,8	5,50	-	-	4170317	-	-	4168806	-	-	-	4170102	-	-	-	-	-	-	-	-	-	-

TCMT-MP • Medium Positive

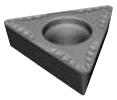


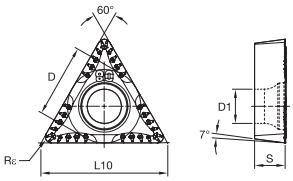
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TCMT110208MP	6,35	11,00	2,38	0,8	2,80	-	-	4170231	-	-	-	-	-	6730905	4170249	-	-	-	-	-	-	-	-	-	-
TCMT16T304MP	9,53	16,50	3,97	0,4	4,40	-	-	4170232	-	4168904	4168918	-	-	-	4170250	-	-	-	-	-	-	-	-	-	-
TCMT16T308MP	9,53	16,50	3,97	0,8	4,40	-	4170216	4170233	-	-	4168919	-	-	6730904	4170251	-	-	-	-	-	-	-	-	-	-
TCMT16T312MP	9,53	16,50	3,97	1,2	4,40	-	-	4170234	-	-	-	-	-	-	4170252	-	-	-	-	-	-	-	-	-	-

TCMT-MU • Medium Universal



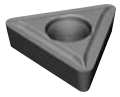


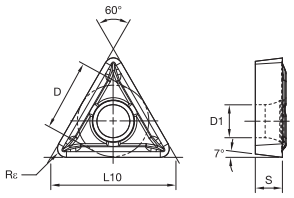
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TCMT16T304MU	9,53	13,89	3,97	0,4	4,40	-	5623614	5623615	-	-	5623613	-	-	-	5623616	-	5623617	-	-	-	-	-	-	-	-
TCMT16T308MU	9,53	16,50	3,97	0,8	4,40	-	5623621	5623620	-	-	5623619	-	-	-	5623618	5623622	-	-	-	-	-	-	-	6869671	6868884
TCMT220412MU	12,70	22,00	4,76	1,2	5,50	-	-	-	6128327	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TCMT-1P • Finishing



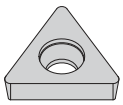


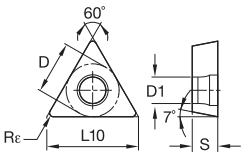
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TCMT1102041P	6,35	11,00	2,38	0,4	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6868862
TCMT1102081P	6,35	11,00	2,38	0,8	2,80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6868863
TCMT16T3041P	9,53	16,50	3,97	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6868865

TCMW • Medium Machining



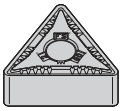


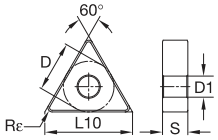
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TCMW110204	6,35	11,00	2,38	0,4	2,85	-	-	-	-	-	-	-	4170476	-	4170381	-	-	-	-	-	2028668	-	-	-	-
TCMW16T304	9,53	16,50	3,97	0,4	4,45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028670	-	-	-	-

TNGG-FS • Finishing Sharp



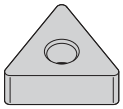


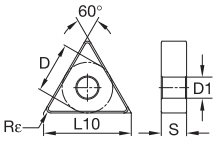
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNGG160404FS	9,53	16,50	4,76	0,4	3,81	-	-	-	-	-	-	-	-	-	-	5548681	5538231	5549998	-	-	-	-	-	-	-
TNGG220408FS	12,70	22,00	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5548682	-	-	-	-	-	-	-	-	-

TNMA • Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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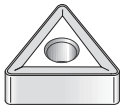
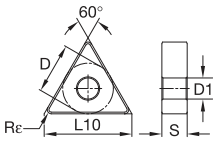
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMA160408	9,53	16,50	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2560136	-	-	-	-
TNMA160408	9,53	16,50	4,76	0,8	3,81	-	-	-	-	-	-	-	4171647	6287930	4171890	-	-	-	-	-	-	-	-	-	-
TNMA160412	9,53	16,50	4,76	1,2	3,81	-	-	-	-	-	-	-	-	6287951	4171891	-	-	-	-	-	-	-	-	-	-
TNMA220408	12,70	22,00	4,76	0,8	5,16	-	-	-	-	-	-	-	4171649	-	4171893	-	-	-	-	-	-	-	-	-	-
TNMA220412	12,70	22,00	4,76	1,2	5,16	-	-	-	-	-	-	-	4172230	-	4171894	-	-	-	-	-	-	-	-	-	-
TNMA220416	12,70	22,00	4,76	1,6	5,16	-	-	-	-	-	-	-	-	-	4171895	-	-	-	-	-	-	-	-	-	-
TNMA270616	15,88	27,50	6,35	1,6	6,35	-	-	-	-	-	-	-	-	-	4171896	-	-	-	-	-	-	-	-	-	-

TNMG • Roughing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
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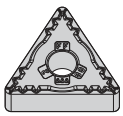
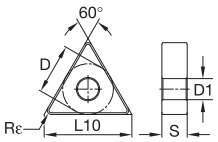
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404	9,53	16,50	4,76	0,4	3,81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2559750	-	-	-	-
TNMG160404	9,53	16,50	4,76	0,4	3,81	-	-	-	-	-	-	-	-	6671911	-	-	-	-	-	-	-	-	-	-	-
TNMG160408	9,53	16,50	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2039543	-	-	-	-
TNMG160408	9,53	16,50	4,76	0,8	3,81	-	-	-	-	-	-	-	-	6617524	-	-	-	-	-	-	-	-	-	-	-
TNMG160412	9,53	16,50	4,76	1,2	3,81	-	-	-	-	-	-	-	-	6671880	-	-	-	-	-	-	-	-	-	-	-

TNMG-FF • Fine Finishing





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
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N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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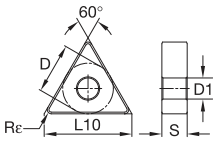
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404FF	9,53	16,50	4,76	0,4	3,81	-	4171050	-	-	-	4172691	-	-	-	4171385	-	-	-	-	-	-	-	-	-	-
TNMG160408FF	9,53	16,50	4,76	0,8	3,81	-	4171051	-	-	-	-	-	-	-	4171386	-	-	-	-	-	-	-	-	-	-
TNMG160412FF	9,53	16,50	4,76	1,2	3,81	-	4171052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMG-ML • Medium Machining



● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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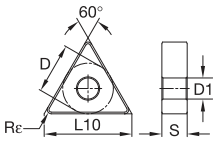
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404ML	9,53	16,50	4,76	0,4	3,81	-	4171075	4170491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160408ML	9,53	16,50	4,76	0,8	3,81	-	4171076	4170492	-	-	-	-	4171672	-	4171410	-	-	-	-	-	-	-	-	-	-
TNMG160412ML	9,53	16,50	4,76	1,2	3,81	-	4171077	4170493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220404ML	12,70	22,00	4,76	0,4	5,16	-	5684348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220408ML	12,70	22,00	4,76	0,8	5,16	-	4171078	4170494	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMG-MR • Medium Roughing



● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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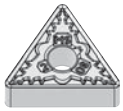
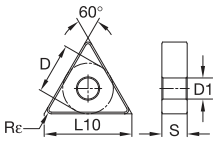
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404MR	9,53	16,50	4,76	0,4	3,81	-	4171150	4170573	4170059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160408MR	9,53	16,50	4,76	0,8	3,81	-	4171151	4170574	4170060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160412MR	9,53	16,50	4,76	1,2	3,81	-	4171152	4170575	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220404MR	12,70	22,00	4,76	0,4	5,16	-	4171153	4170576	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220408MR	12,70	22,00	4,76	0,8	5,16	-	4171154	4170577	4170063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220412MR	12,70	22,00	4,76	1,2	5,16	-	4171155	4170578	4170064	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220416MR	12,70	22,00	4,76	1,6	5,16	-	-	4170579	4170065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMG-MS • Medium Sharp





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●			●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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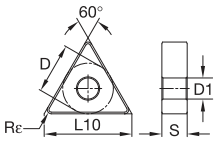
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404MS	9,53	16,50	4,76	0,4	3,81	-	-	-	-	-	-	-	-	-	-	5908927	5908928	5908929	-	-	-	-	-	-	-
TNMG160408MS	9,53	16,50	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	5908930	5908931	5908932	-	-	-	-	-	-	-
TNMG220404MS	12,70	22,00	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5908933	5908934	5908935	-	-	-	-	-	-	-
TNMG220408MS	12,70	22,00	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908936	5908937	5908938	-	-	-	-	-	-	-
TNMG220412MS	12,70	22,00	4,76	1,2	5,16	-	-	-	-	-	-	-	-	-	-	-	5908940	-	-	-	-	-	-	-	-
TNMG270608MS	15,88	27,50	6,35	0,8	6,35	-	-	-	-	-	-	-	-	-	-	-	5908942	5908943	-	-	-	-	-	-	-

TNMG-RH • Roughing

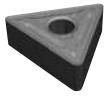


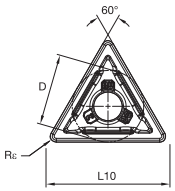
● first choice
○ alternate choice

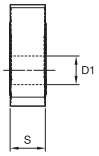
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160408RH	9,53	16,50	4,76	0,8	3,81	-	4171007	4171542	4171724	-	4173058	-	-	6673946	4171927	-	-	-	-	-	-	-	-	-	-
TNMG160412RH	9,53	16,50	4,76	1,2	3,81	-	-	4171543	4171725	-	-	-	-	-	4171928	-	-	-	-	-	-	-	-	-	-
TNMG220408RH	12,70	22,00	4,76	0,8	5,16	-	4171009	4171544	4171726	-	-	-	-	-	4171929	-	-	-	-	-	-	-	-	-	-
TNMG220412RH	12,70	22,00	4,76	1,2	5,16	-	4171010	4171545	4171727	-	-	-	-	-	4171930	-	-	-	-	-	-	-	-	-	-
TNMG220416RH	12,70	22,00	4,76	1,6	5,16	-	-	-	4171728	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270612RH	15,88	27,50	6,35	1,2	6,35	-	-	4171547	4171729	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270616RH	15,88	27,50	6,35	1,6	6,35	-	-	4171548	4171730	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG330924RH	19,05	33,00	9,53	2,4	7,93	-	-	4171549	4171731	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMG-RU • Roughing Universal





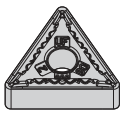


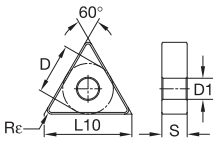
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160408RU	9,53	16,50	4,76	0,8	3,81	-	6776800	6776799	-	6817524	6777051	-	-	6746845	6817450	-	-	-	-	-	-	-	-	-	6795795
TNMG160412RU	9,53	16,50	4,76	1,2	3,81	-	6776936	6776935	-	6817525	6776937	-	-	6746846	6817521	-	-	-	-	-	-	-	-	-	6791846

TNMG-UF • Fine Finishing



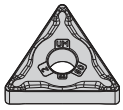


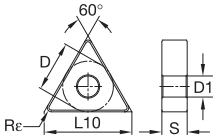
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404UF	9,53	16,50	4,76	0,4	3,81	-	-	-	-	4169367	4169393	-	-	-	-	5432605	-	-	-	-	-	-	-	-	-
TNMG160408UF	9,53	16,50	4,76	0,8	3,81	-	-	-	-	4169368	4169394	-	-	-	-	5432606	-	-	-	-	-	-	-	-	-
TNMG220404UF	12,70	22,00	4,76	0,4	5,16	-	-	-	-	4169370	4169396	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220408UF	12,70	22,00	4,76	0,8	5,16	-	-	-	-	-	4169397	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMG-UM • Medium Machining



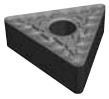


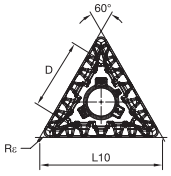
● first choice
○ alternate choice

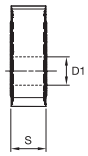
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160404UM	9,53	16,50	4,76	0,4	3,81	-	-	-	-	4172369	4172396	-	-	-	-	5550226	-	-	-	-	-	-	-	-	-
TNMG160408UM	9,53	16,50	4,76	0,8	3,81	-	-	-	-	4172370	4172397	4172427	-	-	-	5550228	-	-	-	-	-	-	-	-	-
TNMG160412UM	9,53	16,50	4,76	1,2	3,81	-	-	-	-	-	4172398	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160416UM	9,53	16,50	4,76	1,6	3,81	-	-	-	-	-	4172399	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220404UM	12,70	22,00	4,76	0,4	5,16	-	-	-	-	-	4172400	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220408UM	12,70	22,00	4,76	0,8	5,16	-	-	-	-	-	4172401	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220412UM	12,70	22,00	4,76	1,2	5,16	-	-	-	-	-	4172402	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMG-UR • Universal Roughing







● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
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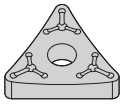
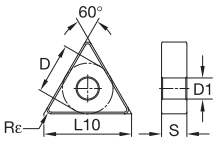
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMG160408UR	9,53	16,50	4,76	0,8	3,81	-	4171115	4170522	4170035	4169434	4169465	-	-	-	4171441	-	5579395	-	-	-	-	-	-	-	-
TNMG160412UR	9,53	16,50	4,76	1,2	3,81	-	4171116	4170523	-	-	4169466	-	-	-	-	-	5680175	-	-	-	-	-	-	6791842	6791845
TNMG160416UR	9,53	16,50	4,76	1,6	3,81	-	4171117	-	-	-	-	-	-	-	4171443	-	-	-	-	-	-	-	-	-	-
TNMG220408UR	12,70	22,00	4,76	0,8	5,16	-	4171118	4170524	4170036	4169435	4169468	4169503	-	-	4171444	-	-	-	-	-	-	-	-	-	-
TNMG220412UR	12,70	22,00	4,76	1,2	5,16	-	-	4170525	-	-	4169469	4169504	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220416UR	12,70	22,00	4,76	1,6	5,16	-	4171120	-	-	-	4169470	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270612UR	15,88	27,50	6,35	1,2	6,35	-	-	4170527	-	-	4169471	4169506	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270616UR	15,88	27,50	6,35	1,6	6,35	-	4171122	4170528	-	-	4169472	4169507	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMM-65 • Heavy Roughing





● first choice
○ alternate choice

P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
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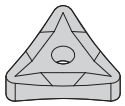
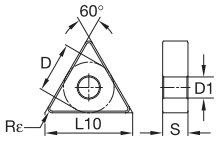
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMM16040865	9,53	16,50	4,76	0,8	3,81	-	-	5696618	5696619	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMM22040865	12,70	22,00	4,76	0,8	5,16	-	5696621	5696622	5696623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMM22041265	12,70	22,00	4,76	1,2	5,16	-	-	5696625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TNMP • Medium Machining





● first choice
○ alternate choice

P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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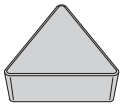
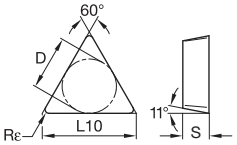
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TNMP160404	9,53	16,50	4,76	0,4	3,81	-	-	-	-	-	4173670	4173709	-	-	-	4172491	-	-	-	-	-	-	-	-	-
TNMP160408	9,53	16,50	4,76	0,8	3,81	-	-	-	-	-	4173671	4173710	-	-	-	4172492	4172623	-	-	-	-	-	-	-	-
TNMP160412	9,53	16,50	4,76	1,2	3,81	-	-	-	-	-	4173672	-	-	-	-	-	4172624	-	-	-	-	-	-	-	-
TNMP220404	12,70	22,00	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	4172494	-	-	-	-	-	-	-	-	-
TNMP220408	12,70	22,00	4,76	0,8	5,16	-	-	-	-	-	4173674	-	-	-	-	4172495	4172625	-	-	-	-	-	-	-	-

TPGN/TPG • Medium Machining





● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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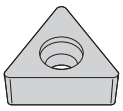
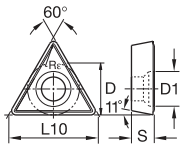
ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TPGN110304	6,35	11,00	3,18	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2015100	-	-	-	-
TPGN110308	6,35	11,00	3,18	0,8	-	-	-	-	-	-	-	-	-	4170952	-	-	-	-	-	-	-	-	-	-
TPGN160308	9,53	16,50	3,18	0,8	-	-	-	-	-	-	-	-	-	4170953	-	-	-	-	-	-	-	-	-	-

TPGA • Medium Machining



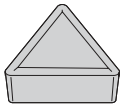


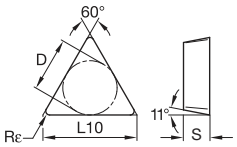
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TPGA110204	6,35	11,00	2,38	0,4	3,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2015081	-	-	-	-
TPGA110208	6,35	11,00	2,38	0,8	3,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2031786	-	-	-	-

TPMR • Medium Machining



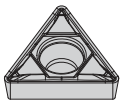


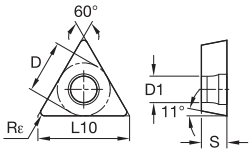
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TPMR110304	6,35	11,00	3,18	0,4	-	4170859	-	4170784	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPMR110308	6,35	11,00	3,18	0,8	-	4170860	-	4170785	-	-	-	-	-	4170954	-	-	-	-	-	-	-	-	-	-
TPMR160304	9,53	16,50	3,18	0,4	-	4170861	-	4170786	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPMR160308	9,53	16,50	3,18	0,8	-	4170862	-	4170787	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPMR160312	9,53	16,50	3,18	1,2	-	4170863	-	4170788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TPMT-FP • Finishing Positive



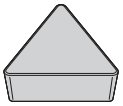


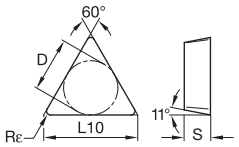
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S						○						●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TPMT110204FP	6,35	11,00	2,38	0,4	2,80	-	-	-	-	-	-	-	-	-	4170113	-	-	-	-	-	-	-	-	-	-
TPMT16T308FP	9,53	16,50	3,97	0,8	4,40	-	-	-	-	-	4168837	-	-	-	4170116	-	-	-	-	-	-	-	-	-	-
TPMT220408FP	12,70	22,00	4,76	0,8	5,50	-	-	4170340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TPUN/TPU • Medium Machining



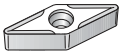


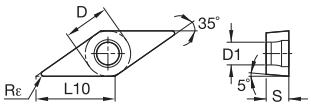
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●			●	●
M					○	●	●	●				●	●		○					●	●	●
K		○	○	○					●	●	●	○	○		○		●				○	○
N												○	○	●	●		○				○	○
S							○					●	●		○		○		○		●	●
H																					○	

ISO catalogue number	D	L10	S	Rε	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
TPUN110304	6,35	11,00	3,18	0,4	-	4170864	-	4170789	-	-	-	-	-	-	-	-	-	-	-	2028806	-	-	-	-
TPUN110308	6,35	11,00	3,18	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028814	-	-	-	-
TPUN160304	9,53	16,50	3,18	0,4	-	4170866	4170645	-	-	-	-	-	-	4170958	-	-	-	-	-	2028821	2562837	-	-	-
TPUN160308	9,53	16,50	3,18	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2562781	-	-	-	-
TPUN160308	9,53	16,50	3,18	0,8	-	4170867	4170646	-	-	-	-	-	-	4170959	-	-	-	-	-	2028830	2028832	-	-	-
TPUN160312	9,53	16,50	3,18	1,2	-	-	-	-	-	-	-	-	-	4170960	-	-	-	-	-	2028833	-	-	-	-
TPUN220408	12,70	22,00	4,76	0,8	-	4170868	-	4170790	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPUN220408	12,70	22,00	4,76	0,8	-	-	4170648	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPUN220412	12,70	22,00	4,76	1,2	-	-	4170649	4170791	-	-	-	-	-	4170961	-	-	-	-	-	2028843	2028847	-	-	-

VBMT • Medium Machining



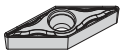


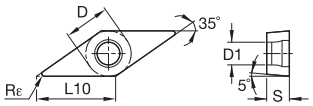
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VBMT160404	9,53	16,66	4,76	0,4	4,45	-	4169983	4170553	4170807	-	-	-	-	-	-	-	-	-	-	-	2028860	-	-	-	-
VBMT160408	9,53	16,61	4,76	0,8	4,40	-	4169984	4170554	4170808	-	-	-	-	6671879	-	-	-	-	-	-	2028870	-	-	-	-
VBMT160412	9,53	16,61	4,76	1,2	4,40	-	4169985	-	-	-	-	-	-	-	-	-	-	-	-	-	2028876	-	-	-	-

VBMT-FP • Finishing Positive



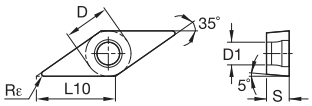


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VBMT110302FP	6,35	11,07	3,18	0,2	2,80	-	-	4170318	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBMT110304FP	6,35	11,07	3,18	0,4	2,80	-	4170012	4170319	-	-	4168807	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBMT110308FP	6,35	11,07	3,18	0,8	2,80	-	-	4170320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBMT160402FP	9,53	16,61	4,76	0,2	4,40	-	-	4170321	-	-	4168809	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBMT160404FP	9,53	16,61	4,76	0,4	4,40	-	4170013	4170322	-	4168776	4168810	-	-	-	4170103	-	-	-	-	-	-	-	-	-	-
VBMT160408FP	9,53	16,61	4,76	0,8	4,40	-	4170014	4170323	-	-	4168811	-	-	-	-	-	-	-	-	-	-	-	-	-	-

VBMT-MP • Medium Positive

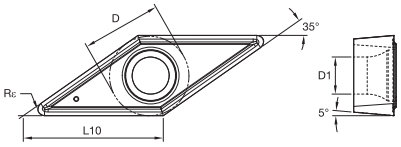


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VBMT160404MP	9,53	16,61	4,76	0,4	4,40	-	-	4170235	-	-	4168921	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBMT160408MP	9,53	16,61	4,76	0,8	4,40	-	-	4170236	-	-	4168922	-	-	-	4170254	-	-	-	-	-	-	-	-	-	-

VBMT-1P • Finishing

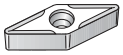


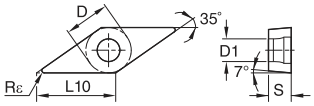
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VBMT1604041P	9,53	16,61	4,76	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6869672	6868867
VBMT1604081P	9,53	16,61	4,76	0,8	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6869673	6868868

VCMT • Medium Machining



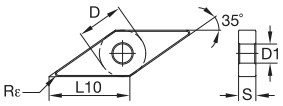


● first choice
○ alternate choice

		WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VCMT16T304	9,53	16,61	3,97	0,4	4,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2563826	-	-	-	-
VCMT16T308	9,53	16,61	3,97	0,8	4,40	-	-	-	-	-	-	-	-	6672411	-	-	-	-	-	-	-	-	-	-	-

VNGG-FS • Finishing Sharp

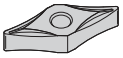


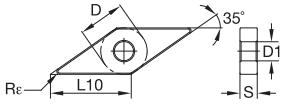
● first choice
○ alternate choice

		WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNGG160401FS	9,53	16,61	4,76	0,1	3,81	-	-	-	-	-	-	-	-	-	-	5548684	-	5550000	-	-	-	-	-	-	-
VNGG160402FS	9,53	16,61	4,76	0,2	3,81	-	-	-	-	-	-	-	-	-	-	5548683	-	5549999	-	-	-	-	-	-	-
VNGG160404FS	9,53	16,61	4,76	0,4	3,81	-	-	-	-	-	-	-	-	-	-	5548685	-	5550001	-	-	-	-	-	-	-
VNGG160408FS	9,53	16,61	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	5548686	5538233	5550002	-	-	-	-	-	-	-

VNGP • Medium Machining



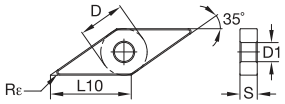


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNGP160401	9,53	16,61	4,76	0,1	3,81	-	-	-	-	-	-	-	-	-	-	5549195	-	5549211	-	-	-	-	-	-	-
VNGP160402	9,53	16,61	4,76	0,2	3,81	-	-	-	-	-	-	-	-	-	-	5549196	-	-	-	-	-	-	-	-	-
VNGP220408	12,70	22,14	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	-	-	5549212	-	-	-	-	-	-	-

VNMA • Roughing

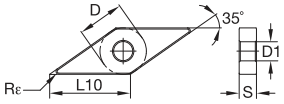


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMA160408	9,53	16,61	4,76	0,8	3,81	-	-	-	-	-	-	-	4171652	-	4171897	-	-	-	-	-	-	-	-	-	-

VNMG • Medium Machining

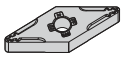


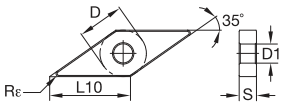
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG12T304	7,14	12,45	3,97	0,4	3,60	-	-	-	-	-	-	-	-	-	-	5095163	5095164	-	-	-	-	-	-	6942277	6867907
VNMG12T308	7,14	12,45	3,97	0,8	3,60	-	-	-	-	-	-	-	-	-	4170965	5095165	5095166	-	-	-	-	-	-	6942278	6867908

VNMG-FF • Fine Finishing



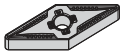


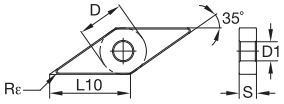
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160404FF	9,53	16,61	4,76	0,4	3,81	-	4171053	-	-	-	4172694	-	-	-	-	5684334	-	-	-	-	-	-	-	-	-
VNMG160408FF	9,53	16,61	4,76	0,8	3,81	-	4171054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

VNMG-ML • Medium Machining



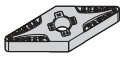


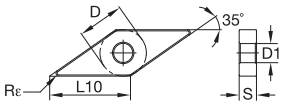
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160404ML	9,53	16,61	4,76	0,4	3,81	-	4171079	4170495	-	-	-	-	-	-	4171413	-	-	-	-	-	-	-	-	-	-
VNMG160408ML	9,53	16,61	4,76	0,8	3,81	-	4171080	4170496	-	-	-	-	-	-	4171414	-	-	-	-	-	-	-	-	-	-

VNMG-MR • Medium Roughing



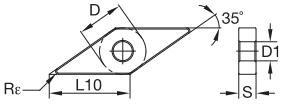


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160408MR	9,53	16,61	4,76	0,8	3,81	-	4171157	4170580	4170066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

VNMG-MS • Medium Sharp

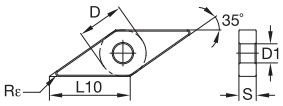


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160404MS	9,53	16,61	4,76	0,4	3,81	-	-	-	-	-	-	-	-	-	-	5908944	5908945	5908946	-	-	-	-	-	-	-
VNMG160408MS	9,53	16,61	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	5908947	5908948	5908949	-	-	-	-	-	-	-
VNMG220404MS	12,70	22,14	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5908950	5908961	5908962	-	-	-	-	-	-	-
VNMG220408MS	12,70	22,14	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908963	5908964	5908965	-	-	-	-	-	-	-

VNMG-RH • Roughing

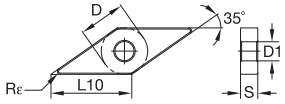


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160408RH	9,53	16,61	4,76	0,8	3,81	-	-	4171550	4171732	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNMG220408RH	12,70	22,14	4,76	0,8	5,16	-	-	4171551	4171733	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNMG220412RH	12,70	22,14	4,76	1,2	5,16	-	4171017	4171552	4171734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

VNMG-UF • Fine Finishing

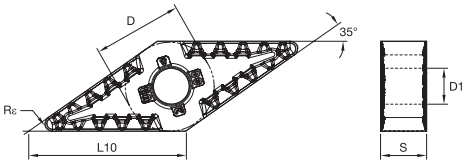


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160404UF	9,53	16,61	4,76	0,4	3,81	-	-	-	-	4169372	4169398	-	-	-	-	5645616	-	-	-	-	-	-	-	-	-
VNMG160408UF	9,53	16,61	4,76	0,8	3,81	-	5645618	-	-	4169373	4169399	-	-	-	-	-	-	-	-	-	-	-	-	-	-

VNMG-UR • Universal Roughing



● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
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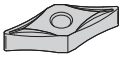
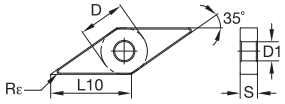
ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMG160408UR	9,53	16,61	4,76	0,8	3,81	-	4171123	4170529	-	4169439	4169473	4169508	-	-	4171449	-	-	-	-	-	-	-	-	6942349	6867893
VNMG160412UR	9,53	16,61	4,76	1,2	3,81	-	4171124	4170530	-	-	4169474	-	-	-	4171450	5680176	-	-	-	-	-	-	-	6942350	6867894

VNMP • Medium Machining



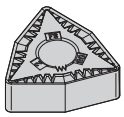


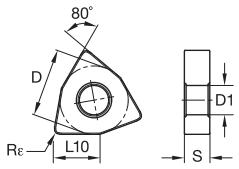
● first choice
○ alternate choice

		WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
VNMP160404	9,53	16,61	4,76	0,4	3,81	'	'	'	'	'	'	'	'	'	'	4172497	'	'	'	'	'	'	'	'	'
VNMP160408	9,53	16,61	4,76	0,8	3,81	'	'	'	'	'	'	'	'	'	'	4172498	'	'	'	'	'	'	'	'	'

WNGG-FS • Finishing Sharp



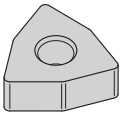


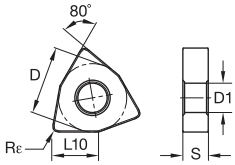
● first choice
○ alternate choice

		WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNGG080404FS	12,70	8,69	4,76	0,4	5,16	'	'	'	'	'	'	'	'	'	'	5548687	5538234	5550003	'	'	'	'	'	'	'
WNGG080408FS	12,70	8,69	4,76	0,8	5,16	'	'	'	'	'	'	'	'	'	'	5548688	'	5550004	'	'	'	'	'	'	'

WNMA • Roughing



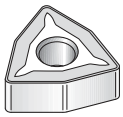


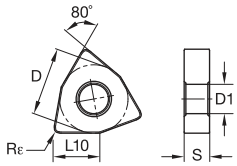
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMA060408	9,53	6,52	4,76	0,8	3,81	-	-	-	-	-	-	-	4171653	-	4171898	-	-	-	-	-	-	-	-	-	-
WNMA060412	9,53	6,52	4,76	1,2	3,81	-	-	-	-	-	-	-	-	-	4171899	-	-	-	-	-	-	-	-	-	-
WNMA080408	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	-	-	4171654	6288267	4171900	-	-	-	-	-	-	-	-	-	-
WNMA080412	12,70	8,69	4,76	1,2	5,16	-	-	-	-	-	-	-	4171655	6288268	4171901	-	-	-	-	-	-	-	-	-	-
WNMA080416	12,70	8,69	4,76	0,6	5,16	-	-	-	-	-	-	-	-	-	4171902	-	-	-	-	-	-	-	-	-	-

WNMG-5 • Roughing



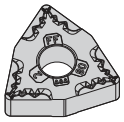


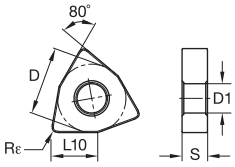
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG080408-5	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	-	-	-	6613603	-	-	-	-	-	-	-	-	-	-	-

WNMG-FF • Fine Finishing



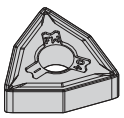


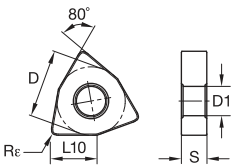
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060404FF	9,53	6,52	4,76	0,4	3,81	-	4171055	-	-	-	-	-	-	-	4171388	-	-	-	-	-	-	-	-	-	-
WNMG060408FF	9,53	6,52	4,76	0,8	3,81	-	4171056	-	-	-	-	-	-	-	4171389	-	-	-	-	-	-	-	-	-	-
WNMG080404FF	12,70	8,69	4,76	0,4	5,16	-	4171057	-	-	-	4172697	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408FF	12,70	8,69	4,76	0,8	5,16	-	4171058	-	-	-	4172698	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WNMG-FW • Finishing Wiper



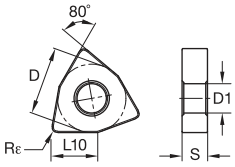


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060408FW	9,53	6,52	4,76	0,8	3,81	-	5623511	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408FW	12,70	8,69	4,76	0,8	5,16	-	5623515	-	-	-	4173110	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WNMG-ML • Medium Machining

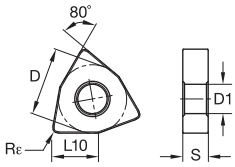


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060404ML	9,53	6,52	4,76	0,4	3,81	-	4171081	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060408ML	9,53	6,52	4,76	0,8	3,81	-	4171082	4170497	-	-	-	-	4171677	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080404ML	12,70	8,69	4,76	0,4	5,16	-	4171083	4170498	-	-	-	-	4171678	-	4171417	-	-	-	-	-	-	-	-	-	-
WNMG080408ML	12,70	8,69	4,76	0,8	5,16	-	4171084	4170499	-	-	-	-	4171679	-	4171418	-	-	-	-	-	-	-	-	-	-

WNMG-MR • Medium Roughing

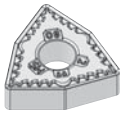


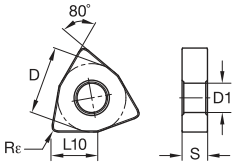
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG080408MR	12,70	8,69	4,76	0,8	5,16	-	4171158	4170581	4170067	-	4173033	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412MR	12,70	8,69	4,76	1,2	5,16	-	4171159	4170582	4170068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080416MR	12,70	8,69	4,76	1,6	5,16	-	4171160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WNMG-MS • Medium Sharp



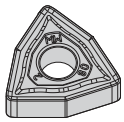


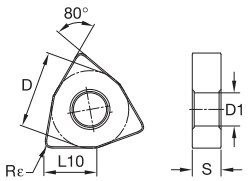
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060408MS	9,53	6,52	4,76	0,8	3,81	-	-	-	-	-	-	-	-	-	-	5908966	5908967	5908968	-	-	-	-	-	-	-
WNMG080404MS	12,70	8,69	4,76	0,4	5,16	-	-	-	-	-	-	-	-	-	-	5908969	5908970	5908971	-	-	-	-	-	-	-
WNMG080408MS	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	5908972	5908973	5908974	-	-	-	-	-	-	-

WNMG-MW • Medium Wiper



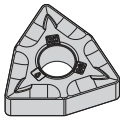


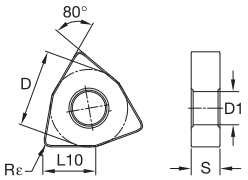
● first choice
○ alternate choice

P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG080408MW	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	4173118	-	4171695	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412MW	12,70	8,69	4,76	1,2	5,16	-	-	-	-	-	4173119	-	4171697	-	-	-	-	-	-	-	-	-	-	-	-

WNMG-RH • Roughing



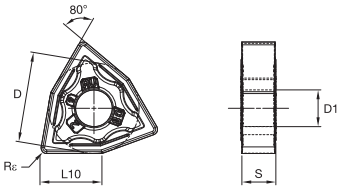


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060408RH	9,53	6,52	4,76	0,8	3,81	-	4171018	4171553	-	-	-	-	-	6673948	-	-	-	-	-	-	-	-	-	-	-
WNMG080408RH	12,70	8,69	4,76	0,8	5,16	-	4171019	4171554	4171736	-	4173064	-	-	6290495	4171932	-	-	-	-	-	-	-	-	-	-
WNMG080412RH	12,70	8,69	4,76	1,2	5,16	-	4171020	4171555	4171737	-	4173065	-	-	6288269	4171933	-	-	-	-	-	-	-	-	-	-
WNMG080416RH	12,70	8,69	4,76	1,6	5,16	-	-	4171556	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WNMG-RU • Roughing Universal

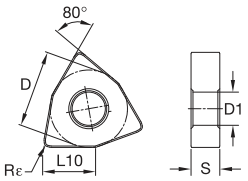


● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG080408RU	12,70	8,69	4,76	0,8	5,16	-	6696886	6696887	-	6711599	6817758	-	-	6696885	6583558	-	-	-	-	-	-	-	-	-	6819328
WNMG080412RU	12,70	8,69	4,76	1,2	5,16	-	6690252	6690249	-	6817526	6817759	-	-	6678405	6690255	-	-	-	-	-	-	-	-	-	6819329

WNMG-UF • Fine Finishing

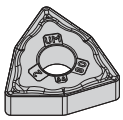


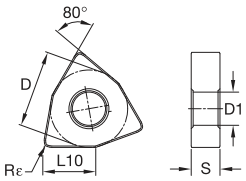
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060404UF	9,53	6,52	4,76	0,4	3,81	-	-	-	-	4169374	4169400	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060408UF	9,53	6,52	4,76	0,8	3,81	-	-	-	-	-	4169401	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080404UF	12,70	8,69	4,76	0,4	5,16	-	-	-	-	4169376	4169402	-	-	-	-	5645619	-	-	-	-	-	-	-	-	-
WNMG080408UF	12,70	8,69	4,76	0,8	5,16	-	-	-	-	4169377	4169403	-	-	-	-	5645623	-	-	-	-	-	-	-	-	-
WNMG080412UF	12,70	8,69	4,76	1,2	5,16	-	-	-	-	4169378	4169404	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WNMG-UM • Medium Machining



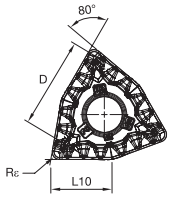


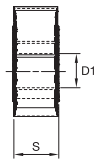
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060404UM	9,53	6,52	4,76	0,4	3,81	-	-	-	-	4172375	4172403	4172432	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060408UM	9,53	6,52	4,76	0,8	3,81	-	-	-	-	4172376	4172404	4172433	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060412UM	9,53	6,52	4,76	1,2	3,81	-	-	-	-	-	4172405	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080404UM	12,70	8,69	4,76	0,4	5,16	-	-	-	-	4172377	4172406	4172435	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408UM	12,70	8,69	4,76	0,8	5,16	6496991	-	5645270	-	4172378	4172407	4172436	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412UM	12,70	8,69	4,76	1,2	5,16	6496992	-	-	-	-	4172408	-	-	-	-	5645269	-	-	-	-	-	-	-	-	-

WNMG-UR • Universal Roughing



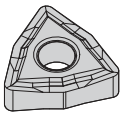


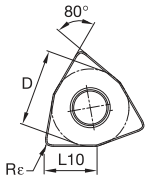
● first choice
○ alternate choice

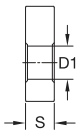
	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMG060408UR	9,53	6,52	4,76	0,8	3,81	-	4171125	4170531	-	4169441	4169475	-	-	-	4171451	5680178	-	-	-	-	-	-	-	6942361	6867895
WNMG060412UR	9,53	6,52	4,76	1,2	3,81	-	4171126	4170532	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408UR	12,70	8,69	4,76	0,8	5,16	-	4171127	4170533	4170040	4169442	4169476	4169509	5680179	-	4171453	-	-	-	-	-	-	-	-	6942362	6867896
WNMG080412UR	12,70	8,69	4,76	1,2	5,16	-	4171128	4170534	4170041	-	4169477	4169510	-	-	4171454	5579420	-	-	-	-	-	-	-	6942363	6867897
WNMG080416UR	12,70	8,69	4,76	1,6	5,16	-	-	-	-	-	4169478	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WNMP • Medium Machining





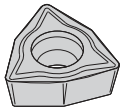


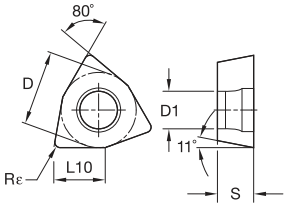
● first choice
○ alternate choice

	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
P	●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M				○	●	●	●				●	●		○				●	●	●
K	○	○	○					●	●	●	○	○		○		●			○	○
N											○	○	●	●		○			○	○
S						○					●	●		○		○		○	●	●
H																			○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WNMP080408	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	-	-	-	-	-	4172499	-	-	-	-	-	-	-	-	-

WPMT-FP • Finishing Positive





● first choice
○ alternate choice

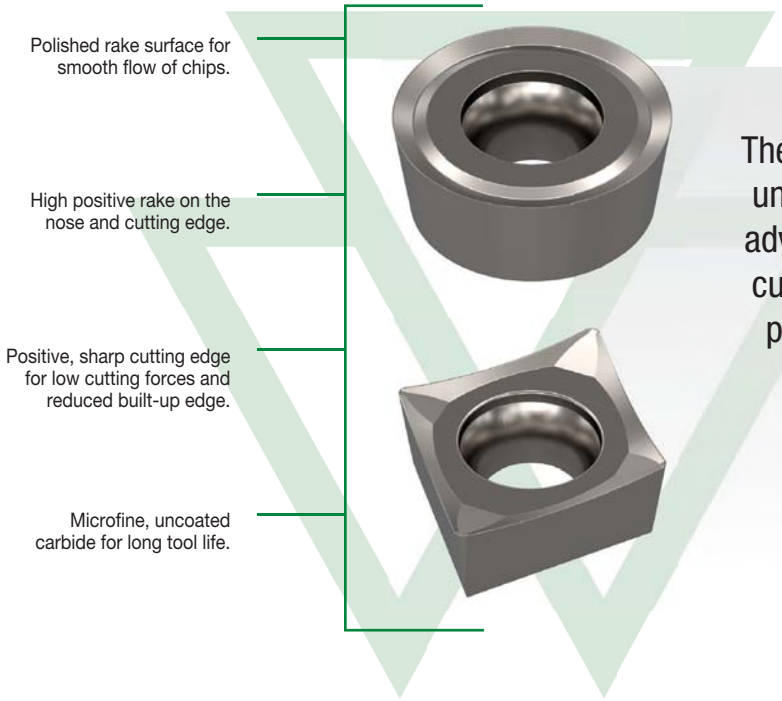
P		●	●	●	●	○	○	○	○	○	○	○	○		○	●		●		●	●
M					○	●	●	●				●	●		○				●	●	●
K		○	○	○					●	●	●	○	○		○		●			○	○
N												○	○	●	●		○			○	○
S							○					●	●		○		○		○	●	●
H																				○	

ISO catalogue number	D	L10	S	Rε	D1	WP05CT	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK15CT	WK20CT	WS10PT	WS25PT	WU10HT	WU05PT	WP20TT	THM	TTR	WM20CT	WU10PT	WU25PT
WPMT06T308FP	9,53	6,52	3,97	0,8	4,40	-	-	4170342	-	-	4168840	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Inserts for Aluminum

-AL Geometry

The AL geometry ISO turning series offers various grades and popular styles, giving customers more versatility and optionality when machining aluminum and non-ferrous metal materials in medium to finish turning applications.



The AL geometry inserts are available in uncoated microfine carbide, as well as advanced ALTiN PVD coating with sharp cutting edges, polished rake faces and positive rakes to enable short set-up times and extend the tool life.

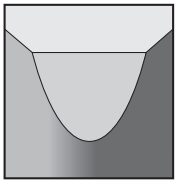
INSERTS FOR ALUMINUM

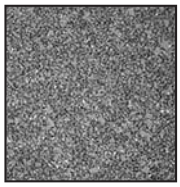
VERSATILE **RELIABLE** **AFFORDABLE**

MEDIUM TO FINISHING ALUMINUM TURNING

WU10HT/WU05PT • GRADE INFORMATION

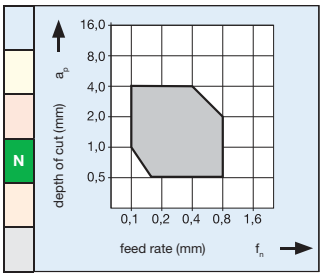
A hard, unalloyed, low-binder content with fine-grained carbide. It is a wear-resistant, uncoated carbide for machining of aluminum and other non-ferrous materials.





WU10HT/WU05PT

	Geometry
Conditions	**AL**
Lightly Interrupted Cut	WU10HT/WU05PT
Varying Depth of Cut	WU10HT/WU05PT
Smooth Cut	WU10HT/WU05PT



For cost-effective machining of aluminum, non-ferrous metals, and plastics. Extremely sharp cutting edges result in optimum part finishes with low cutting forces and short chips.

APPLICATIONS

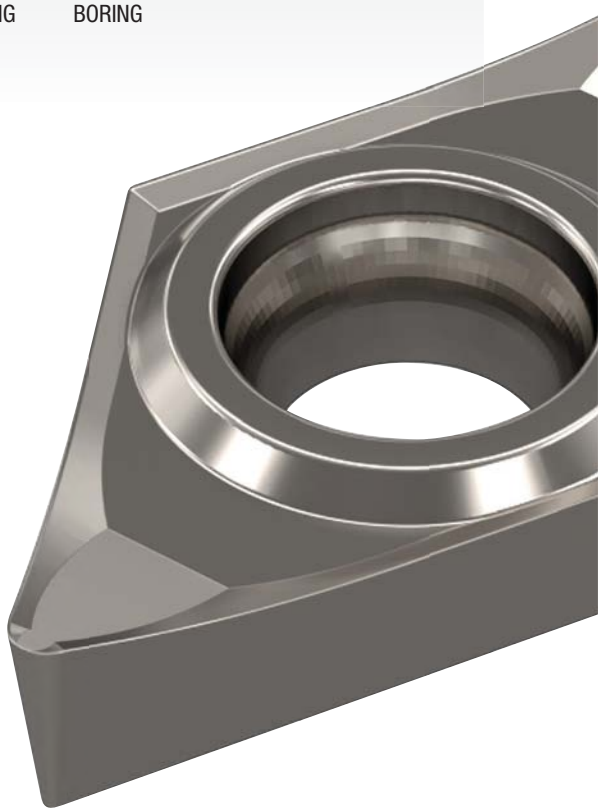
TURNING FACING PROFILING CHAMFERING BORING

INDUSTRY

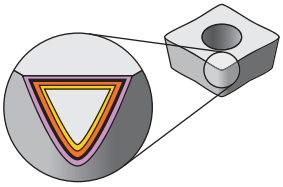
GENERAL ENGINEERING

AEROSPACE

TRANSPORTATION



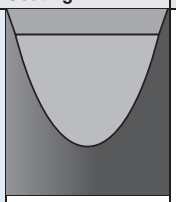
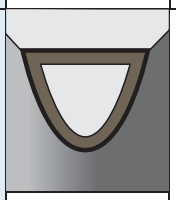
Grades and Grade Descriptions



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ⟷ toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
WU10HT	 HW-N10	Uncoated carbide. Highly wear-resistant microfine substrate. Suitable for finish turning applications in aluminum and all types of non-ferrous materials, stainless steel, and high-temp alloys with suitable edge preparation. Mainly applied in continuous cuts.	M									
			N									
			S									
WU05PT	 HC-N05	Coated carbide. PVD AlTiN-coated grade with microfine substrate and highly wear-resistant coating. Suitable for finish turning in aluminum and other non-ferrous materials and also steels, stainless steel, and high-temp alloys with reliability in continuous cuts with suitable edge preparation.	P									
			M									
			K									
			N									
			S									

Cutting Speed Recommendation • N • Metric

Low-Silicon Aluminum Alloys (hypoeutectic <12.2% Si) and Magnesium Alloys

Speed — m/min

material group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2500	Starting Conditions m/min
N1	WU10HT											488

Low-Silicon Aluminum Alloys (hypoeutectic <12,2% Si) and Magnesium Alloys

Speed — m/min

material group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2250	Starting Conditions m/min
N2	WU10HT											488

High-Silicon Aluminum Alloys (hypereutectic >12,2% Si) and Magnesium Alloys

Speed — m/min

material group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2500	Starting Conditions m/min
N3	WU10HT											488
	WU05PT											550

Copper-, Brass-, Zinc-Based on a Machinability Index Range of 70–100

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N4	WU10HT					259
	WU05PT					275

Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass, and Glass

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N5	WU10HT					170
	WU05PT					170

Carbon and Graphite Composites: Brush Alloys, Kevlar, and Graphite (280–400 HB) (30–43 HRC)

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N6	WU05PT					200

MMCs (Aluminum-Based Metal Matrix Composites)

Speed — m/min

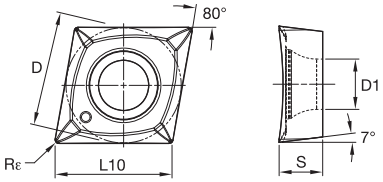
material group	grade	250	500	750	1000	Starting Conditions m/min
N7	WU10HT					180

Tin Alloys, Cast: ASTM 823, Alloys 1, 2, 3, 11

Speed — m/min

material group	grade	250	500	750	1000	Starting Conditions m/min
N8	WU05PT					215

CCGT-AL • Inserts for Aluminum

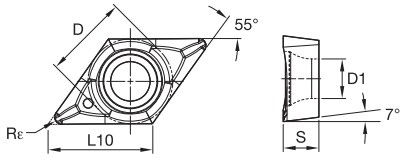


● first choice
○ alternate choice

P			○
M			○
K			○
N		●	●
S		○	○
H			

ISO catalogue number	D	L10	S	Rε	D1	WU10HT	WU05PT
CCGT060202AL	6,35	6,45	2,38	0,2	2,80	6846528	-
CCGT060204AL	6,35	6,47	2,38	0,4	2,79	6846529	6968709
CCGT060208AL	6,35	6,45	2,38	0,8	2,80	6846530	6968710
CCGT09T302AL	9,53	9,67	3,97	0,2	4,40	6846581	-
CCGT09T304AL	9,53	9,67	3,97	0,4	4,40	6846582	6968751
CCGT09T308AL	9,53	9,67	3,97	0,8	4,40	6846583	6968752
CCGT120402AL	12,70	12,90	4,76	0,2	5,50	6846584	-
CCGT120404AL	12,70	12,90	4,76	0,4	5,50	6846585	6968753
CCGT120408AL	12,70	12,90	4,76	0,8	5,50	6846586	6968754

DCGT-AL • Inserts for Aluminum

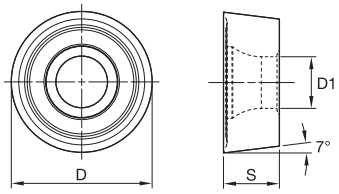


● first choice
○ alternate choice

P				○
M				○
K				○
N			●	●
S			○	○
H				

ISO catalogue number	D	L10	S	Rε	D1	WU10HT	WU05PT
DCGT070202AL	6,35	7,75	2,38	0,2	2,90	6846587	-
DCGT070204AL	6,35	7,75	2,38	0,4	2,90	6846588	6968755
DCGT11T302AL	9,53	11,63	3,97	0,2	4,40	6846589	-
DCGT11T304AL	9,53	11,59	3,97	0,4	4,40	6846590	6968756
DCGT11T308AL	9,53	11,63	3,97	0,8	4,40	6846591	6968757

RCGT-AL • Inserts for Aluminum

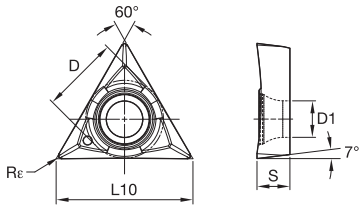


● first choice
○ alternate choice

P				○
M				○
K				○
N			●	●
S			○	○
H				

ISO catalogue number	D	S	D1	WU10HT	WU05PT
RCGT0803M0AL	8,00	3,18	3,40	-	6968758
RCGT1204M0AL	12,00	4,76	4,40	6846592	-

TCGT-AL • Inserts for Aluminum

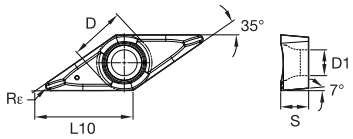


● first choice
○ alternate choice

P			○
M			○
K			○
N		●	●
S		○	○
H			

ISO catalogue number	D	L10	S	Rε	D1	WU10HT	WU05PT
TCGT110204AL	6,35	11,00	2,38	0,4	2,80	6846593	6968759
TCGT16T304AL	9,53	16,51	3,97	0,4	4,40	6846594	6968760
TCGT16T308AL	9,53	16,50	3,97	0,8	4,40	6846595	6968761

VCGT-AL • Inserts for Aluminum

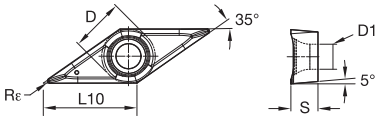


● first choice
○ alternate choice

P			○
M			○
K			○
N		●	●
S		○	○
H			

ISO catalogue number	D	L10	S	Rε	D1	WU10HT	WU05PT
VCGT160404AL	9,53	16,61	4,76	0,4	4,40	–	6968762
VCGT160408AL	9,53	16,61	4,76	0,8	4,40	–	6968763

VBGT-AL • Inserts for Aluminum



● first choice
○ alternate choice

P		○
M		○
K		○
N	●	●
S	○	○
H		

ISO catalogue number	D	L10	S	Rε	D1	WU10HT	WU05PT
VBGT160404AL	9,53	16,61	4,76	0,4	4,40	6846596	-
VBGT160408AL	9,53	16,46	4,76	0,8	4,40	6846597	-

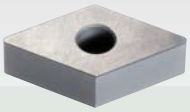
Advanced Material Inserts

Ceramic, PcBN, PCD Inserts

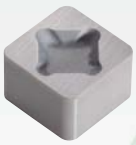
Hard part turning, along with the machining of cast irons, high-temp alloys, and non-ferrous materials, can be accomplished through the use of inserts made from advanced materials. These advanced materials include ceramics, PcBN (polycrystalline cubic boron nitride), and PCD (polycrystalline diamond).

ADVANCED MATERIAL INSERT COMPOSITION

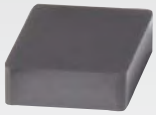
CERAMIC INSERTS



- Silicon-nitride based ceramic for cast iron machining.
- Mixed ceramic for hard machining and finishing of cast iron.
- Whisker ceramic for high-temp alloy and hard part turning.



PCBN SOLID INSERTS



- Inserts are made only from PcBN.
- No material joint.
- Best heat-absorption capacity.
- Can work at highest temperatures.
- Inserts suitable for hard part turning with interruptions.

PcBN TIPPED INSERTS

- Require a carrier and a PcBN tip.
- The tips are brazed to a carrier.
- The substrate has to have a pocket that will accommodate and support the tip.
- Inserts are available in Multi Tip.
- Inserts suitable for hard part turning in continuous and interrupted applications.

PCD INSERTS

- Targeted machining of non-ferrous materials.
- Significant advantage in hardness over carbide tools.
- Increased productivity through higher speeds and longer tool life.
- Best used in processing materials that are un-machinable with conventional tooling.

ADVANCED MATERIAL INSERTS

MATERIALS

K H

CERAMIC

- Ceramics offer greater wear resistance and toughness.
- Ceramics can be used in high-speed, continuous, and lightly interrupted turning applications in cast iron materials.
- Ceramics can be used for high-speed applications in high-temp alloys.
- Ceramics can also be used for hard part turning.

MATERIALS

H

PCBN

- PVD-coated grades available.
- Complete range of CBN grades for continuous to heavily interrupted turning.
- Industry-leading grades for gray cast iron machining.
- Full line of grades for hard part turning.
- For best performance: solid, full-top, and tipped inserts are available.

MATERIALS

N

PCD

- Two PCD grades — WDN25U and WDN00U — cover a wide range of applications.
- New grades provide outstanding performance to increase productivity and cut manufacturing costs.
- High abrasion and chipping resistance.
- Used in machining aluminum alloys with low- and high-silicon content, copper alloys, ceramics, and plastics.
- Suitable for machining highly abrasive materials such as titanium and Metal Matrix Composites (MMC).

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

ENERGY

AEROSPACE

MEDICAL

Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

C — Insert Shape

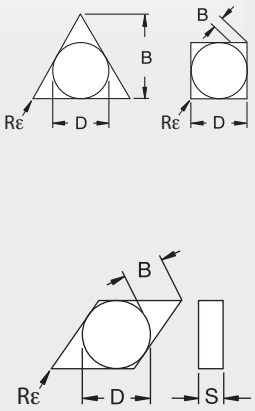
H	Hexagon 120°
O	Octagon 135°
P	Pentagon 108°
R	Round —
S	Square 90°
T	Triangular 60°
C D E M V	Rhomboid 80° 55° 75° 86° 35°
W	Trigon 80° with enlarged corner angles
L	Rectangular 90°
A B N/K	Parallelogram 85° 82° 55°

C — Insert Clearance Angle

A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	For other clearance angles requiring descriptions.

G — Tolerance Class

Tolerances apply prior to edge prep and coating



D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

W — Insert Features

N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X V	Special Design

2 — Size

"D" mm	Code for metric cutting edge length "L10" C	D	R	S	T	V	W
3,97	S4	04	03	03	06	—	—
4,76	04	05	04	04	08	08	S3
5,56	05	06	05	05	09	09	03
6,00	—	—	06	—	—	—	—
6,35	06	07	06	06	11	11	04
7,94	08	09	07	07	13	13	05
8,00	—	—	08	—	—	—	—
9,52	09	11	09	09	16	16	06
10,00	—	—	10	—	—	—	—
11,11	11	13	11	11	19	19	07
12,00	—	—	12	—	—	—	—
12,70	12	15	12	12	22	22	08
14,29	14	17	14	14	24	24	09
15,88	16	19	15	15	27	27	10
16,00	—	—	16	—	—	—	—
17,46	17	21	17	17	30	30	11
19,05	19	23	19	19	33	33	13
20,00	—	—	20	—	—	—	—
22,22	22	27	22	22	38	38	15
25,00	—	—	25	—	—	—	—
25,40	25	31	25	25	44	44	17
31,75	32	38	31	31	54	54	21
32,00	—	—	32	—	—	—	—

tolerance class*	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	See tables on next page		±0,013
U	See tables on next page		±0,013

**Tolerances apply prior to edge prep and coating.*

Catalog Numbering System

(continued)

15 — Thickness "S"

symbol mm	thickness mm
—	0,79
T0	1,00
01	11,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
09	9,52
11	11,11
12	12,70

05 — Corner Radius "Rε"

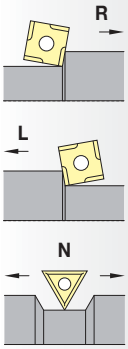
symbol mm	corner radius mm
X0	.04
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	round insert
M0	

Hand of Insert (optional)

R = Right hand

L = Left hand

N = Neutral



E — Cutting Edge (optional)

F* Sharp

E Rounded

T* Chamfered

S* Chamfered and Rounded

K Double-Chamfered

P Double-Chamfered and Rounded

**Also available in wiper style.*

T-Land Width (optional)

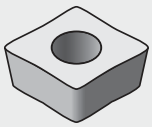
symbol ISO	mm size
010	0,01
020	0,02

T-Land Angle (optional)

symbol	size
10	10°
15	15°
20	20°
25	25°
30	30°

C — Tip Style (optional)

symbol	usage
C	full top
M	mini tip
MT	multi-tip
ST	single tip



Chipbreaker (optional)

FW = Finishing Wiper

MW = Medium Wiper

"D" mm	± Tolerance on "D" — Class M Tolerance: Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Class U Tolerance: Shapes S, T, & C mm
3,97	0,05	–	–	–
4,76	0,05	–	–	0,08
5,56	0,05	0,05	0,05	0,08
6,35	0,05	0,05	0,05	0,08
7,94	0,05	0,05	0,05	0,08
9,52	0,05	0,05	0,05	0,08
11,11	0,08	0,08	0,08	0,13
12,70	0,08	0,08	0,08	0,13
14,29	0,08	0,08	0,08	0,13
15,88	0,10	0,10	0,10	0,18
17,46	0,10	0,10	0,10	0,18
19,05	0,10	0,10	0,10	0,18
22,22	0,13	–	–	0,25
25,40	0,13	–	–	0,25
31,75	0,15	–	–	0,25

"D" mm	± Tolerance on "B" — Class M Tolerance: Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Class U Tolerance: Shapes S, T, & C mm
3,97	0,08	–	–	–
4,76	0,08	–	–	0,13
5,56	0,08	0,11	–	0,13
6,35	0,08	0,11	–	0,13
7,94	0,08	0,11	–	0,13
9,52	0,08	0,11	0,18	0,13
11,11	0,13	0,15	–	–
12,70	0,13	0,15	0,25	0,20
14,29	0,13	0,15	–	–
15,88	0,15	0,18	–	0,27
17,46	0,15	0,18	–	0,27
19,05	0,15	0,18	–	0,27
22,22	0,15	–	–	0,38
25,40	0,18	–	–	0,38
31,75	0,20	–	–	0,38

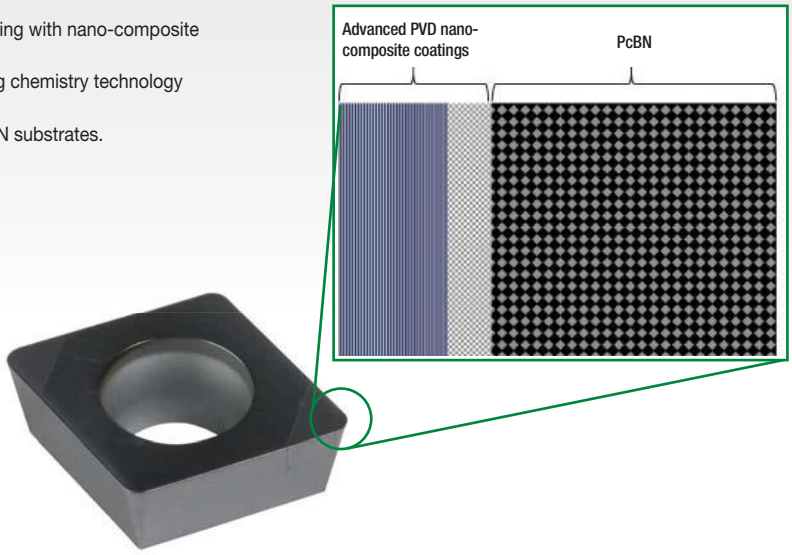
WBH20P™ for Enhanced Performance — Five Unique Features

1 Newly developed substrate enables application in a wide variety of demanding situations.

The substrate contains super-hard grains with a uniquely formulated size distribution and nano-structured binder phase. This unique combination provides an unparalleled balance of wear resistance and toughness. The net result is a robust hard turning tooling solution for a wide range of applications, including continuous to interrupted cutting.

2 Nano-composite coating that enhances speed capabilities and tool life.

- Specially developed, advanced PVD coating with nano-composite architecture for improved performance.
- Improved wear resistance by PVD coating chemistry technology for machining hardened steels.
- Enhanced PVD coating adhesion on PcBN substrates.



3 Improved edge preparation technology for longer tool life, reliable performance, better surface finish, and tighter workpiece tolerances.

A critical performance factor is the edge preparation itself. The grind direction, surface roughness, hone sizes, and tolerances have great impact on performance and process reliability. WIDIA™ has performed significant research work and optimized edge preparation to improve your overall machining effectiveness.

WBH20P™ for Enhanced Performance — Five Unique Features

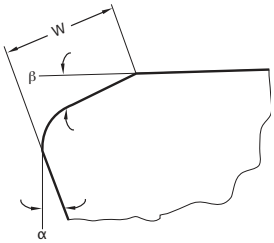
(continued)

4 Large standard portfolio.

Standard edge preparation — the optimum combination of T-land angle, T-land width, and hone size — is paramount in achieving maximum performance. WIDIA™ has developed three standard edge configurations, including wiper inserts.

- Light machining edge prep E.
- Medium machining edge prep S01015.
- Heavy machining edge prep S01025.

E: Honed cutting edge
S01015: W x ß = 0,10mm x 15°
S01025: W x ß = 0,10mm x 25°



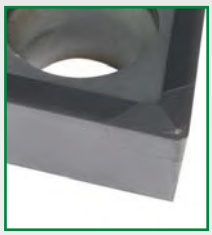
β —T-Land Angle

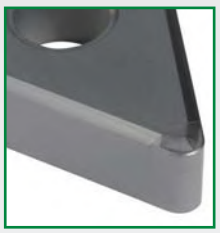
These edge preps are available in common styles, sizes, and nose radii in both positive and negative geometries.

5 CB1 chipbreaker in positive and negative geometries, solving chipbreaking and chip control issues.

Chipbreaker — when machining case-hardened steel with a hard outer skin and a tough and softer core, a chipbreaker provides a great advantage. The CB1 chipbreaker is a proven solution to effectively breaking chips. Long chips can form bird nests, causing machine malfunctions, increasing scrap-rates, and reducing the overall equipment effectiveness.

Available as a custom solution product.

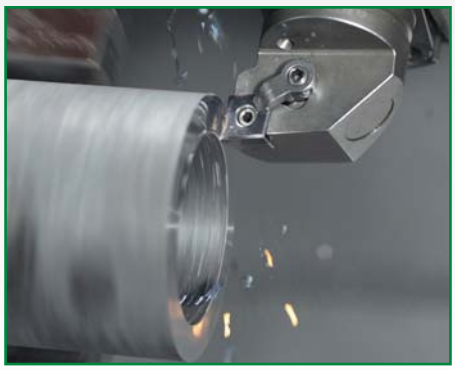




Insert without Chipbreaker

- Long chips.
- Bird-nest formation.

Insert with Chipbreaker



- Chips are broken.

Grade Numbering System — Ceramics

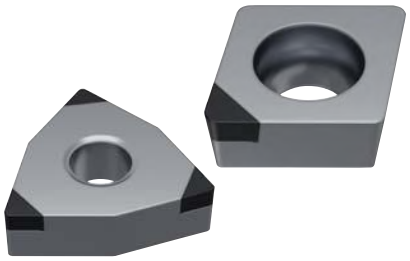
CW	2	0	15
Brand	Cutting Material Group		Application Range
CW = WIDIA™	**2** = CM Mixed (black) ceramic **3** = CR Whisker reinforced ceramic **5** = CN Silicon-nitride ceramic	**0** = Stationary cutting edges (turning, parting, threading) **1** = First successor **2** = Semi-standard rotating cutting edges **3** = Semi-standard general applications **5** = Rotating cutting edges (milling, drilling, reaming)	**05** = fine finishing **10** = finishing **15** = medium to roughing **20** = medium to roughing **25** = medium to roughing **30** = roughing **35** = roughing **40** = heaviest roughing **45** = heaviest roughing **50** = heaviest roughing

Grade Numbering System — PcBN and PCD

W	B	H	30	P
Brand	Cutting Material Group	Material Range	Application Range	Coating
WIDIA™	B = CBN D = PCD	H = hardened materials N = non-ferrous materials		U = Uncoated C = CVD Coated P = PVD Coated

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials
U	Universal Machining

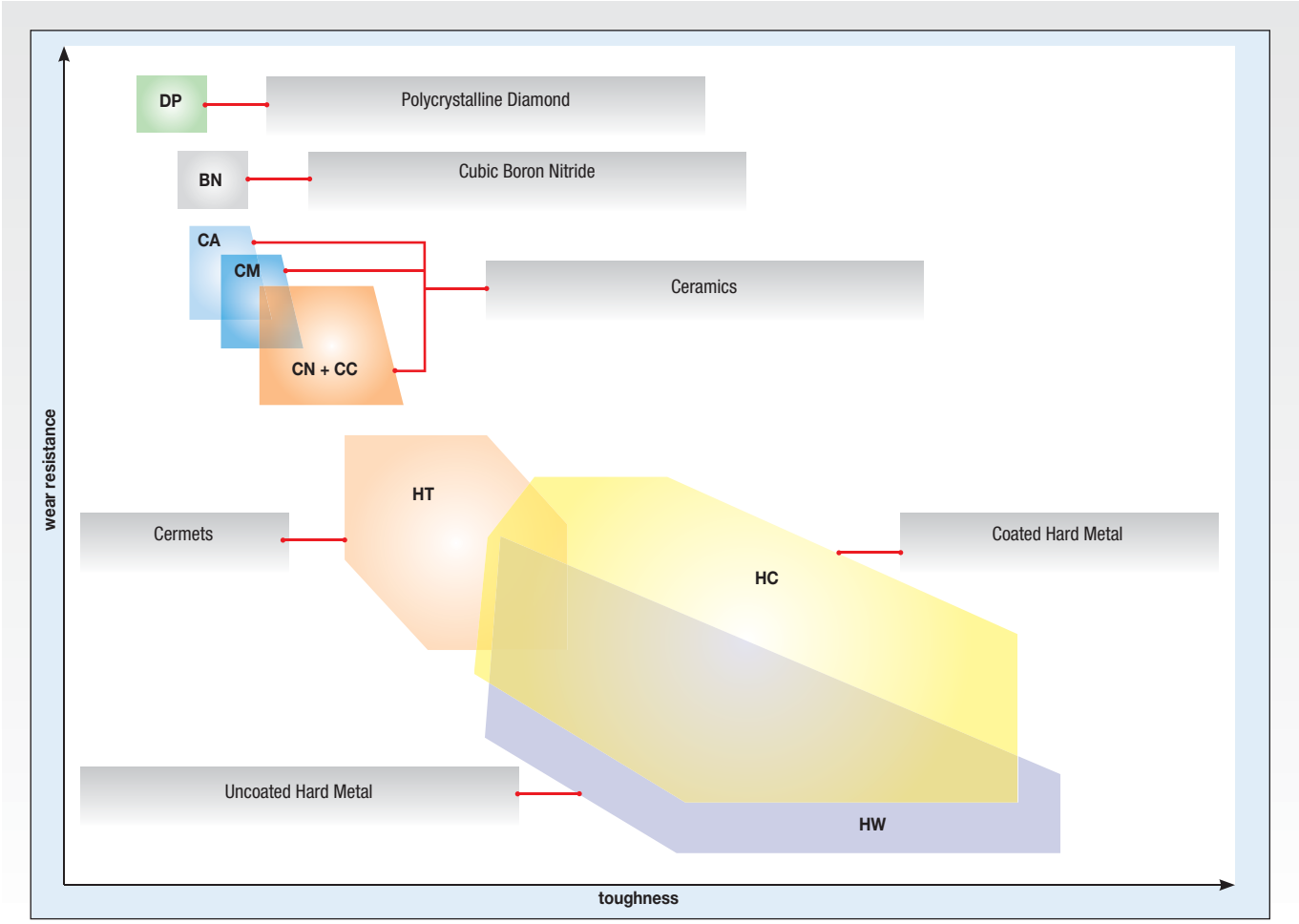
05	=	fine finishing
10	=	finishing
15	=	medium to roughing
20	=	
25	=	
30	=	roughing
35	=	
40	=	heaviest roughing
45	=	
50	=	



Cutting Material Groups

The cutting tool materials are classified by the combination of their hardness and wear-resistance characteristics.

The extended standard DIN ISO 513 also includes ceramic cutting materials and the super-hard polycrystalline materials, boron nitride and diamond, resulting in additional identification symbols for these cutting material groups.

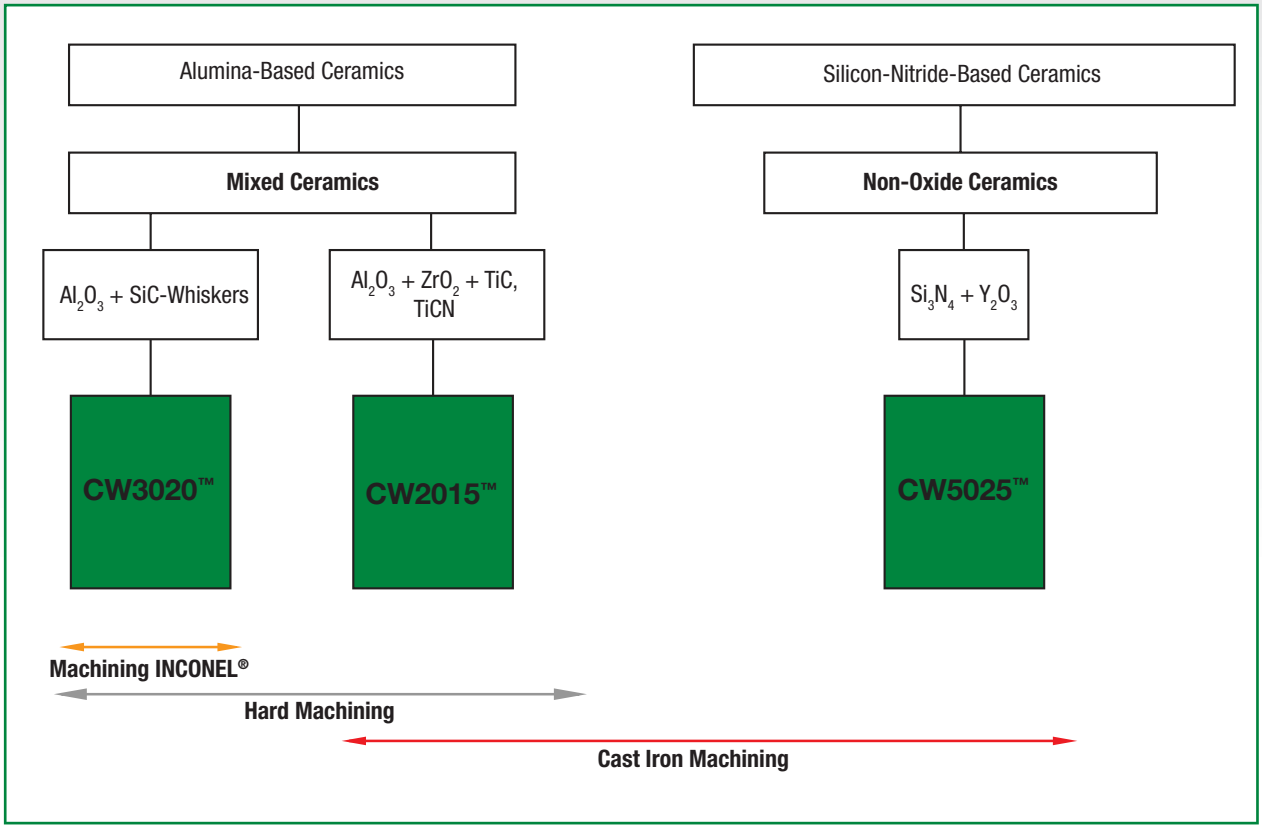


main group	sub-group (symbol)	feature
hard metal	HW	Uncoated WC-base hard metal
	HT	Uncoated TiC/TiN-base hard metal (cermets)
	HC	Coated hard metal
ceramics	CA	Al_2O_3-base oxide ceramics
	CM	Composite ceramics Al_2O_3 + metal carbide
	CN	Si_3N_4-base nitride ceramics
	CC	Coated ceramics
cubic boron nitride	BL	Cubic boron nitride (CBN) with low CBN content
	BH	Cubic boron nitride (CBN) with high CBN content
diamond	DP	Polycrystalline diamond (PCD)

Ceramic Inserts for Hard Turning, Turning in Cast Iron Materials, and Turning in High-Temp Alloys

- Ceramics offer greater wear resistance and toughness.
- Ceramics can be used in high-speed, continuous, and lightly interrupted turning applications in cast iron materials.
- Ceramics can be used for high-speed applications in high-temp alloys.

Ceramic Turning Grades



CW2015™

- Alumina and titanium carbo-nitride.
- High hardness and wear resistance.
- TiCN increases strength and hardness.
- Black in color.

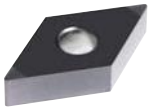
CW3020™

- Alumina + SiC whisker.
- High hardness and wear resistance.
- Whisker ceramic with elongated crystals and very high strength.
- Gray-green color.

CW5025™

- Pure silicon-nitride composition.
- Used in high-speed turning applications.
- Designed for use in gray cast iron and lower-tensile ductile irons.

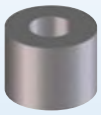
PcBN Grades for Hard Turning, Powder Metal, and Gray Cast Iron Machining



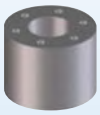
- PVD-coated grades available.
- Complete range of CBN grades for continuous to heavily interrupted turning.
- Industry-leading grades for gray cast iron machining.
- Full line of grades for hard turning.
- For best performance: solid, full-top, and tipped inserts are available.

Hard Turning Grades

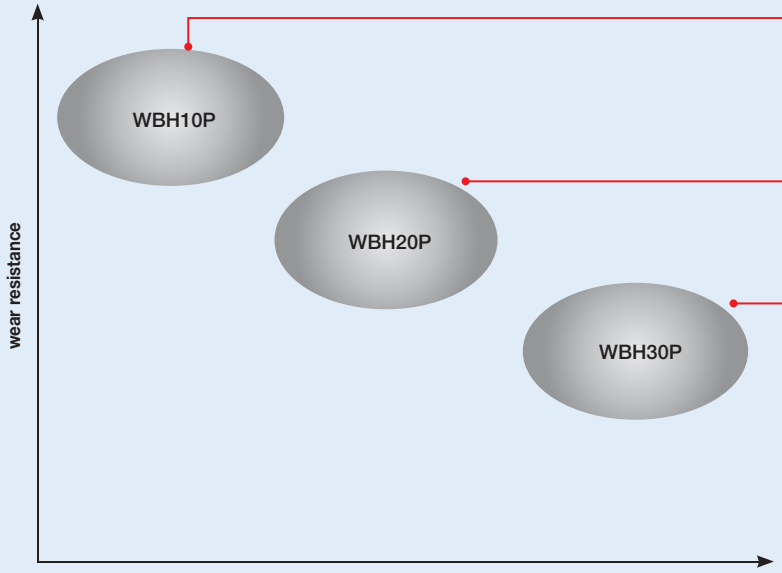
Low-Content CBN Grades for Fine Finishing in Continuous Cutting



Medium-Content CBN Grades for Continuous to Interrupted Cutting



High-Content CBN Grades for Heavily Interrupted Cuts

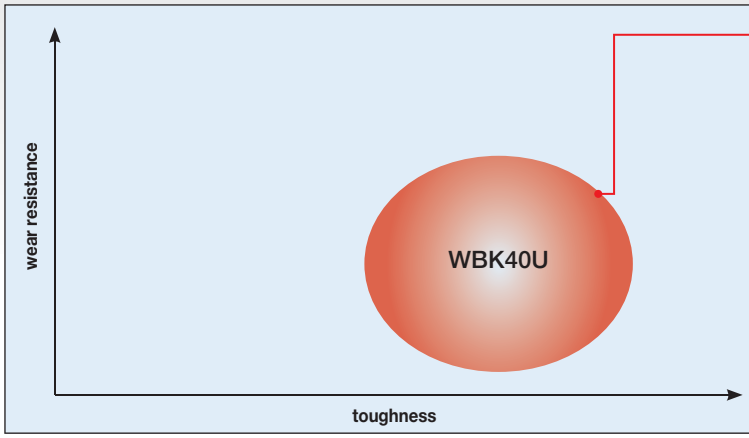


WBH10P™
- PVD-coated low-content grade.
- Coating provides thermal barrier to reduce crater wear.
- High temperature-resistant ceramic binder improves high-speed capability.

WBH20P™
- PVD-coated medium-content grade.
- Coating provides thermal barrier to reduce crater wear.
- Withstands moderate interruptions.

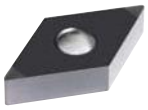
WBH30P™
- PVD-coated high content grade.
- Superior abrasion resistance.
- Withstands heaviest interruptions.

Gray Cast Iron Grade



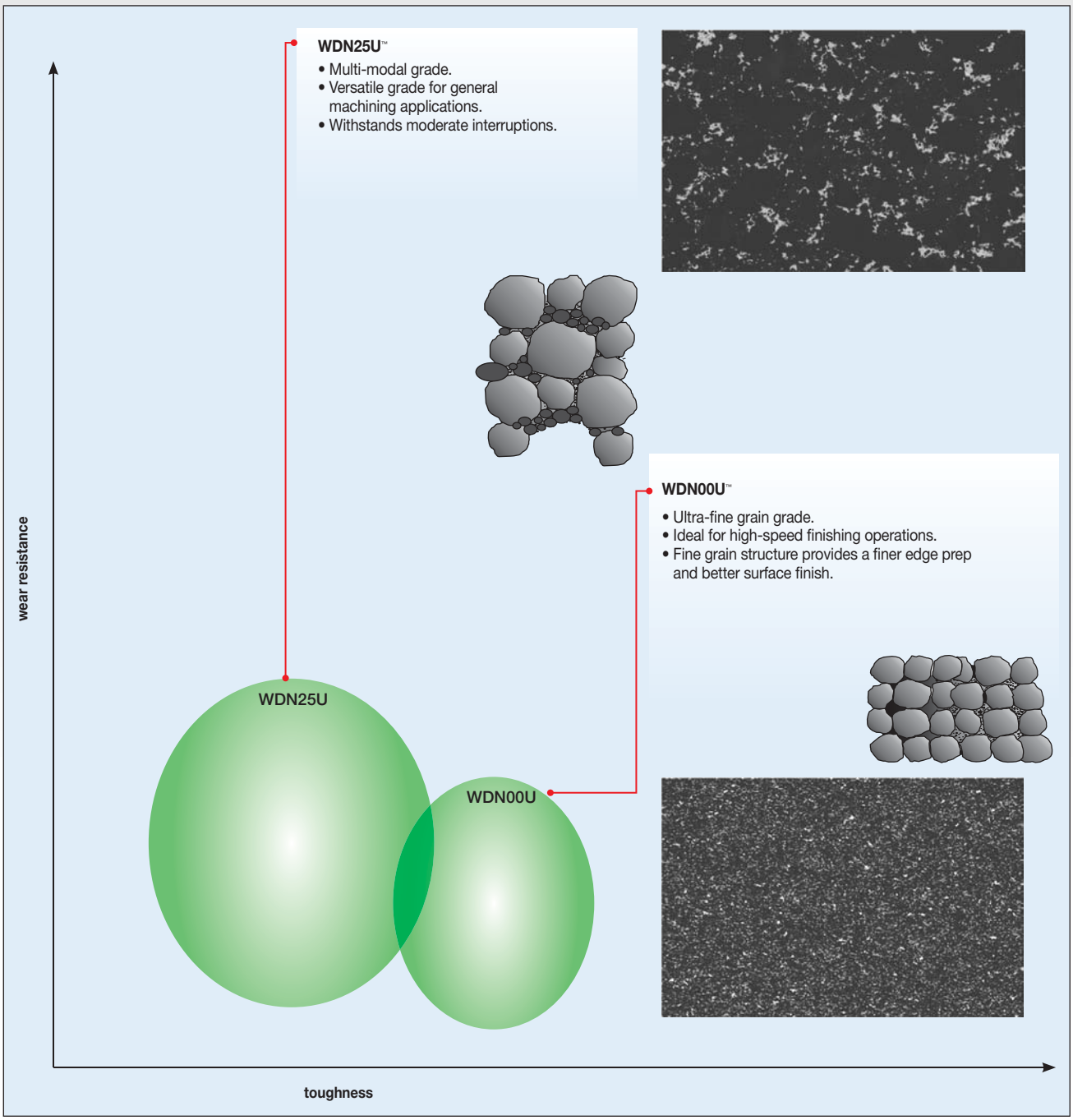
WBK40U™
- Uncoated high-content grade, solid inserts only.
- Superior abrasion resistance enables high material removal rates.
- Withstands heaviest interruptions.

PCD Grades for Turning Non-Ferrous Materials

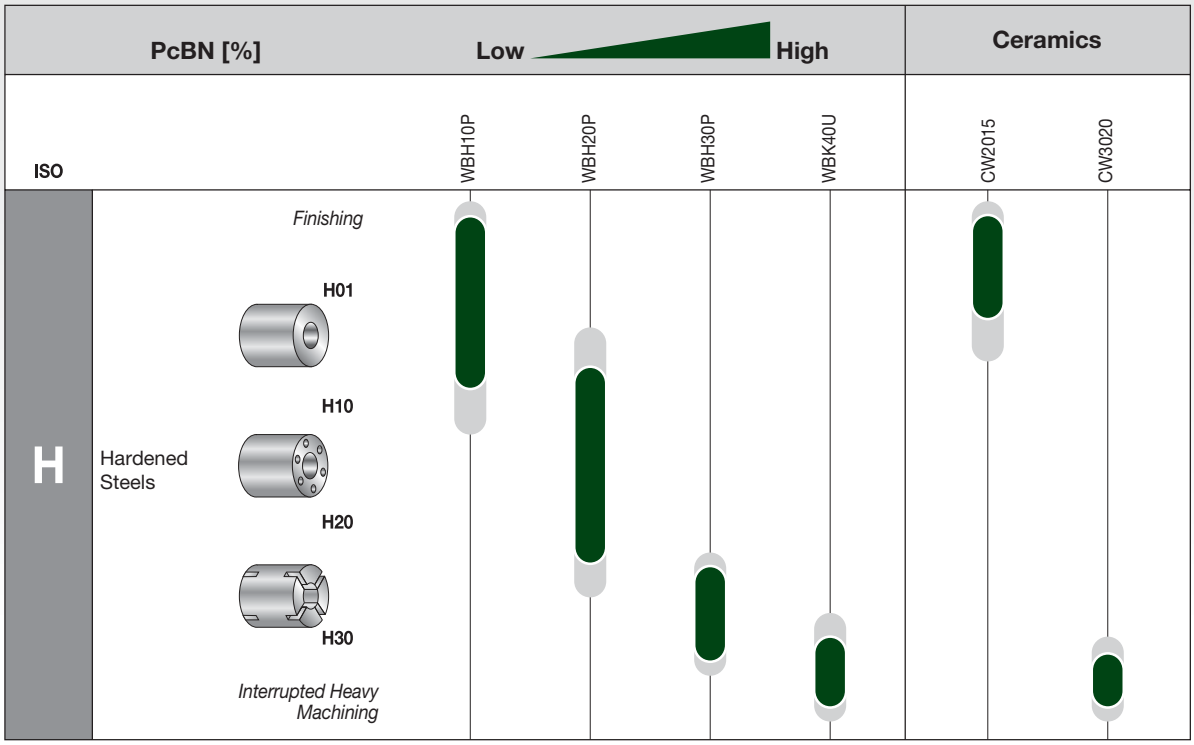


- Two PCD grades — WDN25U and WDN00U — cover a wide range of applications.
- Grades provide outstanding performance to increase productivity and cut manufacturing costs.
- High abrasion and chipping resistance.
- Used in machining aluminum alloys with low- and high-silicon content, copper alloys, ceramics, and plastics.
- Suitable for machining highly abrasive materials such as titanium and Metal Matrix Composites (MMC).

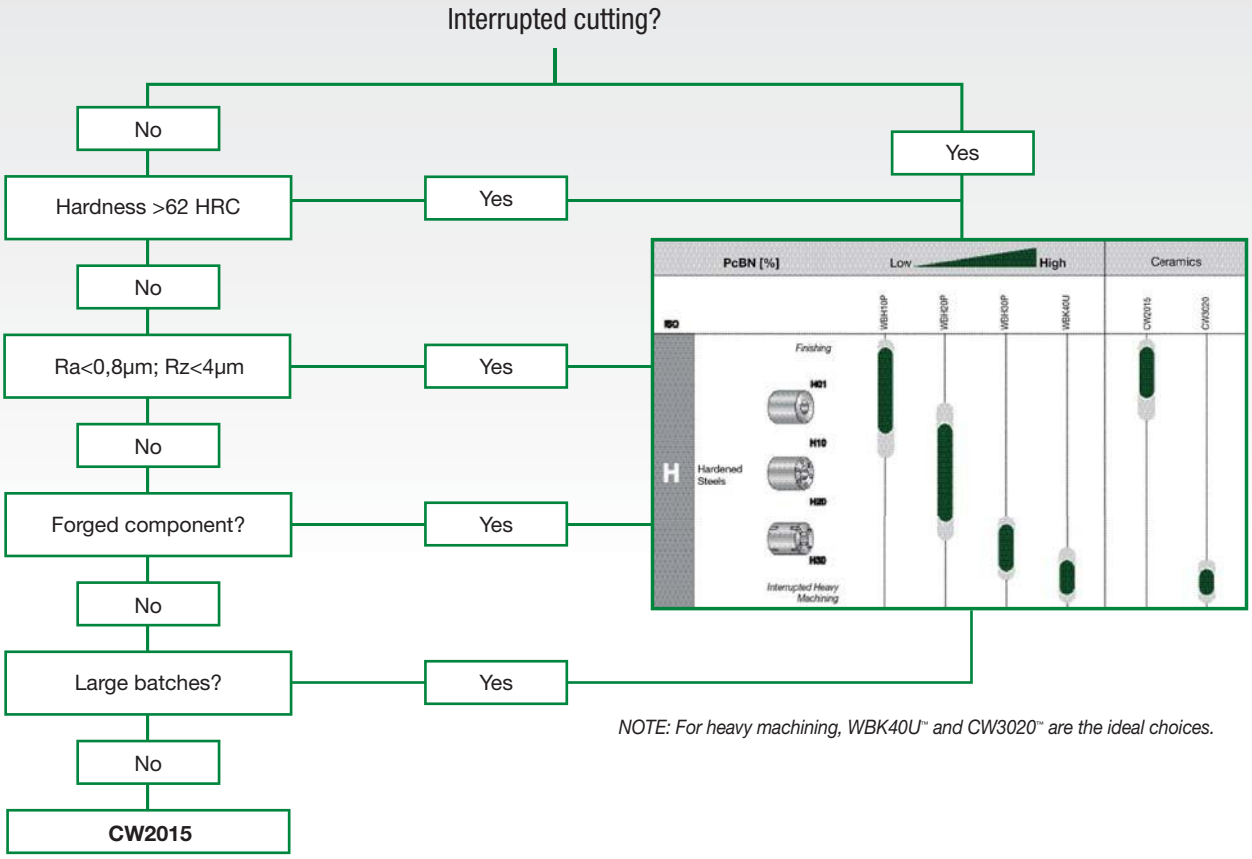
Non-Ferrous Grades



Advanced Materials for Hard Turning

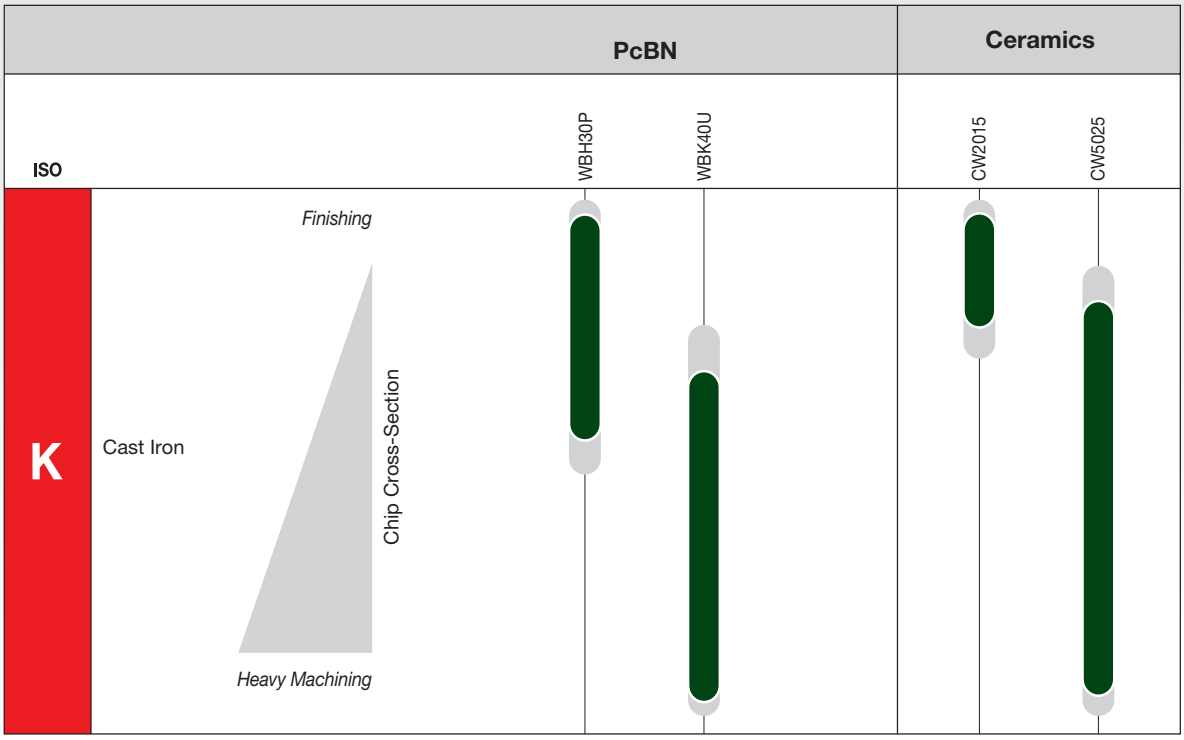


Hard Turning Grade Selection

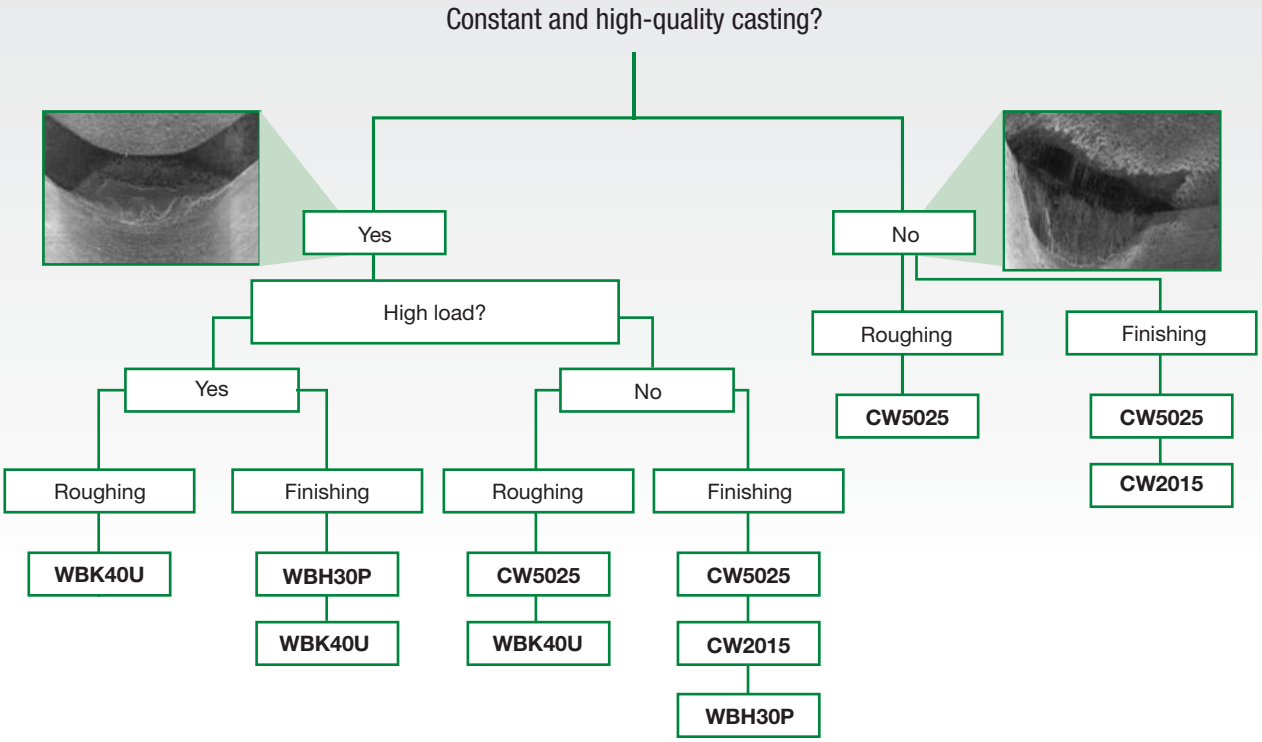


NOTE: For heavy machining, WBK40U™ and CW3020™ are the ideal choices.

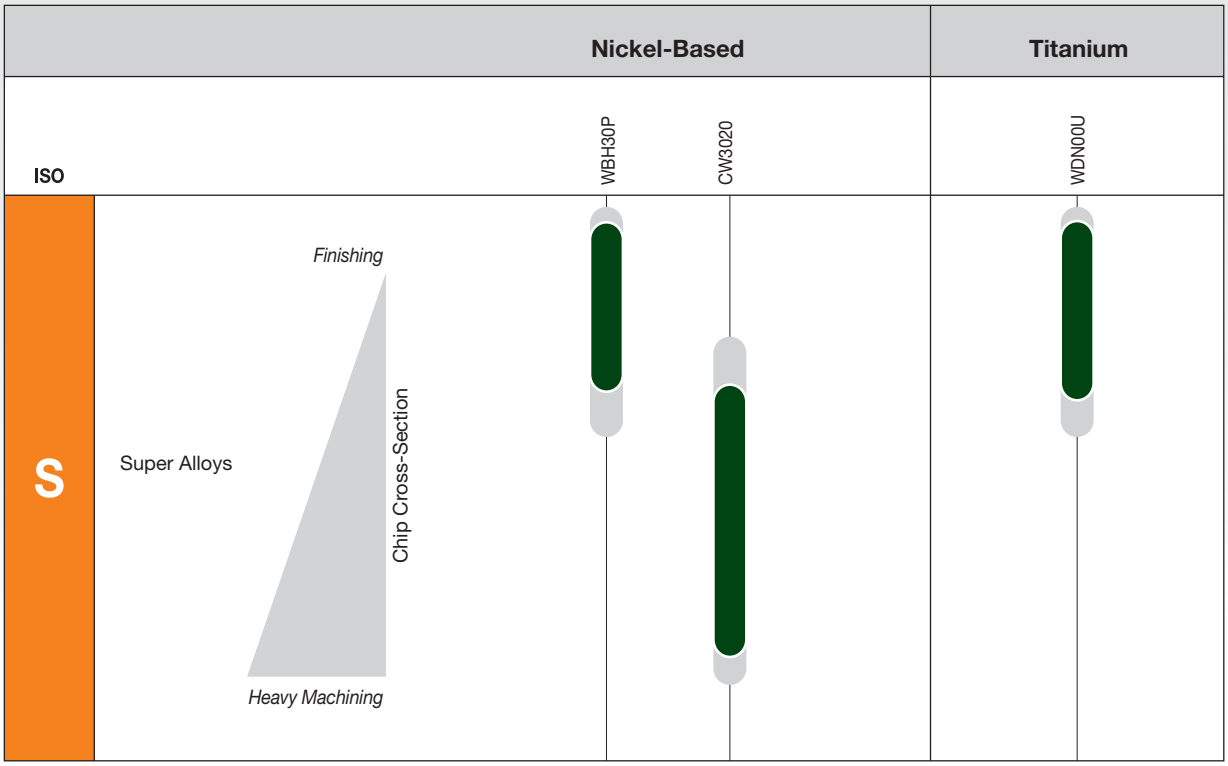
Advanced Materials for Cast Iron Machining



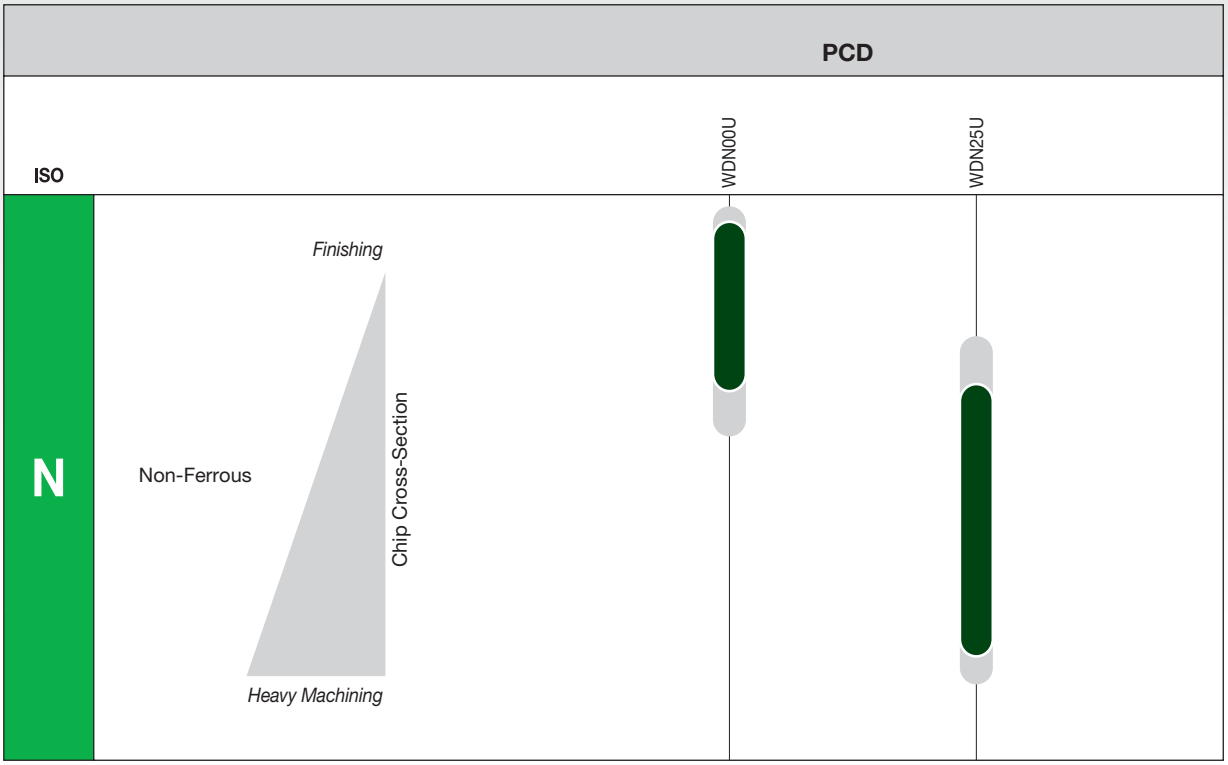
Cast Iron Machining Grade Selection



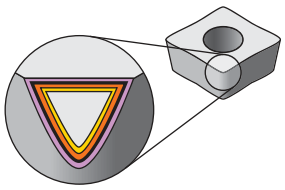
Advanced Materials for High-Temperature Machining



Advanced Materials for Non-Ferrous Machining



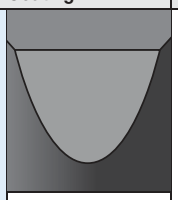
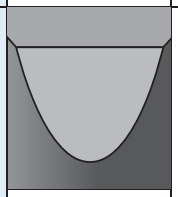
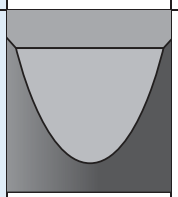
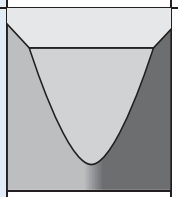
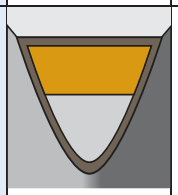
Grades and Grade Descriptions



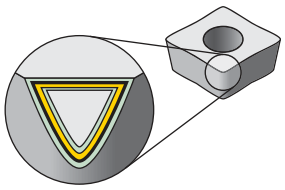
Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
CW2015	 CM-H10	Mixed (black) ceramic. Matrix Al_2O_3 and TiCN. Good toughness properties combined with good wear resistance. Semi-finishing and finishing. For hardened iron base materials and gray cast iron (finishing).	K									
			H									
CW5025	 CN-K15	Silicon-nitride ceramic. Extraordinary toughness properties. Roughing, also in heavily interrupted cuts. Capable of high-performance turning. To be used with or without coolant. For gray cast iron.	K									
CW3020	 C4	Whisker ceramic with a matrix of Al_2O_3 + SiCw. The SiC whiskers embedded in the micro-structure give this ceramic excellent toughness for cutting high-temp alloys and cast materials with high Brinell hardness.	S									
			H									
WBK40U	 BN-K40	A high-content CBN, solid CBN insert with multiple cutting edges. Applied in roughing to finishing of fully pearlitic gray cast iron, chilled irons, high-chrome alloyed steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Use for finishing chilled and fully pearlitic cast iron. Solid inserts offer better security and shock resistance than tipped inserts, while also enabling deeper depth-of-cut capability.	K									
			H									
WBH10P	 BN-H10	A low-content CBN grade with a PVD-AlTiN coating for added wear resistance. Designed for precision machining of hardened steels (>45 HRC); the harder the steel the better. PVD coating offers improved wear resistance and excellent surface finish capability. Effectively applied on bearing steels, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings.	H									

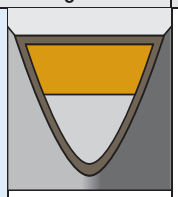
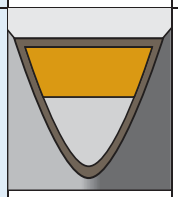
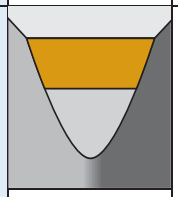
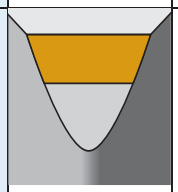
Grades and Grade Descriptions



Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WBH20P	 BN-H25	A PVD-AlTiN coating over a low-content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings.	H									
WBH30P	 BN-H30	A PVD-AlTiN coating over a low-content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). Applied on gray cast iron, chilled irons, high-chrome alloyed steels, high-temp alloys, and sintered powdered metals.	K									
			S									
			H									
WDN00U	 DP-N10	An ultra-fine grained polycrystalline diamond (PCD) tip brazed onto a carbide substrate. Designed for general-purpose turning of primarily non-ferrous materials. Applied over a wide range of continuous to interrupted cuts where superior surface finish is needed. Use on low to medium silicon content aluminum alloys, non-metallics, copper, brass, and zinc-based alloys. The ultra-fine grained diamond particle size enables superior surface finishes while ensuring the best mechanical shock resistance of any PCD cutting tool.	N									
			S									
WDN25U	 DP-N25	A multi-modal PCD grade with a range of grain sizes brazed onto a carbide substrate. Engineered for extreme abrasion resistance and good edge strength for demanding applications. An ideal choice for high-silicon aluminum alloys, bi-metallic (AL/GCI) materials, MMC, carbon-fiber reinforced plastics, and other abrasive non-metallic materials.	N									

Grade available as custom solution only.

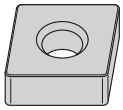
Speed and Feed Chart • Ceramics • Metric

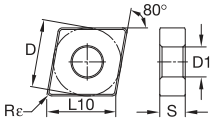
Material Group		Cutting Speed — vc m/min								
		CW2015			CW3020			CW5025		
		min	Start	max	min	Start	max	min	Start	max
ap [mm]		0,5		4,0	0,5		4,0	1,0		8,0
f [mm/rev]		0,2		0,4	0,1		0,5	0,2		0,6
P	0	–	–	–	–	–	–	–	–	–
	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
K	1	250	**475**	725	–	–	–	250	**760**	1000
	2	300	**550**	800	–	–	–	275	**365**	490
	3	250	**400**	600	–	–	–	275	**335**	440
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
	7	–	–	–	–	–	–	–	–	–
	8	–	–	–	–	–	–	–	–	–
S	1	–	–	–	170	**200**	375	–	–	–
	2	–	–	–	170	**200**	375	–	–	–
	3	–	–	–	190	**250**	375	–	–	–
	4	–	–	–	–	–	–	–	–	–
H	1	60	**100**	140	45	**85**	125	–	–	–
	2	60	**100**	140	45	**85**	125	–	–	–
	3	60	**100**	140	45	**85**	125	–	–	–
	4	60	**100**	140	45	**85**	125	–	–	–

Speed and Feed Chart • PcBN PCD • Metric

Cutting Speed — vc m/min																			
Material Group		WBH10P			WBH20P			WBH30P			WBK40U			WDN00U			WDN25U		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
ap [mm]		0,10		0,50	0,10		0,50	0,08		0,40	0,10		1,50	0,20		2,00	0,20		2,00
f [mm/rev]		0,06		0,25	0,05		0,20	0,05		0,20	0,08		0,20	0,10		0,30	0,10		0,25
P	0/1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K	1	–	–	–	–	–	–	400	**600**	800	650	**800**	1200	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	500	**765**	2500	500	**765**	2500
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	350	**580**	1000
	3	–	–	–	–	–	–	–	–	–	–	–	–	250	**520**	1000	250	**520**	1000
	4	–	–	–	–	–	–	–	–	–	–	–	–	250	**400**	750	250	**400**	750
	5	–	–	–	–	–	–	–	–	–	–	–	–	550	**760**	1000	550	**760**	1000
	6	–	–	–	–	–	–	–	–	–	–	–	–	400	**460**	850	400	**365**	750
	7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	120	**160**	200	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	120	**160**	200	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	120	**160**	200	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	100	**180**	320	–	–	–
H	1	80	**170**	260	80	**160**	230	60	**120**	220	60	**120**	220	–	–	–	–	–	–
	2	80	**170**	260	80	**160**	230	60	**120**	220	60	**120**	220	–	–	–	–	–	–
	3	80	**170**	260	80	**160**	230	60	**120**	220	60	**120**	220	–	–	–	–	–	–
	4	80	**170**	260	80	**160**	230	60	**120**	220	60	**120**	220	–	–	–	–	–	–

Ceramic Inserts • CNGA



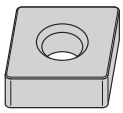


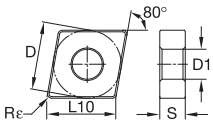
● first choice
○ alternate choice

P				
M				
K	●		●	
N				
S		●		
H	●			

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGA120404T02020	12,70	12,90	4,76	0,4	5,16	2952526	-	-
CNGA120408T02020	12,70	12,90	4,76	0,8	5,16	2952527	-	2952159
CNGA120412T02020	12,70	12,90	4,76	1,2	5,16	2952528	-	2952161
CNGA120416T02020	12,70	12,90	4,76	1,6	5,16	-	-	2952173
CNGA160612T02020	15,88	16,12	6,35	1,2	6,35	2952529	-	-
CNGA160616T02020	15,88	16,12	6,35	1,6	6,35	-	-	2952175

Ceramic Inserts • CNGA-FW



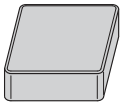


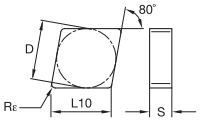
● first choice
○ alternate choice

P				
M				
K	●		●	
N				
S		●		
H	●			

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGA120412T01020FW	12,70	12,90	4,76	1,2	5,16	-	-	2952160

Ceramic Inserts • CNGN/CNG





● first choice
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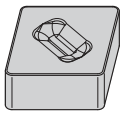
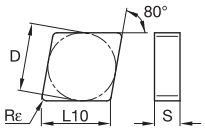
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
CNGN120404T02020	12,70	12,90	4,76	0,4	2952551	-	-
CNGN120408T01020	12,70	12,90	4,76	0,8	-	3869578	-
CNGN120408T02020	12,70	12,90	4,76	0,8	2952552	-	-
CNGN120412T01020	12,70	12,90	4,76	1,2	-	3869579	-
CNGN120412T02020	12,70	12,90	4,76	1,2	2952603	-	-
CNGN120712T01020	12,70	12,90	7,94	1,2	-	3869581	-
CNGN120712T02020	12,70	12,90	7,94	1,2	2952605	-	2952115

Ceramic Inserts • CNGX





● first choice
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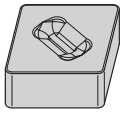
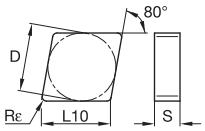
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
CNGX120712T02020	12,70	12,90	7,94	1,2	-	-	2952119

Ceramic Inserts • CNMX





● first choice
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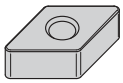
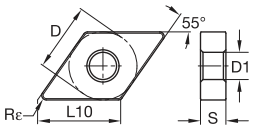
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
CNMX120712T02020	12,70	12,90	7,94	1,2	'	'	2952122
CNMX120716T02020	12,70	12,90	7,94	1,6	'	'	2952123

Ceramic Inserts • DNGA





● first choice
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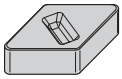
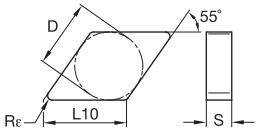
ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
DNGA150404T02020	12,70	15,50	4,76	0,4	5,16	2952532	'	'
DNGA150408T02020	12,70	15,50	4,76	0,8	5,16	2952533	'	'
DNGA150412T02020	12,70	15,50	4,76	1,2	5,16	2952534	'	'
DNGA150604T02020	12,70	15,50	6,35	0,4	5,16	2952535	'	'
DNGA150608T02020	12,70	15,50	6,35	0,8	5,16	2952536	'	'
DNGA150612T02020	12,70	15,50	6,35	1,2	5,16	2952537	'	2952185

Ceramic Inserts • DNGX





● first choice
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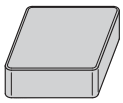
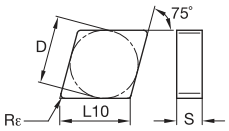
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
DNGX120712T02020	10,00	12,21	7,94	1,2	-	-	2952124
DNGX150712T02020	12,70	15,50	7,94	1,2	-	-	2952127
DNGX150716T02020	12,70	15,50	7,94	1,6	-	-	2952128

Ceramic Inserts • ENGN/ENG





● first choice
○ alternate choice

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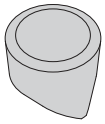
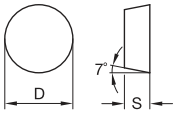
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
ENGN130712T02020	12,70	13,15	7,94	1,2	2952613	-	-

Ceramic Inserts • RCGX/RCGV





● first choice
○ alternate choice

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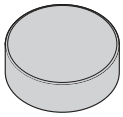
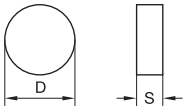
ISO catalogue number	D	S	CW2015	CW3020	CW5025
RCGX060400T01020	6,35	4,76	-	3869746	-
RCGX090700T02020	9,53	7,92	2952694	-	-
RCGX090700T07015	9,53	7,92	2952695	-	-
RCGX090700T01020	9,53	7,94	2952693	3869747	-
RCGX120700T01020	12,70	7,92	-	3869748	-
RCGX120700T02020	12,70	7,92	2952697	-	-
RCGX120700T20015	12,70	7,92	2952698	-	-

Ceramic Inserts • RNGN/RNG





● first choice
○ alternate choice

	CW2015	CW3020	CW5025
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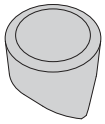
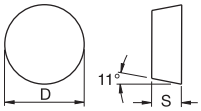
ISO catalogue number	D	S	CW2015	CW3020	CW5025
RNGN090300T01020	9,53	3,18	-	3869749	-
RNGN090400T02020	9,53	4,76	2952615	-	-
RNGN120400T01020	12,70	4,76	-	3869750	-
RNGN120400T02020	12,70	4,76	2952616	-	2952131
RNGN120700T01020	12,70	7,94	-	3869751	-
RNGN120700T02020	12,70	7,94	2952617	-	-
RNGN120700T10015	12,70	7,94	2952618	-	-
RNGN120700T20015	12,70	7,94	2952619	-	-

Ceramic Inserts • RPGX/RPGV





● first choice
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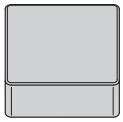
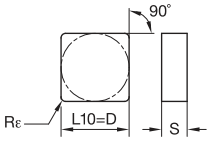
ISO catalogue number	D	S	CW2015	CW3020	CW5025
RPGX060400T01020	6,35	4,78	-	3869753	-
RPGX090700T01020	9,53	7,92	-	3869754	-
RPGX120700T01020	12,70	7,94	-	3869755	-

Ceramic Inserts • SNGN/SNG





● first choice
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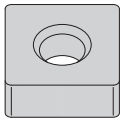
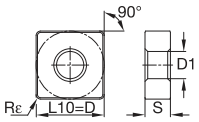
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
SNGN120408T00520	12,70	12,70	4,76	0,8	2952750	-	-
SNGN120408T02020	12,70	12,70	4,76	0,8	2952751	-	-
SNGN120412T01020	12,70	12,70	4,76	1,2	-	3869756	-
SNGN120412T02020	12,70	12,70	4,76	1,2	2952752	-	2952136
SNGN120708T02020	12,70	12,70	7,94	0,8	2952825	-	-
SNGN120712T02020	12,70	12,70	7,94	1,2	2952826	-	-
SNGN120716T00520	12,70	12,70	7,94	1,6	2953340	-	-
SNGN190720K20015	19,05	19,05	7,94	2,0	2952832	-	-

Ceramic Inserts • SNGA





● first choice
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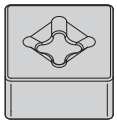
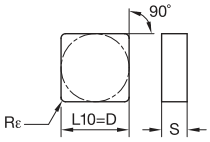
ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SNGA120408T02020	12,70	12,70	4,76	0,8	5,16	2952538	'	'
SNGA120412T02020	12,70	12,70	4,76	1,2	5,16	2952539	'	'

Ceramic Inserts • SNGX





● first choice
○ alternate choice

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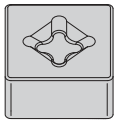
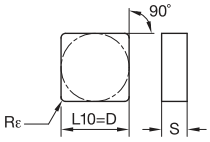
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
SNGX120712T02020	12,70	12,70	7,94	1,2	'	'	2952142

Ceramic Inserts • SNMX





● first choice
○ alternate choice

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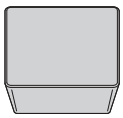
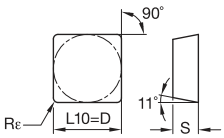
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
SNMX120712T02020	12,70	12,70	7,94	1,2	-	-	2952069
SNMX120716T02020	12,70	12,70	7,94	1,6	-	-	2952070

Ceramic Inserts • SPGN/SPG





● first choice
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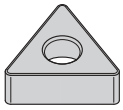
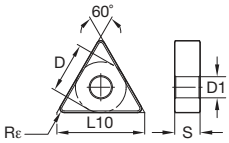
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
SPGN120308T01020	12,70	12,70	3,18	0,8	2952702	-	-

Ceramic Inserts • TNGA





● first choice
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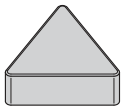
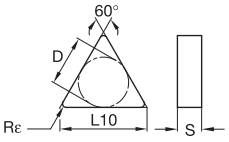
ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
TNGA160408T02020	9,53	16,50	4,76	0,8	3,81	2952541	-	2952195
TNGA160412T02020	9,53	16,50	4,76	1,2	3,81	2952542	-	-
TNGA220408T02020	12,70	22,00	4,76	0,8	5,16	2952544	-	-

Ceramic Inserts • TNGN/TNG





● first choice
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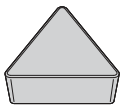
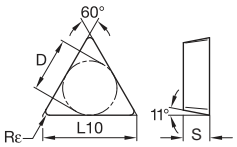
ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
TNGN160404T02020	9,53	16,50	4,76	0,4	2952835	-	-
TNGN160408T01020	9,53	16,50	4,76	0,8	-	3869761	-
TNGN160408T02020	9,53	16,50	4,76	0,8	2952836	-	-
TNGN160712T02020	9,53	16,50	7,94	1,2	2952840	-	-
TNGN220408T02020	12,70	22,00	4,76	0,8	2952841	-	-

Ceramic Inserts • TPGN/TPG





● first choice
○ alternate choice

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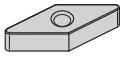
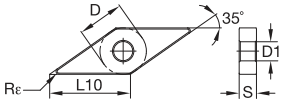
H	●		

ISO catalogue number	D	L10	S	Rε	CW2015	CW3020	CW5025
TPGN110304T01020	6,35	11,00	3,18	0,4	2952706	'	'
TPGN110308T01020	6,35	11,00	3,18	0,8	2952707	'	'
TPGN160304T00520	9,53	16,50	3,18	0,4	2952709	'	'
TPGN160304T01020	9,53	16,50	3,18	0,4	2952710	'	'
TPGN160308T00520	9,53	16,50	3,18	0,8	2952711	'	'
TPGN160308T01020	9,53	16,50	3,18	0,8	2952712	'	'

Ceramic Inserts • VNGA



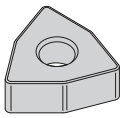


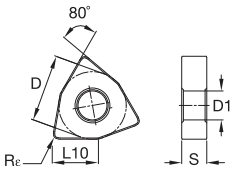
● first choice
○ alternate choice

P		
M		
K	●	●
N		
S	●	
H	●	

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
VNGA160404T02020	9,53	16,61	4,76	0,4	3,81	2952545	'	'
VNGA160408T02020	9,53	16,61	4,76	0,8	3,81	2952546	'	'
VNGA160412T02020	9,53	16,61	4,76	1,2	3,81	2952547	'	'

Ceramic Inserts • WNGA



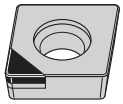


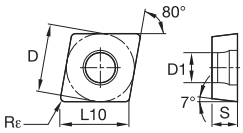
● first choice
○ alternate choice

P		
M		
K	●	●
N		
S	●	
H	●	

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
WNGA080408T02020	12,70	8,69	4,76	0,8	5,16	'	'	2952199
WNGA080412T02020	12,70	8,69	4,76	1,2	5,16	'	'	2952200

Polycrystalline Diamond Inserts (PCD) • CCGW-FST



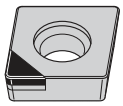


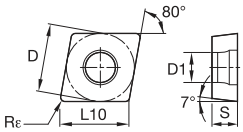
● first choice
○ alternate choice

	P	M	K	N	S	H
WDN00U				●	●	
WDN25U				●		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
CCGW060204FST	6,35	6,45	2,38	0,4	2,80	5885722	3898746
CCGW09T304FST	9,53	9,67	3,97	0,4	4,40	5885723	3898749
CCGW09T308FST	9,53	9,67	3,97	0,8	4,40	5885724	3898750

Polycrystalline Diamond Inserts (PCD) • CCMW-FST



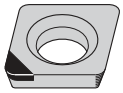


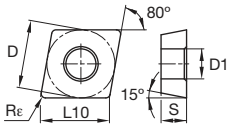
● first choice
○ alternate choice

	P	M	K	N	S	H
WDN00U				●	●	
WDN25U				●		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
CCMW09T304FST	9,53	9,67	3,97	0,4	4,40	-	3883134
CCMW09T308FST	9,53	9,67	3,97	0,8	4,40	-	3883136

Polycrystalline Diamond Inserts (PCD) • CDHB-FST



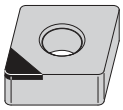


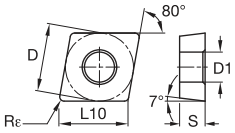
● first choice
○ alternate choice

	WDN00U	WDN25U
P		
M		
K		
N	●	●
S	●	
H		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
CDHBS4T0X0FST	3,97	4,03	1,02	0,1	2,13	-	3898745
CDHBS4T002FST	3,97	4,03	1,02	0,2	2,13	-	3898744

Polycrystalline Diamond Inserts (PCD) • CNGA-FST



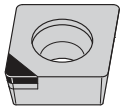


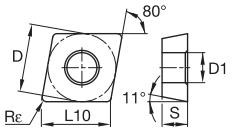
● first choice
○ alternate choice

	WDN00U	WDN25U
P		
M		
K		
N	●	●
S	●	
H		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
CNGA120404FST	12,70	12,90	4,76	0,4	5,16	-	3898726
CNGA120408FST	12,70	12,90	4,76	0,8	5,16	5885726	3898727

Polycrystalline Diamond Inserts (PCD) • CPGW-FWST



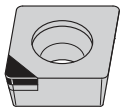


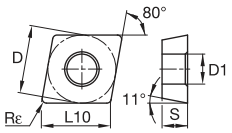
● first choice
○ alternate choice

P							
M							
K							
N						●	●
S						●	
H							

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
CPGW060204FWST	6,35	6,45	2,38	0,4	2,80	5885758	-

Polycrystalline Diamond Inserts (PCD) • CPGW-FST



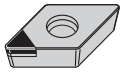


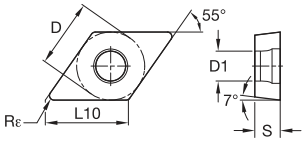
● first choice
○ alternate choice

P							
M							
K							
N						●	●
S						●	
H							

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
CPGW060204FST	6,35	6,45	2,38	0,4	2,80	-	3898752
CPGW060208FST	6,35	6,45	2,38	0,8	2,80	-	3898753

Polycrystalline Diamond Inserts (PCD) • DCGW-FST



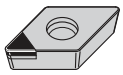


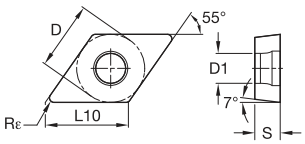
● first choice
○ alternate choice

	WDN00U	WDN25U
P		
M		
K		
N	●	●
S	●	
H		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
DCGW070204FST	6,35	7,75	2,38	0,4	2,80	-	3898761
DCGW11T304FST	9,53	11,63	3,97	0,4	4,40	-	3898762

Polycrystalline Diamond Inserts (PCD) • DCMW-FST



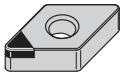


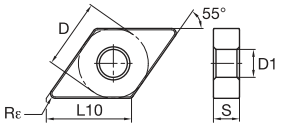
● first choice
○ alternate choice

	WDN00U	WDN25U
P		
M		
K		
N	●	●
S	●	
H		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
DCMW070204FST	6,35	7,75	2,38	0,4	2,80	-	3883142
DCMW11T304FST	9,53	11,63	3,97	0,4	4,40	-	3883122
DCMW11T308FST	9,53	11,63	3,97	0,8	4,40	-	3883143

Polycrystalline Diamond Inserts (PCD) • DNGA-FST



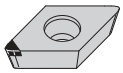


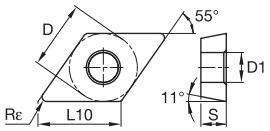
● first choice
○ alternate choice

	P	M	K	N	S	H
WDN00U				●	●	
WDN25U				●		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
DNGA150408FST	12,70	15,50	4,76	0,8	5,16	5885775	3898731

Polycrystalline Diamond Inserts (PCD) • DPGW-FST



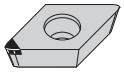


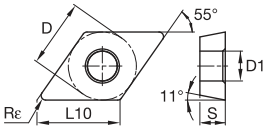
● first choice
○ alternate choice

	P	M	K	N	S	H
WDN00U				●	●	
WDN25U				●		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
DPGW070202FST	6,35	7,75	2,38	0,2	2,80	5885778	-

Polycrystalline Diamond Inserts (PCD) • DPGW-FWST



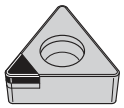


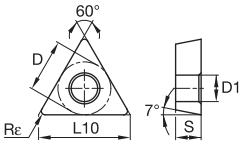
● first choice
○ alternate choice

P							
M							
K							
N						●	●
S						●	
H							

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
DPGW11T304FWST	9,53	11,63	3,97	0,4	4,40	5885791	-

Polycrystalline Diamond Inserts (PCD) • TCGW-FST



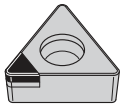


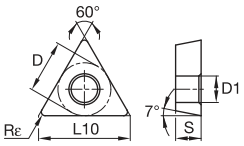
● first choice
○ alternate choice

P							
M							
K							
N						●	●
S						●	
H							

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
TCGW110204FST	6,35	11,00	2,38	0,4	2,80	-	3898768
TCGW16T304FST	9,53	16,50	3,97	0,4	4,40	-	3898769

Polycrystalline Diamond Inserts (PCD) • TCMW-FST



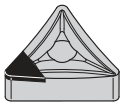


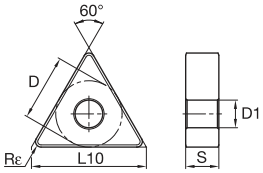
● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	●
H	

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
TCMW110204FST	6,35	11,00	2,38	0,4	2,80	'	3883144

Polycrystalline Diamond Inserts (PCD) • TNMS-FST



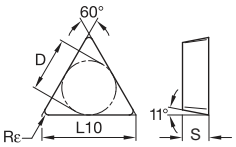


● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	●
H	

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
TNMS160404FST	9,53	16,50	4,76	0,4	3,81	'	3898734

Polycrystalline Diamond Inserts (PCD) • TPGN / TPG

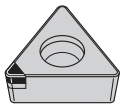


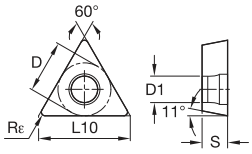
● first choice
○ alternate choice

P						
M						
K						
N					●	●
S					●	
H						

ISO catalogue number	D	L10	S	Rε	WDN00U	WDN25U
TPGN160304F	9,53	16,50	3,18	0,4	-	3898721

Polycrystalline Diamond Inserts (PCD) • TPGW-FST



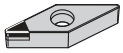


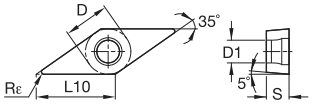
● first choice
○ alternate choice

P						
M						
K						
N					●	●
S					●	
H						

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
TPGW16T304FST	9,53	16,50	3,97	0,4	4,40	-	3898772

Polycrystalline Diamond Inserts (PCD) • VBGW-FST



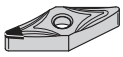


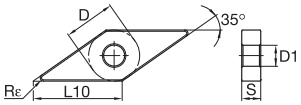
● first choice
○ alternate choice

P		
M		
K		
N	●	●
S	●	
H		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
VBGW110304FST	6,35	11,07	3,18	0,4	2,80	●	3898774
VBGW160404FST	9,53	16,61	4,76	0,4	4,40	●	3898775

Polycrystalline Diamond Inserts (PCD) • VNMS-FST



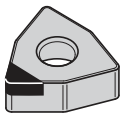


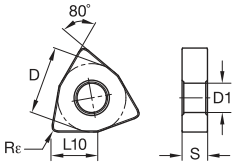
● first choice
○ alternate choice

P		
M		
K		
N	●	●
S	●	
H		

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
VNMS160408FST	9,53	16,61	4,76	0,8	3,81	●	3898739

Polycrystalline Diamond Inserts (PCD) • WNGA-FST



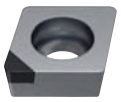


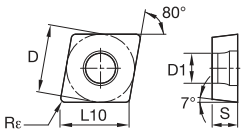
● first choice
○ alternate choice

P							
M							
K							
N						●	●
S						●	
H							

ISO catalogue number	D	L10	S	Rε	D1	WDN00U	WDN25U
WNGA080408FST	12,70	8,69	4,76	0,8	5,16	-	3898741

Cubic Boron Nitride (CBN) Inserts • CCGW-M



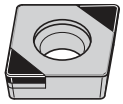


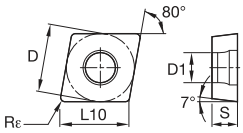
● first choice
○ alternate choice

P							
M							
K						●	●
N							
S						●	
H		●	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
CCGW09T308S01015M	9,53	9,67	3,99	0,8	4,40	-	6904774	-	-

Cubic Boron Nitride (CBN) Inserts • CCGW-MT



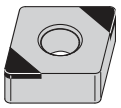


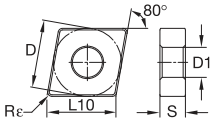
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
CCGW09T304S01015MT	9,53	9,67	3,99	0,4	4,40	3883507	6904777	-	-
CCGW09T308S01015MT	9,53	9,67	3,99	0,8	4,40	3883508	6904776	6018004	-
CCGW120408S01015MT	12,70	12,90	4,78	0,8	5,50	-	6904775	-	-

Cubic Boron Nitride (CBN) Inserts • CNGA-EMT



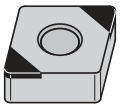


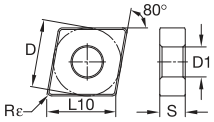
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
CNGA120408EMT	12,70	12,90	4,76	0,8	5,16	-	6904778	-	-

Cubic Boron Nitride (CBN) Inserts • CNGA-MT



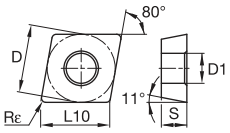


● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
CNGA120404S01025MT	12,70	12,90	4,78	0,4	5,16	3883509	6904779	-	-
CNGA120408S01025MT	12,70	12,90	4,78	0,8	5,16	3883510	6904780	6018008	-
CNGA120412S01020MT	12,70	12,90	4,78	1,2	5,16	-	-	6018009	-
CNGA120412S01025MT	12,70	12,90	4,78	1,2	5,16	-	6904821	6018010	-

Cubic Boron Nitride (CBN) Inserts • CPGW-C

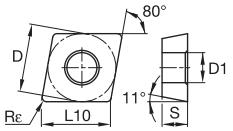


● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
CPGW060204S01015C	6,35	6,45	2,38	0,4	2,80	-	-	6018082	-

Cubic Boron Nitride (CBN) Inserts • CPGW-MT

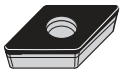


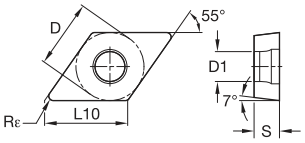
● first choice
○ alternate choice

	WBH10P	WBH20P	WBH30P	WBK40U
P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
CPGW09T308S01015MT	9,53	9,67	3,99	0,8	4,40	-	-	6018085	-

Cubic Boron Nitride (CBN) Inserts • DCGW-C



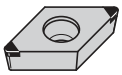


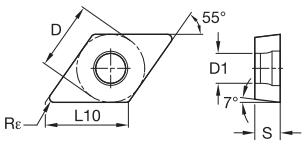
● first choice
○ alternate choice

	WBH10P	WBH20P	WBH30P	WBK40U
P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
DCGW070202S01015C	6,35	7,75	2,38	0,2	2,80	3883528	-	-	-
DCGW070204S01015C	6,35	7,75	2,38	0,4	2,80	3883529	-	-	-

Cubic Boron Nitride (CBN) Inserts • DCGW-MT



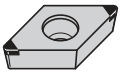


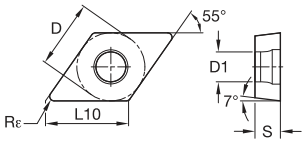
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
DCGW11T304S01015MT	9,53	11,63	3,99	0,4	4,40	3883530	6904823	6018088	-
DCGW11T308S01015MT	9,53	11,63	3,99	0,8	4,40	3883531	6904824	-	-

Cubic Boron Nitride (CBN) Inserts • DCMW-MT



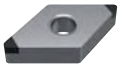


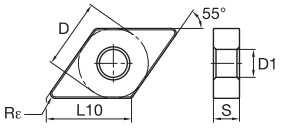
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
DCMW070204S01020MT	6,35	7,74	2,38	0,4	2,80	-	6904822	-	-

Cubic Boron Nitride (CBN) Inserts • DNGA-EMT



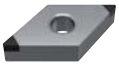


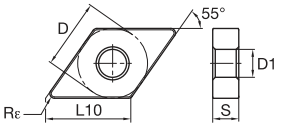
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
DNGA150408EMT	12,70	15,50	4,76	0,8	5,16	-	6904825	-	-
DNGA150412EMT	12,70	15,50	4,76	1,2	5,16	-	6904826	-	-

Cubic Boron Nitride (CBN) Inserts • DNGA-MT



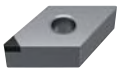


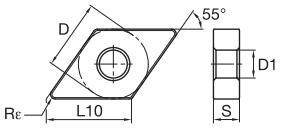
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
DNGA150404S01025MT	12,70	15,50	4,78	0,4	5,16	3883532	6904828	-	-
DNGA150408S01025MT	12,70	15,50	4,78	0,8	5,16	3883533	6904829	5108479	-
DNGA150608S01225MT	12,70	15,50	6,37	0,8	5,16	-	6904830	-	-

Cubic Boron Nitride (CBN) Inserts • DNMA-ST



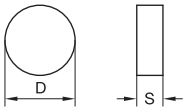


● first choice
○ alternate choice

	WBH10P	WBH20P	WBH30P	WBK40U
P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
DNMA150604S01020ST	12,70	15,50	6,35	0,4	5,16	-	6904827	-	-

Cubic Boron Nitride (CBN) Inserts • RNGN/RNG

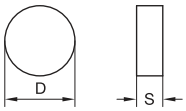


● first choice
○ alternate choice

	WBH10P	WBH20P	WBH30P	WBK40U
P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	S	WBH10P	WBH20P	WBH30P	WBK40U
RNGN120400S01020	12,70	4,76	-	6904851	-	-

Cubic Boron Nitride (CBN) Inserts • RNMN/RNM

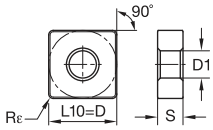


● first choice
○ alternate choice

P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	S	WBH10P	WBH20P	WBH30P	WBK40U
RNMN090300S02020	9,53	3,18	'	'	'	3883315
RNMN120300S02020	12,70	3,18	'	'	'	3883316
RNMN120400S02020	12,70	4,76	'	'	'	3883317

Cubic Boron Nitride (CBN) Inserts • SNGA-MT

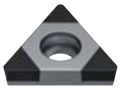


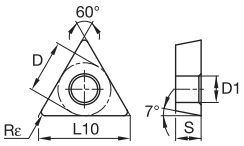
● first choice
○ alternate choice

P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
SNGA120408S01025MT	12,70	12,70	4,78	0,8	5,16	'	6904852	'	'

Cubic Boron Nitride (CBN) Inserts • TCGW-MT



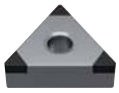


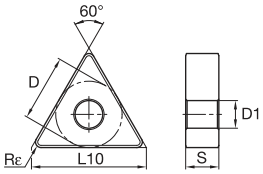
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
TCGW110204S01015MT	6,35	11,00	2,40	0,4	2,80	'	6904853	'	'
TCGW110208S01015MT	6,35	11,00	2,40	0,8	2,80	'	6904854	'	'
TCGW16T308S01015MT	9,53	16,50	3,99	0,8	4,40	'	6904855	'	'

Cubic Boron Nitride (CBN) Inserts • TNGA-MT



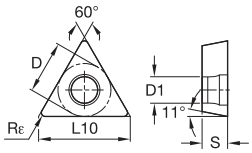


● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
TNGA160404S01025MT	9,53	16,50	4,78	0,4	3,81	'	6904856	'	'
TNGA160408S01025MT	9,53	16,50	4,78	0,8	3,81	'	6904857	'	'
TNGA160412S01225MT	9,53	16,50	4,78	1,2	3,81	'	6904865	'	'

Cubic Boron Nitride (CBN) Inserts • TPGW-C

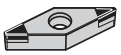


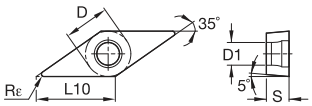
● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
TPGW110204S01015C	6,35	11,00	2,38	0,4	2,80	-	-	6018092	-
TPGW110208S01015C	6,35	11,00	2,38	0,8	2,80	-	-	6018093	-

Cubic Boron Nitride (CBN) Inserts • VBGW-MT



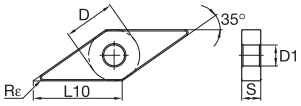


● first choice
○ alternate choice

P					
M					
K				●	●
N					
S				●	
H	●	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
VBGW160404S01015MT	9,53	16,61	4,78	0,4	4,40	3883536	-	6018094	-
VBGW160408S01015MT	9,53	16,61	4,78	0,8	4,40	3883537	-	6018095	-

Cubic Boron Nitride (CBN) Inserts • VNGA-MT

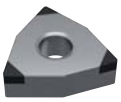


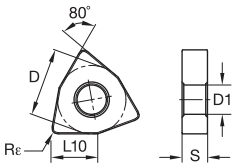
● first choice
○ alternate choice

P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
VNGA160404S01025MT	9,53	16,61	4,78	0,4	3,81	3883538	6904868	6018096	-
VNGA160408S01025MT	9,53	16,61	4,78	0,8	3,81	-	-	6018097	-
VNGA160408S01225MT	9,53	16,61	4,78	0,8	3,81	-	6904869	-	-

Cubic Boron Nitride (CBN) Inserts • WNGA-MT





● first choice
○ alternate choice

P				
M				
K			●	●
N				
S			●	
H	●	●	●	●

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH20P	WBH30P	WBK40U
WNGA080404S01015MT	12,70	8,69	4,78	0,4	5,16	-	6904870	-	-
WNGA080408S01225MT	12,70	8,69	4,78	0,8	5,16	-	6904871	-	-

Tools for External Turning

External Toolholder

WIDIA™ offers an extensive range of toolholders for external turning to meet even the most exacting production demands across a broad spectrum of workpieces, shapes, and sizes.

The complete program includes toolholders for pin-, screw-, or clamp-type holding to produce light finishing cuts at high cutting speeds or heavy roughing applications.

TOOLS FOR EXTERNAL TURNING

D-STYLE CLAMPING

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

P-STYLE CLAMPING

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.
- P-style available in metric sizes only.

S-STYLE CLAMPING

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

C-STYLE CLAMPING

- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

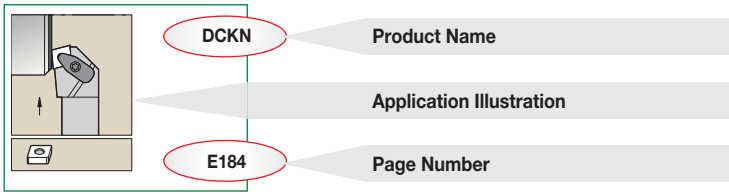
APPLICATIONS

TURNING FACING PROFILING CHAMFERING

INDUSTRY

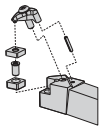
Toolholder Selection Guide

Each unique clamping system offers product options to fill your specific toolholder needs. Find the illustration that fits your application and navigate to the corresponding page to get the correct solution.



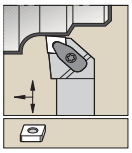
D-Style Clamping

D

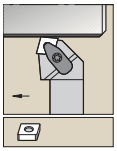


One-piece clamp assembly holder for use with negative style inserts. An extremely rigid clamping system. The tool is protected by a carbide shim.

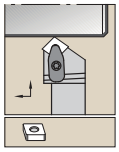
DCKN 75° **Page:** **E184**



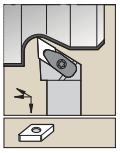
DCLN 95° **Page:** **E184**



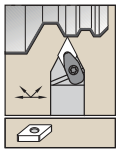
DCRN 75° **Page:** **E185**



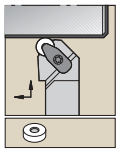
DCSN 45° **Page:** **E186**



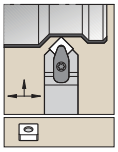
DDJN 93° **Page:** **E186**



DDNN 63° **Page:** **E187**

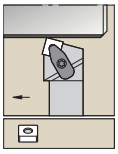


DRGN **Page:** **E187**

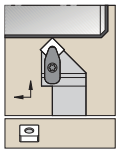


DSDN 45° **Page:** **E188**

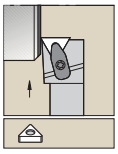
DSKN 75° **Page:** **E188**



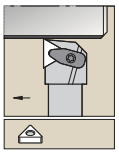
DSRN 75° **Page:** **E189**



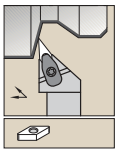
DSSN 45° **Page:** **E189**



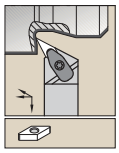
DTFN 90° **Page:** **E222**



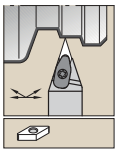
DTGN 90° **Page:** **E190**



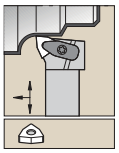
DVJN 93° **Page:** **E190**



DVON 117,5° **Page:** **E191**



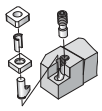
DVVN 72,5° **Page:** **E191**



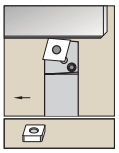
DWLN 95° **Page:** **E192**

P-Style Clamping

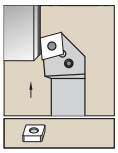
P



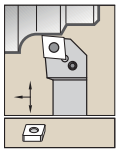
Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with chip flow.



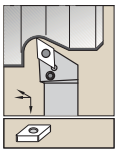
PCBN 75° **Page:** **E193**



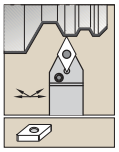
PCKN 75° **Page:** **E193**



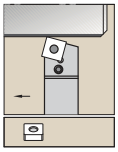
PCLN 95° **Page:** **E194**



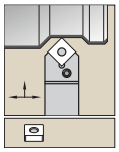
PDJN 93° **Page:** **E194**



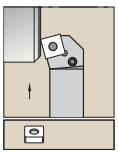
PDNN 62,5° **Page:** **E195**



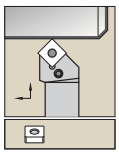
PSBN 75° **Page:** **E195**



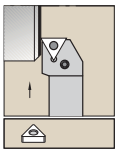
PSDN 45° **Page:** **E196**



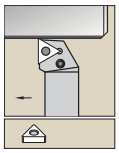
PSKN 75° **Page:** **E196**



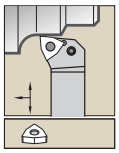
PSSN 45° **Page:** **E197**



PTFN 90° **Page:** **E197**



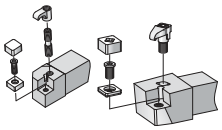
PTGN 90° **Page:** **E198**



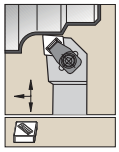
PWLN 95° **Page:** **E198**

C-Style Clamping

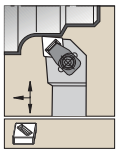
C



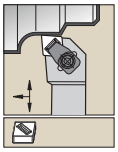
Top clamping system for negative and positive indexable inserts to DIN 4968. This universal clamping system is robust and easy to handle. Some height-adjustable clamps enable the use of additional chip-breakers. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs greater than 6,35mm.



CCLN-MX
95°
Page:
E199



CCLN-MN
95°
Page:
E199



CCLN-MF
95°
Page:
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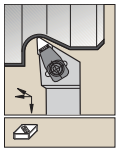
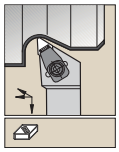


CDJN-MX
93°
Page:
–



CDJN-MN
93°
Page:
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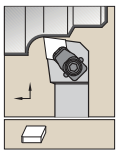

CELN-MF
97,5°
Page:
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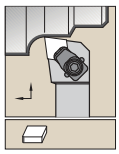

CELN-MN
97,5°
Page:
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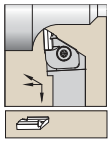
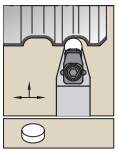
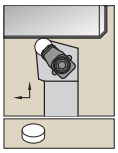


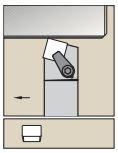
CKJN
Page:
E200



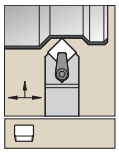
CRDN-MN
Page:
E201



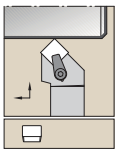
CRSN-MN
Page:
E200



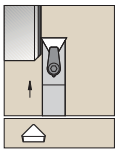
CSBP
75°
Page:
E202



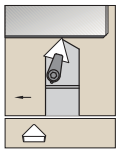
CSDP
45°
Page:
E203



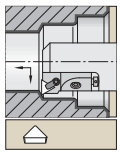
CSSP
45°
Page:
E203



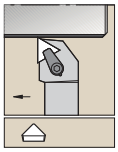
CTCP
90°
Page:
E204



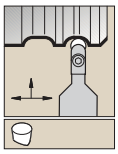
CTDP
45°
Page:
E204



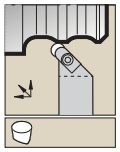
CTFP
90°
Page:
E230



CTGP
90°
Page:
E205



CRDP*
Page:
E205

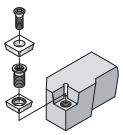


CRGP*
Page:
–

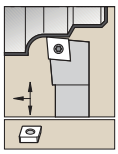
**Exact Clamping System not shown.*

S-Style Clamping

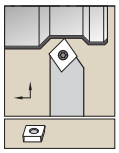
S



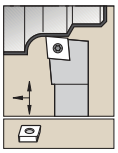
Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967. Compact design using a minimum of spare parts for high reliability and cost efficiency. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs from 9,52mm are secured by means of a threaded bushing.



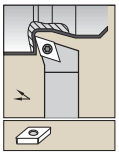
SCLC
95°
Page:
E207



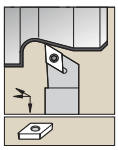
SCDP
45°
Page:
–



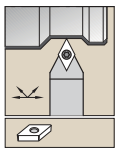
SCLP
95°
Page:
E233–E234



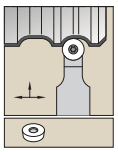
SDHC
107,5°
Page:
E207



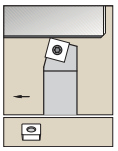
SDJC
93°
Page:
E208



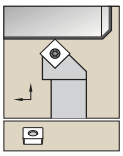
SDNC
62,5°
Page:
E208



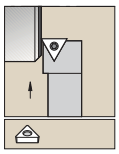
SRDC
Page:
E209



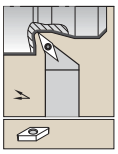
SSBC
75°
Page:
E209



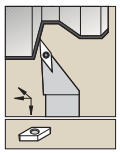
SSSC
45°
Page:
E210



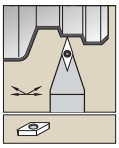
STFC
90°
Page:
E210



SVHB
107,5°
Page:
E211



SVJB
93°
Page:
E211



SVVB
72,5°
Page:
E212

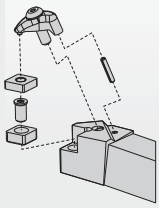
Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

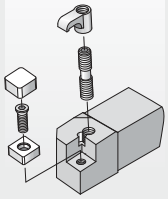
D

Insert Holding Method

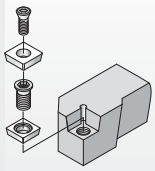
D



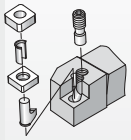
C



S

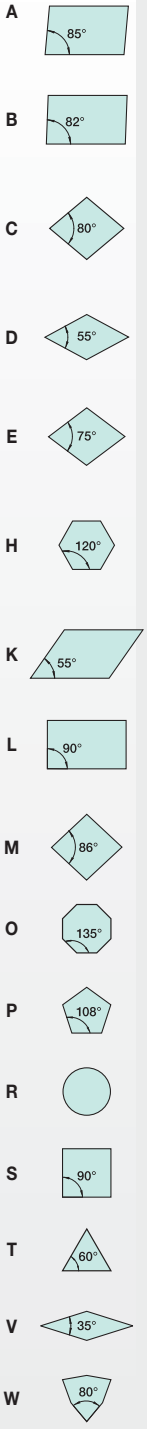


P



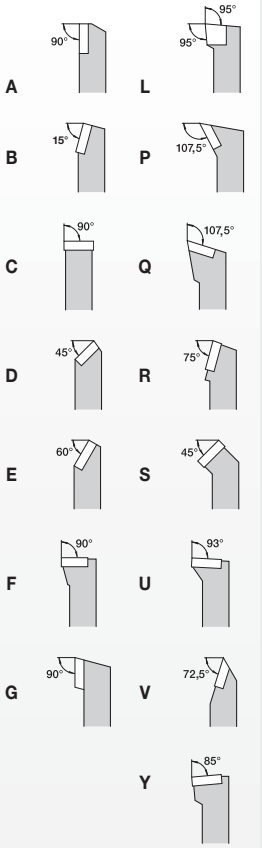
C

Insert Shape



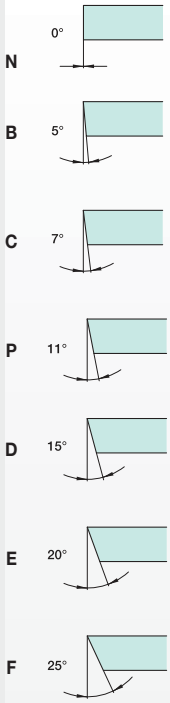
L

Tool Style or Lead Angle



N

Insert Clearance Angle



R

Hand of Tool

R =

Right hand

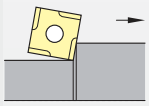
L =

Left hand

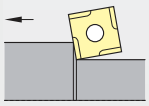
N =

Neutral

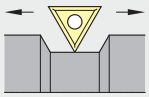
R



L



N



Additional Information

C =

Deep pocket for ceramic insert

S =

Single pocket locating wall

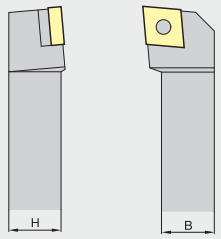
F =
Straight shank, no offset

Catalog Numbering System

(continued)

25 **25**

Shank Dimensions



The seventh and eighth position shall be a significant two-digit number that indicates the holder cross section.

- If the dimension for the width "B" or the height "H" is represented by a one-digit number, a 0 (zero) will be used in front of it.

Example: 8,0mm = 08

M

Tool Length

L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
Special Design	X

12

Insert Size

Cutting Edge Length

H Hexagon 120°

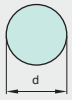
O Octagon 135°

P Pentagon 108°

S Square 90°

T Triangular 60°

R Round —



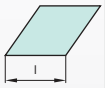
C Rhomboid 80°

D 55°

E 75°

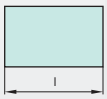
M 86°

V 35°

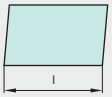


W Trigon 80° with enlarged corner angles

L Rectangular 90°



A Parallelogram 85°



B 82°

K 55°

KC

Additional Information

KC = D-Style Clamping

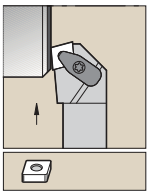
04

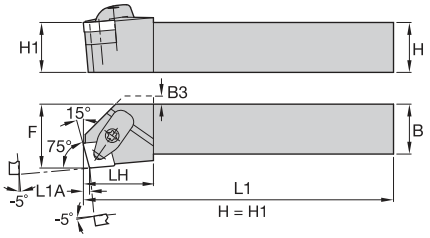
Insert Thickness (optional)

04 = 4,76mm

06 = 6,35mm

DCKN 75°

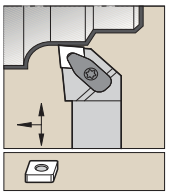


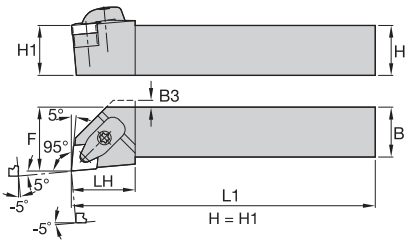


See pages E28–E42, E145, E159, E168–E169 for inserts.

order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert
right hand									
5697856	**DCKNR2020K12KC04**	20	20	25,0	125	32,0	3,1	6,0	CN..120408
5697857	**DCKNR2525M12KC04**	25	25	32,0	150	32,0	3,1	–	CN..120408
left hand									
5697854	**DCKNL2525M12KC04**	25	25	32,0	150	32,0	3,1	–	CN..120408

DCLN 95°

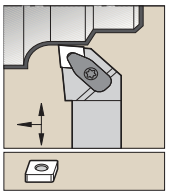




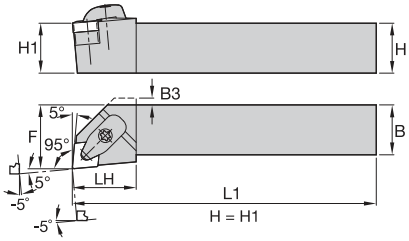
See pages E28–E42, E145, E159, E168–E169 for inserts.

order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5697891	**DCLNR2020K09KC03**	20	20	25,0	125	30,0	2,0	CN..090308
5697892	**DCLNR2020K12KC04**	20	20	25,0	125	32,0	4,0	CN..120408
5697893	**DCLNR2525M12KC04**	25	25	32,0	150	32,0	–	CN..120408
5697894	**DCLNR2525M16KC06**	25	25	32,0	150	33,0	–	CN..160612
5697895	**DCLNR3232P16KC06**	32	32	40,0	170	33,0	–	CN..160612
5697896	**DCLNR3232P19KC06**	32	32	40,0	170	40,0	–	CN..190612
5697897	**DCLNR4040S19KC06**	40	40	50,0	250	40,0	–	CN..190612
5697898	**DCLNR4040S25KC09**	40	40	50,0	250	51,0	–	CN..250924
left hand								
5697883	**DCLNL2020K12KC04**	20	20	25,0	125	32,0	4,0	CN..120408
5697884	**DCLNL2525M12KC04**	25	25	32,0	150	32,0	–	CN..120408
5697885	**DCLNL2525M16KC06**	25	25	32,0	150	33,0	–	CN..160612
5697886	**DCLNL3232P16KC06**	32	32	40,0	170	33,0	–	CN..160612
5697887	**DCLNL3232P19KC06**	32	32	40,0	170	40,0	–	CN..190612
5697888	**DCLNL4040S19KC06**	40	40	50,0	250	40,0	–	CN..190612

DCLN 5°

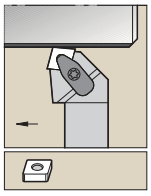


See pages E28–E42, E145, E159, E168–E169 for inserts.

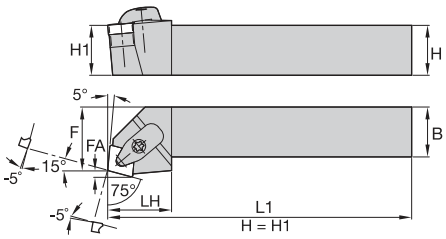


order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5564319	**DCLNR124BKC3**	.75	.75	1.000	4.50	1.25	.15	CN..432
5564321	**DCLNR164DKC3**	1.00	1.00	1.250	6.00	1.25	–	CN..432
5564322	**DCLNR165DKC4**	1.00	1.00	1.250	6.00	1.38	–	CN..543
5564323	**DCLNR166DKC4**	1.00	1.00	1.250	6.00	1.38	–	CN..643
5564324	**DCLNR204DKC3**	1.25	1.25	1.500	6.00	1.25	–	CN..432
5564325	**DCLNR205DKC4**	1.25	1.25	1.500	6.00	1.38	–	CN..543
5564326	**DCLNR206DKC4**	1.25	1.25	1.500	6.00	1.63	–	CN..643
5564333	**DCLNR3225P12KC04**	1.26	.98	1.260	6.69	1.26	–	CN..120408
5564327	**DCLNR244DKC3**	1.50	1.50	2.000	6.00	1.25	–	CN..432
5564328	**DCLNR245DKC4**	1.50	1.50	2.000	6.00	1.38	–	CN..543
left hand								
5564295	**DCLNL123BKC3**	.75	.75	1.000	4.50	1.12	.06	CN..322
5564296	**DCLNL124BKC3**	.75	.75	1.000	4.50	1.25	.15	CN..432
5564298	**DCLNL164DKC3**	1.00	1.00	1.250	6.00	1.25	–	CN..432
5564299	**DCLNL165DKC4**	1.00	1.00	1.250	6.00	1.38	–	CN..543
5564310	**DCLNL166DKC4**	1.00	1.00	1.250	6.00	1.63	–	CN..643
5564311	**DCLNL204DKC3**	1.25	1.25	1.500	6.00	1.25	–	CN..432
5564312	**DCLNL205DKC4**	1.25	1.25	1.500	6.00	1.38	–	CN..543
5564313	**DCLNL206DKC4**	1.25	1.25	1.500	6.00	1.63	–	CN..643
5564331	**DCLNL3225P12KC04**	1.26	.98	1.260	6.69	1.26	–	CN..120408
5564315	**DCLNL244DKC3**	1.50	1.50	2.000	6.00	1.25	–	CN..432
5564316	**DCLNL245DKC4**	1.50	1.50	2.000	6.00	1.38	–	CN..543

DCRN 75°

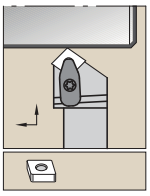


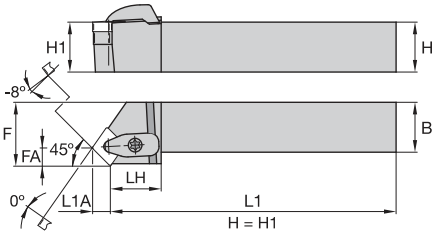
See pages E28–E42, E145, E159, E168–E169 for inserts.



order number	catalogue number	H	B	F	L1	LH	FA	gage insert
right hand								
5697904	**DCRNR2525M12KC04**	25	25	32,0	150	32,0	3,3	CN..120408
left hand								
5697900	**DCRNL2525M12KC04**	25	25	32,0	150	32,0	3,3	CN..120408
5697902	**DCRNL3232P16KC06**	32	32	40,0	170	38,0	4,1	CN..160612

DCSN 45°

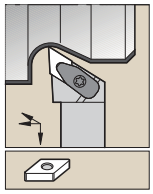


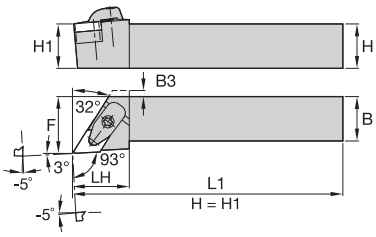


See pages E28–E42, E145, E159, E168–E169 for inserts.

order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert
right hand									
5697913	**DCSNR2525M12KC04**	25	25	32,0	150	35,0	8,2	8,5	CN..120408

DDJN 93°

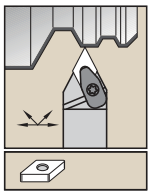


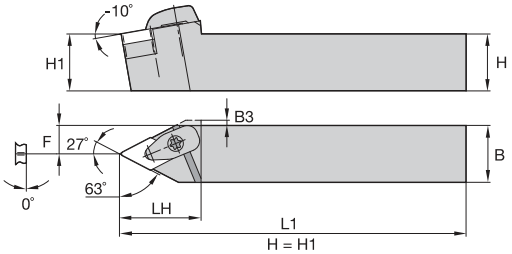


See pages E49–E60, E147, E162, E172–E173 for inserts.

order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5697924	**DDJNR2020K11KC04**	20	20	25,0	125	30,0	2,0	DN..110408
5697926	**DDJNR2020K15KC06**	20	20	25,0	125	32,0	4,0	DN..150608
5697928	**DDJNR2525M11KC04**	25	25	32,0	150	30,0	—	DN..110408
5697930	**DDJNR2525M15KC06**	25	25	32,0	150	32,0	—	DN..150608
5697932	**DDJNR3225P15KC06**	32	25	32,0	170	32,0	—	DN..150608
5564336	**DDJNR3232P15KC06**	32	32	40,0	170	32,0	—	DN..150608
left hand								
5697915	**DDJNL2020K11KC04**	20	20	25,0	125	30,0	2,0	DN..110408
5697916	**DDJNL2020K15KC06**	20	20	25,0	125	32,0	4,0	DN..150608
5697918	**DDJNL2525M11KC04**	25	25	32,0	150	30,0	—	DN..110408
5697920	**DDJNL2525M15KC06**	25	25	32,0	150	32,0	—	DN..150608
5697922	**DDJNL3225P15KC06**	32	25	32,0	170	32,0	—	DN..150608
5564335	**DDJNL3232P15KC06**	32	32	40,0	171	32,0	—	DN..150608

DDNN 63°

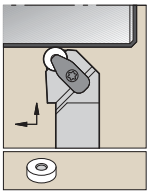


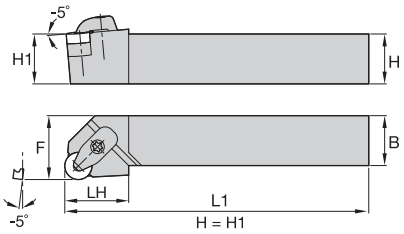


See pages E49–E60, E147, E162, E172–E173 for inserts.

order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5697940	**DDNNR2020K15KC06**	20	20	10,0	125	40,0	2,5	DN..150608
5697942	**DDNNR2525M15KC06**	25	25	13,0	150	40,0	–	DN..150608
left hand								
5697936	**DDNNL2525M15KC06**	25	25	13,0	150	40,0	–	DN..150608
5697938	**DDNNL3225P15KC06**	32	25	13,0	170	40,0	–	DN..150608

DRGN

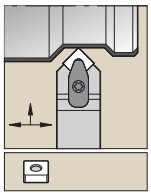


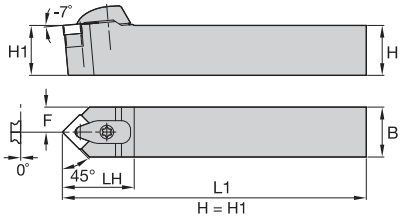


See pages E62–E63 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
5697948	**DRGNR2525M12KC04**	25	25	32,0	150	32,0	RN..120400

DSDN 45°

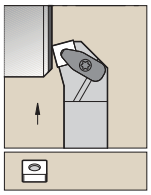


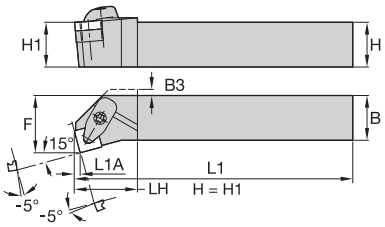


See pages E67–E78, E153, E174 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
neutral hand							
5697954	**DSDNN2020K12KC04**	20	20	10,0	125	36,0	SN..120408
5697955	**DSDNN2525M12KC04**	25	25	12,0	150	36,0	SN..120408
5697959	**DSDNN3225P12KC04**	32	25	12,0	170	36,0	SN..120408
5697961	**DSDNN3232P19KC06**	32	32	15,5	170	44,0	SN..190612
5697963	**DSDNN4040S25KC09**	40	40	19,5	250	59,0	SN..250924

DSKN 75°

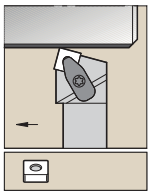


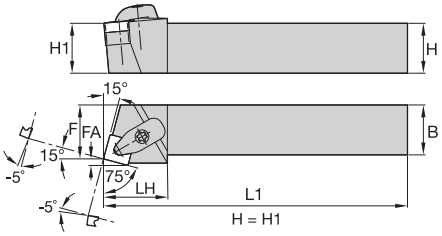


See pages E67–E78, E153, E174 for inserts.

order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert
right hand									
5696686	**DSKNR2525M12KC04**	25	25	32,0	150	32,0	3,1	4,0	SN..120408
5696688	**DSKNR3232P15KC06**	32	32	40,0	170	32,0	3,8	–	SN..150612

DSRN 75°

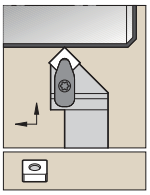


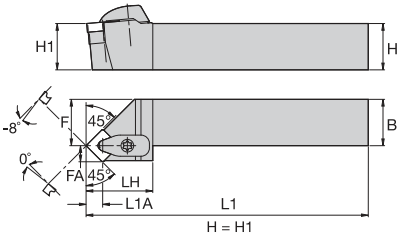


See pages E67–E78, E153, E174 for inserts.

order number	catalogue number	H	B	F	L1	LH	FA	gage insert
right hand								
5696704	**DSRNR2525M12KC04**	25	25	27,0	150	32,0	3,3	SN..120408
5696706	**DSRNR3232P19KC06**	32	32	35,0	170	42,0	4,8	SN..190612
left hand								
5696700	**DSRNL2525M12KC04**	25	25	27,0	150	32,0	3,3	SN..120408
5696701	**DSRNL3232P15KC06**	32	32	35,0	170	38,0	4,0	SN..150612

DSSN 45°

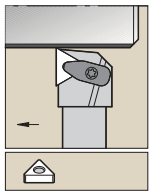


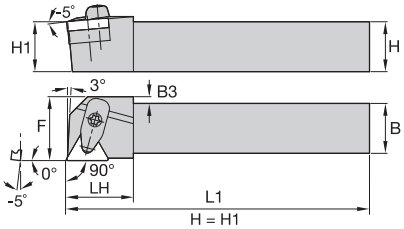


See pages E67–E78, E153, E174 for inserts.

order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert
right hand									
5696713	**DSSNR2020K12KC04**	20	20	25,0	125	36,0	8,4	8,7	SN..120408
5696714	**DSSNR2525M12KC04**	25	25	32,0	150	36,0	8,4	8,7	SN..120408
5696718	**DSSNR3232P19KC06**	32	32	40,0	170	44,0	12,7	10,7	SN..190612

DTGN 90°

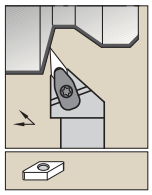


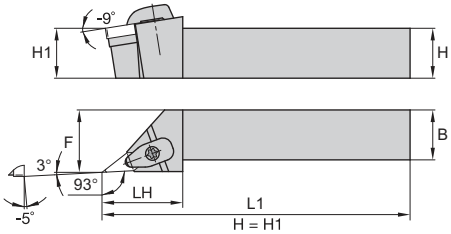


See pages E86–E95, E155, E164, E175 for inserts.

order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5696729	**DTGNR2020K16KC04**	20	20	25,0	125	25,0	6,5	TN..160408
5696730	**DTGNR2525M16KC04**	25	25	32,0	150	25,0	–	TN..160408
left hand								
5696728	**DTGNL2525M16KC04**	25	25	32,0	150	25,0	–	TN..160408

DVJN 93°

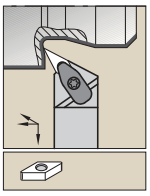


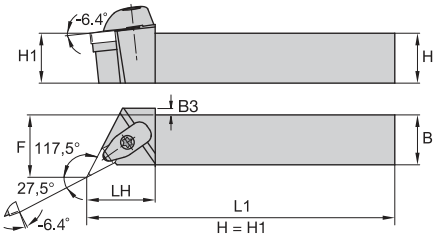


See pages E102–E108, E157, E166, E177 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
5696737	**DVJNR2020K16KC04**	20	20	25,0	125	46,0	VN..160408
5696738	**DVJNR2525M16KC04**	25	25	32,0	150	46,0	VN..160408
5696740	**DVJNR3225P16KC04**	32	25	32,0	170	46,0	VN..160408
left hand							
5696732	**DVJNL2020K16KC04**	20	20	25,0	125	46,0	VN..160408
5696733	**DVJNL2525M16KC04**	25	25	32,0	150	46,0	VN..160408
5696735	**DVJNL3225P16KC04**	32	25	32,0	170	46,0	VN..160408

DVON 117,5°

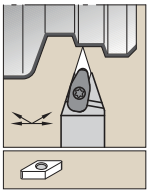


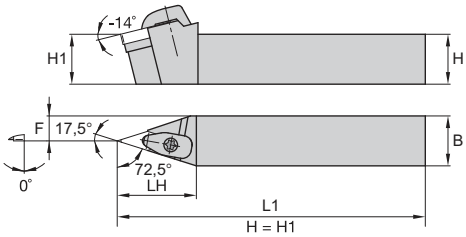


See pages E102–E108, E157, E166, E177 for inserts.

order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5696745	**DVONR2020K16KC04**	20	20	27,0	125	38,0	5,0	VN..160408
5696746	**DVONR2525M16KC04**	25	25	32,0	150	38,0	—	VN..160408
5696747	**DVONR3225P16KC04**	32	25	9,5	170	38,0	—	VN..160408
left hand								
5696742	**DVONL2020K16KC04**	20	20	27,0	125	38,0	5,0	VN..160408
5696743	**DVONL2525M16KC04**	25	25	32,0	150	38,0	—	VN..160408

DVVN 72,5°

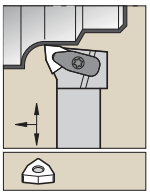




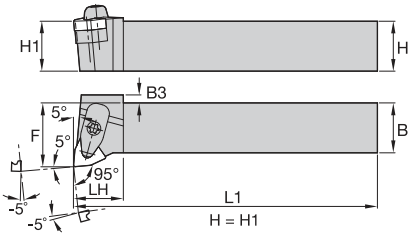
See pages E102–E108, E157, E166, E177 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
neutral hand							
5696748	**DVVNN2020K16KC04**	20	20	10,0	125	48,0	VN..160408
5696749	**DVVNN2525M16KC04**	25	25	12,0	150	48,0	VN..160408
5696750	**DVVNN3225P16KC04**	32	25	12,0	170	48,0	VN..160408

DWLN 95°

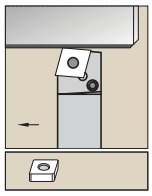


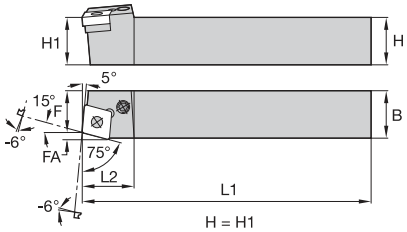
See pages E108–E116, E157, E167, E177 for inserts.



order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5696757	**DWLNR2020K06KC04**	20	20	25,0	125	31,0	—	WN..060408
5696758	**DWLNR2020K08KC04**	20	20	25,0	125	33,0	—	WN..080408
5696759	**DWLNR2525M06KC04**	25	25	32,0	150	25,0	—	WN..060408
5696760	**DWLNR2525M08KC04**	25	25	32,0	150	25,0	4,0	WN..080408
5696762	**DWLNR3232P08KC04**	32	32	40,0	170	25,0	—	WN..080408
left hand								
5696751	**DWLNL2020K06KC04**	20	20	25,0	125	31,0	—	WN..060408
5696752	**DWLNL2020K08KC04**	20	20	25,0	125	33,0	—	WN..080408
5696753	**DWLNL2525M06KC04**	25	25	32,0	150	25,0	—	WN..060408
5696754	**DWLNL2525M08KC04**	25	25	32,0	150	25,0	4,0	WN..080408
5696756	**DWLNL3232P08KC04**	32	32	40,0	170	25,0	—	WN..080408

PCBN 75°

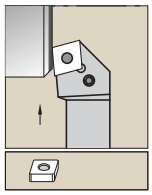


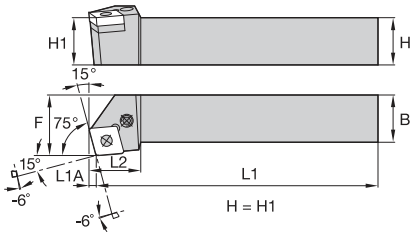


See pages E28–E42, E145, E159, E168–E169 for inserts.

order number	catalogue number	H	B	F	L1	L2	FA	gage insert
right hand								
3878356	**PCBNR2525M12**	25	25	22,0	150	26,0	3,1	CN..120408
3878366	**PCBNR2525M16**	25	25	22,0	150	26,0	4,2	CN..160612
left hand								
3878360	**PCBNL2020K12**	20	20	17,0	125	26,0	3,1	CN..120408
3878354	**PCBNL2525M12**	25	25	22,0	150	26,0	3,1	CN..120408
3878365	**PCBNL2525M16**	25	25	22,0	150	26,0	4,2	CN..160612
3878355	**PCBNL3232P16**	32	32	27,0	170	38,0	4,2	CN..160612
3878357	**PCBNL3232P19**	32	32	27,0	170	40,0	4,6	CN..190612

PCKN 75°

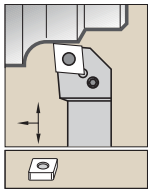


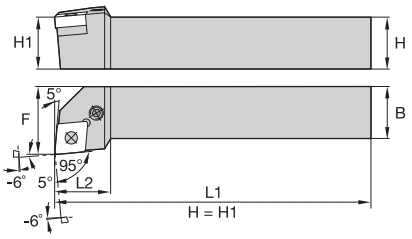


See pages E28–E42, E145, E159, E168–E169 for inserts.

order number	catalogue number	H	B	F	L1	L2	L1A	gage insert
right hand								
3878372	**PCKNR2020K12**	20	20	25,0	125	23,0	3,1	CN..120408
3878370	**PCKNR2525M12**	25	25	32,0	150	23,0	3,1	CN..120408
3878374	**PCKNR2525M16**	25	25	32,0	150	30,0	3,8	CN..160612
3899889	**PCKNR3232P16**	32	32	40,0	170	38,0	3,8	CN..160612
left hand								
3878373	**PCKNL2020K12**	20	20	25,0	125	23,0	3,1	CN..120408
3878369	**PCKNL2525M12**	25	25	32,0	150	23,0	3,1	CN..120408
3878377	**PCKNL2525M16**	25	25	32,0	150	30,0	3,8	CN..160612
3899888	**PCKNL3232P16**	32	32	40,0	170	38,0	3,8	CN..160612
3878368	**PCKNL3232P19**	32	32	40,0	170	40,0	4,6	CN..190612

PCLN 95°

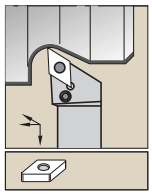


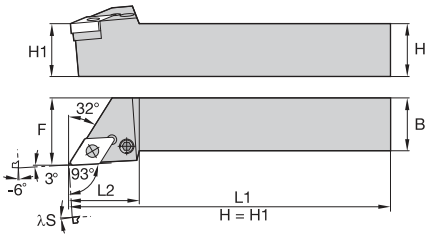


See pages E28–E42, E145, E159, E168–E169 for inserts.

order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3878400	**PCLNR1616H12**	16	16	20,0	100	26,0	CN..120408
3878422	**PCLNR2020K12**	20	20	25,0	125	26,0	CN..120408
3878419	**PCLNR2525M12**	25	25	32,0	150	26,0	CN..120408
3878401	**PCLNR2525M16**	25	25	32,0	150	28,0	CN..160612
3878402	**PCLNR3225P12**	32	25	32,0	170	26,0	CN..120408
3878421	**PCLNR3225P16**	32	25	32,0	170	38,0	CN..160612
3878396	**PCLNR3232P16**	32	32	40,0	170	36,0	CN..160612
3878414	**PCLNR3232P19**	32	32	40,0	170	36,0	CN..190612
3878417	**PCLNR4040S19**	40	40	50,0	250	36,0	CN..190612
left hand							
3878379	**PCLNL1616H12**	16	16	20,0	100	26,0	CN..120408
3878418	**PCLNL2020K12**	20	20	25,0	125	26,0	CN..120408
3878398	**PCLNL2525M12**	25	25	32,0	150	26,0	CN..120408
3878380	**PCLNL2525M16**	25	25	32,0	150	28,0	CN..160612
3878397	**PCLNL3225P12**	32	25	32,0	170	26,0	CN..120408
3878415	**PCLNL3232P16**	32	32	40,0	170	36,0	CN..160612
3878393	**PCLNL3232P19**	32	32	40,0	170	36,0	CN..190612
3878416	**PCLNL4040S19**	40	40	50,0	250	36,0	CN..190612

PDJN 93°

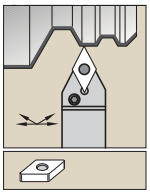




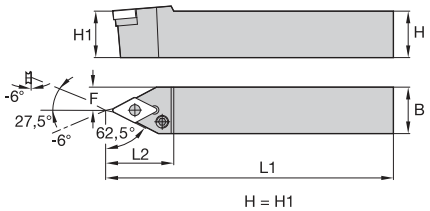
See pages E49–E60, E147, E162, E172–E173 for inserts.

order number	catalogue number	H	B	F	L1	L2	λS°	gage insert
right hand								
3878424	**PDJNR1616H11**	16	16	20,0	100	22,0	-6.0	DN..110408
3878429	**PDJNR2020K11**	20	20	25,0	125	30,0	-7.0	DN..110408
3879318	**PDJNR2020K15**	20	20	25,0	125	36,0	-7.0	DN..150608
3879151	**PDJNR2525M11**	25	25	32,0	150	30,0	-7.0	DN..110408
3878425	**PDJNR3225P15**	32	25	32,0	170	38,0	-7.0	DN..150608
3879152	**PDJNR3232P15**	32	32	40,0	170	38,0	-7.0	DN..150608
3878426	**PDJNR4025R15**	40	25	32,0	200	38,0	-7.0	DN..150608
left hand								
3878427	**PDJNL2020K11**	20	20	25,0	125	30,0	-7.0	DN..110408
3879317	**PDJNL2020K15**	20	20	25,0	125	36,0	-7.0	DN..150608
3878428	**PDJNL2525M11**	25	25	32,0	150	30,0	-7.0	DN..110408
3879314	**PDJNL2525M15**	25	25	32,0	150	—	-7.0	DN..150608
3878423	**PDJNL3225P15**	32	25	32,0	170	38,0	-7.0	DN..150608
3879315	**PDJNL3232P15**	32	32	40,0	170	38,0	-7.0	DN..150608

PDNN 62,5°

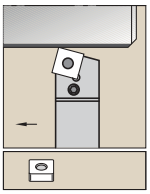


See pages E49–E60, E147, E162, E172–E173 for inserts.

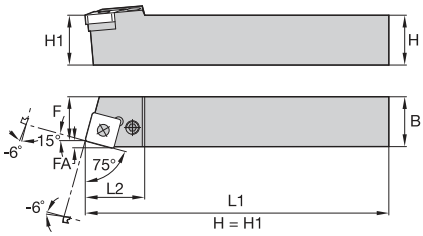


order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879319	**PDNNR2525M15**	25	25	12,5	150	36,0	DN..150608
left hand							
3879320	**PDNNL2525M15**	25	25	12,5	150	36,0	DN..150608

PSBN 75°

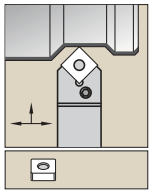


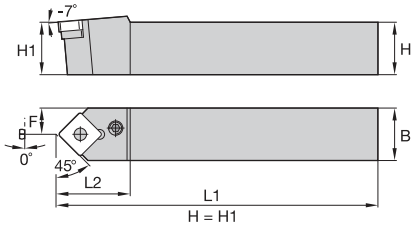
See pages E67–E78, E153, E174 for inserts.



order number	catalogue number	H	B	F	L1	L2	FA	gage insert
right hand								
3879324	**PSBNR2020K12**	20	20	17,0	125	26,0	3,1	SN..120408
3879327	**PSBNR3232P19**	32	32	27,0	170	40,0	4,6	SN..190612
3879334	**PSBNR4040S19**	40	40	35,0	250	38,0	4,6	SN..190612
3879331	**PSBNR4040S25**	40	40	35,0	250	47,0	5,9	SN..250724
left hand								
3879329	**PSBNL2525M15**	25	25	22,0	150	36,0	3,8	SN..150612
3879328	**PSBNL3232P19**	32	32	27,0	170	40,0	4,6	SN..190612
3879323	**PSBNL4040S19**	40	40	35,0	250	38,0	4,6	SN..190612
3879326	**PSBNL4040S25**	40	40	35,0	250	47,0	5,9	SN..250724
3900159	**PSBNL5050T25**	50	50	43,0	300	50,0	—	SN..250724

PSDN 45°

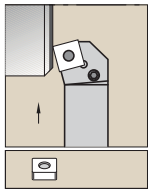


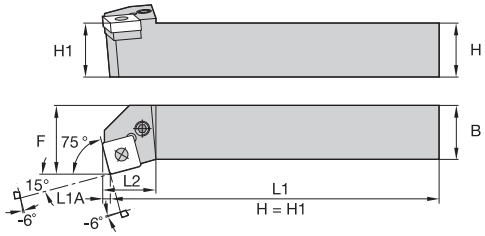


See pages E67–E78, E153, E174 for inserts.

order number	catalogue number	H	B	F	L1	L2	gage insert
neutral hand							
3879335	**PSDNN2020K12**	20	20	10,0	125	26,0	SN..120408
3879337	**PSDNN2525M12**	25	25	12,5	150	26,0	SN..120408
3900161	**PSDNN3232P15**	32	32	16,0	170	33,0	SN..150612
3879338	**PSDNN4040S25**	40	40	20,0	250	47,0	SN..250724

PSKN 75°

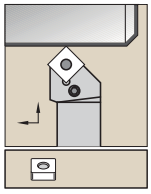




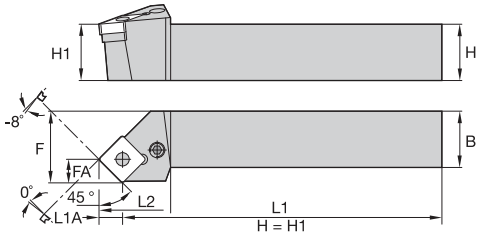
See pages E67–E78, E153, E174 for inserts.

order number	catalogue number	H	B	F	L1	L2	L1A	gage insert
right hand								
3879340	**PSKNR2020K12**	20	20	25,0	125	23,0	3,1	SN..120408
3879341	**PSKNR2525M12**	25	25	32,0	150	23,0	3,1	SN..120408
3879710	**PSKNR4040S19**	40	40	50,0	250	37,5	4,6	SN..190612
left hand								
3879345	**PSKNL4040S19**	40	40	50,0	250	37,5	4,6	SN..190612

PSSN 45°

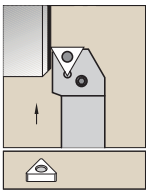


See pages E67–E78, E153, E174 for inserts.

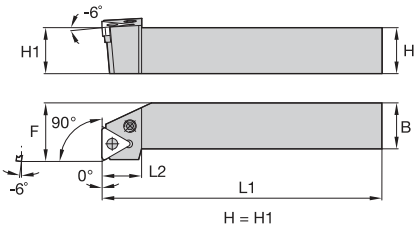


order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert
right hand									
3879351	**PSSNR1616H09**	16	16	20,0	100	23,0	6,1	6,1	SN..090308
3879348	**PSSNR2020K12**	20	20	25,0	125	28,0	8,3	9,6	SN..120408
3879352	**PSSNR2525M12**	25	25	32,0	150	28,0	8,3	9,6	SN..120408
3879349	**PSSNR2525M15**	25	25	32,0	150	32,0	10,2	10,2	SN..150612
3879360	**PSSNR3225P12**	32	25	32,0	170	29,0	8,3	9,6	SN..120408
3879362	**PSSNR3225P15**	32	25	32,0	170	32,0	10,2	10,2	SN..150612
3879354	**PSSNR3232P15**	32	32	40,0	170	32,0	10,0	11,5	SN..150612
3879350	**PSSNR3232P19**	32	32	40,0	170	37,5	12,5	13,7	SN..190612
3879361	**PSSNR4040S19**	40	40	50,0	250	37,5	12,5	12,5	SN..190612
left hand									
3879347	**PSSNL2020K12**	20	20	25,0	125	28,0	8,3	9,6	SN..120408
3879353	**PSSNL2525M12**	25	25	32,0	150	28,0	8,3	9,6	SN..120408
3879358	**PSSNL3225P12**	32	25	32,0	170	29,0	8,3	9,6	SN..120408
3879356	**PSSNL3232P19**	32	32	40,0	170	37,5	12,5	13,7	SN..190612
3879357	**PSSNL4040S19**	40	40	50,0	250	37,5	12,5	12,5	SN..190612
3879711	**PSSNL4040S25**	40	40	50,0	250	50,0	16,0	16,0	SN..250724

PTFN 90°

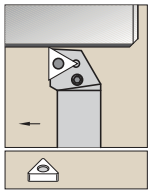


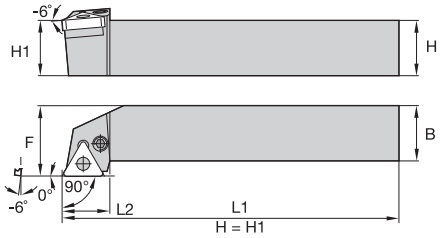
See pages E86–E95, E155, E164, E175 for inserts.



order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879367	**PTFNR2020K16**	20	20	25,0	125	20,0	TN..160408
left hand							
3879366	**PTFNL2020K16**	20	20	25,0	125	20,0	TN..160408

PTGN 90°

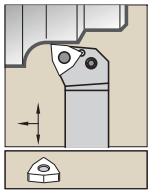


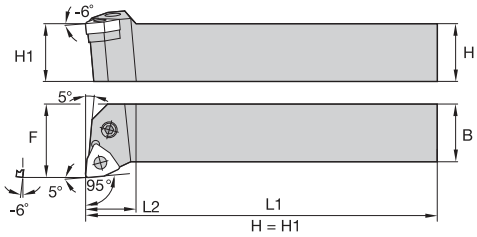


See pages E86–E95, E155, E164, E175 for inserts.

order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879385	**PTGNR1616H16**	16	16	20,0	100	20,0	TN..160408
3879389	**PTGNR2020K16**	20	20	25,0	125	20,0	TN..160408
3879390	**PTGNR2525M16**	25	25	32,0	150	20,0	TN..160408
3879387	**PTGNR2525M22**	25	25	32,0	150	26,0	TN..220408
3879846	**PTGNR3225P22**	32	25	32,0	170	28,0	TN..220408
3900163	**PTGNR4040T27**	40	40	50,0	300	31,0	TN..270612
left hand							
3879388	**PTGNL2525M16**	25	25	32,0	150	20,0	TN..160408
3879386	**PTGNL2525M22**	25	25	32,0	150	26,0	TN..220408
3879392	**PTGNL3232P22**	32	32	40,0	170	26,0	TN..220408
3900162	**PTGNL4040T27**	40	40	50,0	300	31,0	TN..270612

PWLN 95°

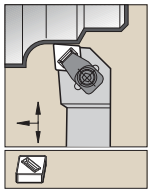




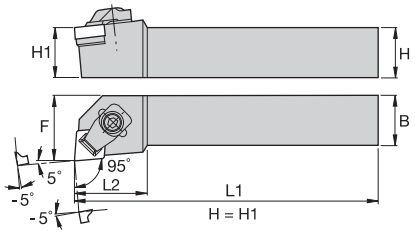
See pages E108–E116, E157, E167, E177 for inserts.

order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879405	**PWLNR1616H06**	16	16	20,0	100	14,0	WN..060408
3879407	**PWLNR2020K06**	20	20	25,0	125	14,0	WN..060408
3879408	**PWLNR2020K08**	20	20	25,0	125	20,0	WN..080408
3900167	**PWLNR2525M06**	25	25	32,0	150	20,0	WN..060408
3879409	**PWLNR2525M08**	25	25	32,0	150	26,0	WN..080408
3900164	**PWLNR3232P08**	32	32	40,0	170	26,0	WN..080408
left hand							
3879403	**PWLNL2020K08**	20	20	25,0	125	20,0	WN..080408
3900166	**PWLNL2525M06**	25	25	32,0	150	20,0	WN..060408
3879404	**PWLNL2525M08**	25	25	32,0	150	26,0	WN..080408
3900165	**PWLNL3232P08**	32	32	40,0	170	26,0	WN..080408

CCLN-MX 95°



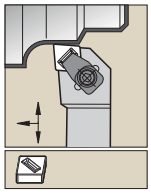
See page E146 for inserts.



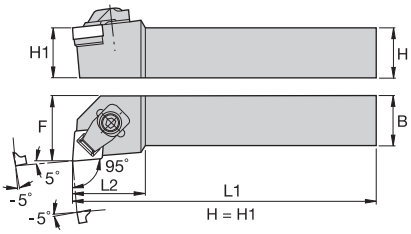
order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3032691	**CCLNR2525M12MX7**	25	25	32,0	150	32,0	CN.X120708

NOTE: MX — clamping version is shown.

CCLN-MN 95°



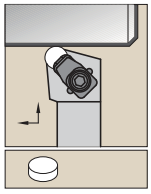
See page E146 for inserts.



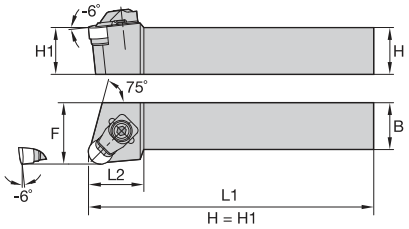
order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3032715	**CCLNR2525M12MN4**	25	25	32,0	150	32,0	CN.N120408

NOTE: MX — clamping version is shown.

CRSN-MN



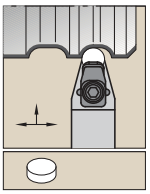
See pages E150, E173 for inserts.



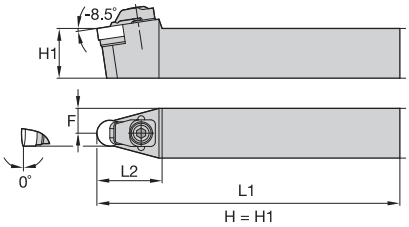
order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3032677	**CRSNR2525M12MN7**	25	25	32,0	150	26,0	RN.N120700
3032675	**CRSNR3225P12MN4**	32	25	32,0	170	26,0	RN.N120400
left hand							
3032676	**CRSNL3225P12MN4**	32	25	32,0	170	26,0	RN.N120400
3032680	**CRSNL3225P12MN7**	32	25	32,0	170	26,0	RN.N120700

NOTE: MN — clamping version is shown.

CRDN-MN



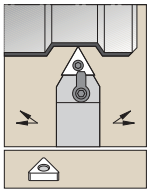
See pages E150, E173 for inserts.



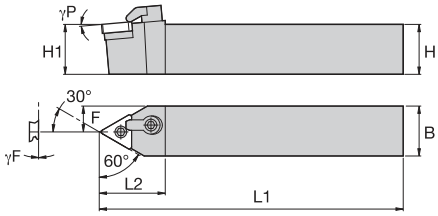
order number	catalogue number	H	B	F	L1	L2	gage insert
neutral hand							
3032549	**CRDNN2525M12MN4**	25	25	12,5	150	30,0	RN.N120400
3032551	**CRDNN2525M12MN7**	25	25	12,5	150	30,0	RN.N120700
3032550	**CRDNN3225P12MN4**	32	25	12,5	170	30,0	RN.N120400
3032552	**CRDNN3225P12MN7**	32	25	12,5	170	30,0	RN.N120700

NOTE: MN — clamping version is shown.

MTEN-S 60°



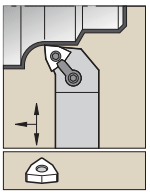
See pages E86-E95, E155, E164, E175 for inserts.



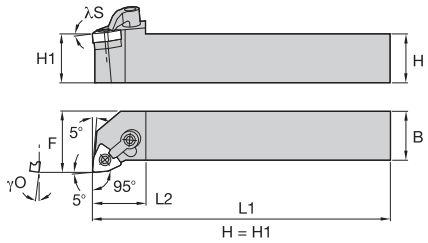
NOTE: H = H1

order number	catalogue number	H	B	F	L1	L2	γF°	γP°	gage insert
neutral hand									
3852753	**MTENNS3225P22**	32	25	12,3	170	35,0	0.0	-10.0	TN..220408

MWLN 95°

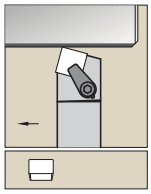


See pages E108–E116, E157, E167, E177 for inserts.

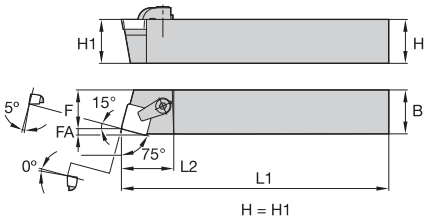


order number	catalogue number	H	B	F	L1	λS°	γO°	gage insert
left hand								
2023778	**MWLNL3232P08**	32	32	40,0	170	-5	-5	WN..0804..

CSBP 75°

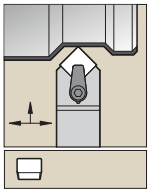


See pages E79, E81–E82, E154 for inserts.

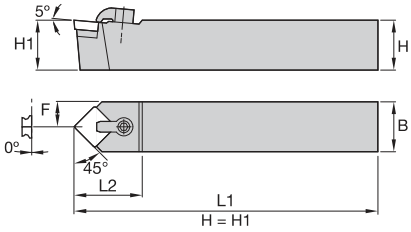


order number	catalogue number	H	B	F	L1	L2	FA	gage insert
right hand								
3870069	**CSBPR2525M12**	25	25	22,0	150	30,0	3,1	SP..120308

CSDP 45°

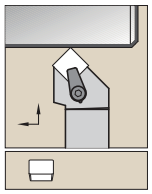


See pages E79, E81–E82, E154 for inserts.

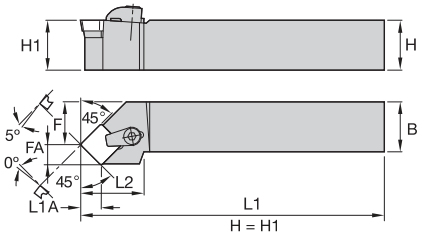


order number	catalogue number	H	B	F	L1	L2	gage insert
neutral hand							
3870071	**CSDPN2020K12**	20	20	10,0	125	32,0	SP..120308
3870072	**CSDPN2525M12**	25	25	12,5	150	32,0	SP..120308

CSSP 45°

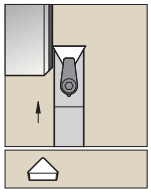


See pages E79, E81–E82, E154 for inserts.

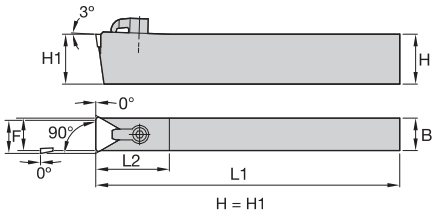


order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert
right hand									
3870074	**CSSPR2020K12**	20	20	25,0	125	32,0	8,7	8,3	SP..120308

CTCPN 90°

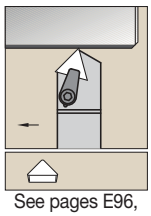


See pages E96, E98, E165 for inserts.

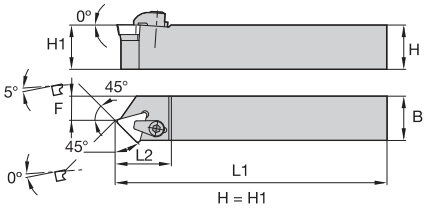


order number	catalogue number	H	B	F	L1	L2	gage insert
neutral hand							
3870076	**CTCPN2510M11**	25	10	10,0	150	26,0	TP..110304

CTDP 45°

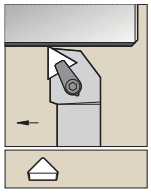


See pages E96, E98, E165 for inserts.

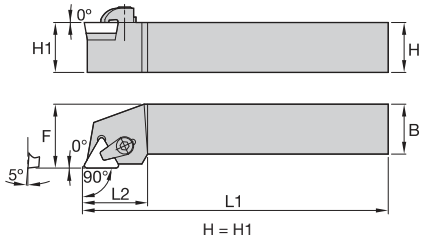


order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3870083	**CTDPR1212F11**	12	12	6,0	80	22,0	TP..110304

CTGP 90°

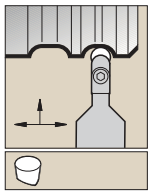


See pages E96, E98, E165 for inserts.

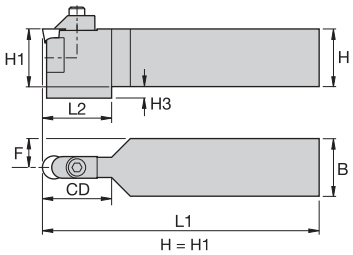


order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3870092	**CTGPR1212F11**	12	12	16,0	80	20,0	TP..110304
3870104	**CTGPR2020K11**	20	20	25,0	125	20,0	TP..110304
3870105	**CTGPR2020K16**	20	20	25,0	125	26,0	TP..160308
3870106	**CTGPR2525M16**	25	25	32,0	150	26,0	TP..160308

CRDP



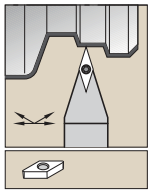
See page E151 for inserts.



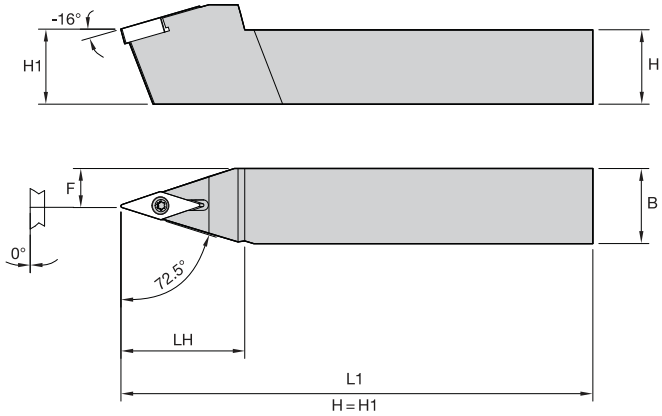
order number	catalogue number	H	B	F	L1	L2	H3	CD	gage insert
neutral hand									
3871510	**CRDPN2525M06V**	25	25	12,5	150	—	—	19,0	R..X060400E
3871511	**CRDPN2525M09V**	25	25	12,5	150	—	—	29,0	R..X090700E
3871513	**CRDPN2525M12V**	25	25	12,5	150	38,1	6,4	38,0	R..X120700E

NOTE: CRDP toolholders are able to use RPGX and RCGX insert styles.

SVVN 72.5°

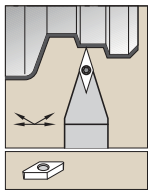


See pages E67–E78, E153, E174 for inserts.

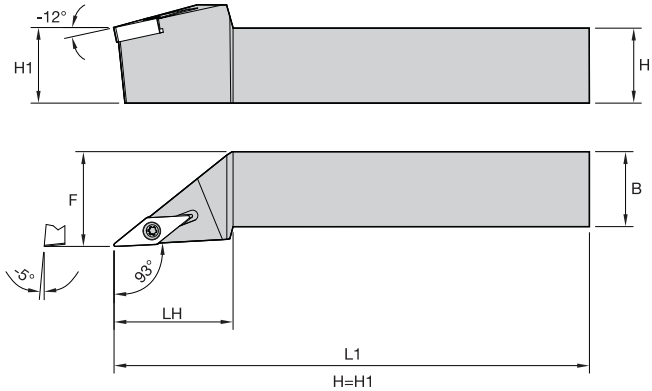


order number	catalogue number	H	B	F	L1	γF°	γP°	gage insert
neutral hand								
2552265	**SVVNN2020K12**	.79	.79	.394	4.92	0.0	-16.0	VNM..12T304
2552264	**SVVNN2525M12**	.98	.98	.492	5.91	0.0	-16.0	VNM..12T304

SVJN 93°

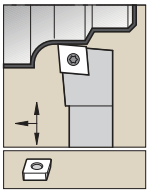


See pages E67–E78, E153, E174 for inserts.

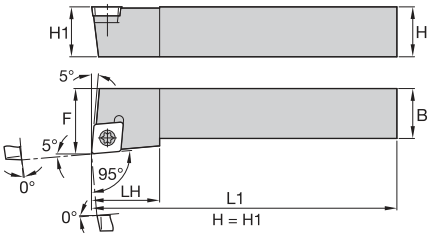


order number	catalogue number	H	B	F	L1	γF°	γP°	gage insert
right hand								
2552272	**SVJNR1616H12**	.63	.63	.787	3.94	-5.0	-12.0	VNM..12T304
2552270	**SVJNR2020K12**	.79	.79	.984	4.92	-5.0	-12.0	VNM..12T304
2552268	**SVJNR2525M12**	.98	.98	1.260	5.91	-5.0	-12.0	VNM..12T304
left hand								
2552269	**SVJNL2020K12**	.79	.79	.984	4.92	-5.0	-12.0	VNM..12T304
2552267	**SVJNL2525M12**	.98	.98	1.260	5.91	-5.0	-12.0	VNM..12T304

SCLC 95°

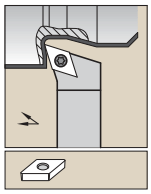


See pages E22–E27, E122, E158, E167–E168 for inserts.

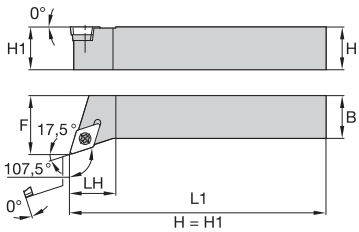


order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3900169	**SCLCR1010E06**	10	10	12,0	70	—	CC..060204
3900172	**SCLCR1212F06**	12	12	16,0	80	—	CC..060204
3900170	**SCLCR1212F09**	12	12	16,0	80	—	CC..09T308
3879416	**SCLCR1616H09**	16	16	20,0	100	15,8	CC..09T308
3879417	**SCLCR2020K09**	20	20	25,0	125	15,8	CC..09T308
3879414	**SCLCR2020K12**	20	20	25,0	125	19,8	CC..120408
3879418	**SCLCR2525M12**	25	25	32,0	150	20,0	CC..120408
left hand							
3900171	**SCLCL1010E06**	10	10	12,0	70	—	CC..060204
3900168	**SCLCL1212F09**	12	12	16,0	80	16,0	CC..09T308
3879411	**SCLCL1616H09**	16	16	20,0	100	15,8	CC..09T308
3879412	**SCLCL2020K09**	20	20	25,0	125	15,8	CC..09T308
3879415	**SCLCL2020K12**	20	20	25,0	125	19,8	CC..120408
3879413	**SCLCL2525M12**	25	25	32,0	150	20,0	CC..120408

SDHC 107,5°

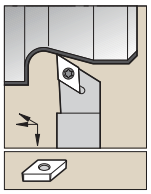


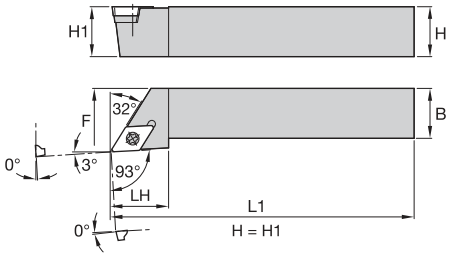
See pages E44–E48, E123, E161, E170–E171 for inserts.



order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879435	**SDHCR1616H11**	16	16	20,0	100	20,0	DC..11T308
3879437	**SDHCR2020K11**	20	20	25,0	125	20,0	DC..11T308
3879440	**SDHCR2525M11**	25	25	32,0	150	20,0	DC..11T308
3879436	**SDHCR2525M15**	25	25	32,0	150	25,0	DC..150408
left hand							
3879433	**SDHCL1616H11**	16	16	20,0	100	20,0	DC..11T308
3879439	**SDHCL2020K11**	20	20	25,0	125	20,0	DC..11T308
3879438	**SDHCL2525M11**	25	25	32,0	150	20,0	DC..11T308
3879434	**SDHCL2525M15**	25	25	32,0	150	25,0	DC..150408

SDJC 93°

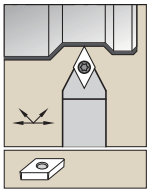


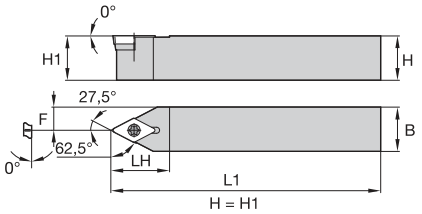


See pages E44–E48, E123, E161, E170–E171 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879464	**SDJCR1010M07**	10	10	12,0	150	16,0	DC..070204
3899890	**SDJCR1212F07**	12	12	16,0	80	–	DC..070204
3900177	**SDJCR1212F11**	12	12	16,0	80	–	DC..11T308
3879456	**SDJCR1616H07**	16	16	20,0	100	16,0	DC..070204
3879459	**SDJCR1616H11**	16	16	20,0	100	22,0	DC..11T308
3879458	**SDJCR2020K07**	20	20	25,0	125	16,0	DC..070204
3879460	**SDJCR2020K11**	20	20	25,0	125	22,0	DC..11T308
3879457	**SDJCR2020K15**	20	20	25,0	125	32,0	DC..150408
3879461	**SDJCR2525M11**	25	25	32,0	150	22,1	DC..11T308
3879463	**SDJCR2525M15**	25	25	32,0	150	32,0	DC..150408
3900175	**SDJCR3225P15**	32	25	32,0	170	–	DC..150408
left hand							
3899892	**SDJCL1010E07**	10	10	12,0	70	–	DC..070204
3899891	**SDJCL1212F07**	12	12	16,0	80	–	DC..070204
3900176	**SDJCL1212F11**	12	12	16,0	80	–	DC..11T308
2024450	**SDJCL1616H11**	16	16	20,0	100	–	DC..11T3..
3879454	**SDJCL1616H11**	16	16	20,0	100	22,0	DC..11T308
3879442	**SDJCL2020K07**	20	20	25,0	125	16,0	DC..070204
3879462	**SDJCL2020K11**	20	20	25,0	125	22,0	DC..11T308
3879453	**SDJCL2525M11**	25	25	32,0	150	22,1	DC..11T308
3879455	**SDJCL2525M15**	25	25	32,0	150	32,0	DC..150408
3900174	**SDJCL3225P15**	32	25	32,0	170	–	DC..150408

SDNC 62,5°

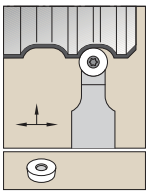


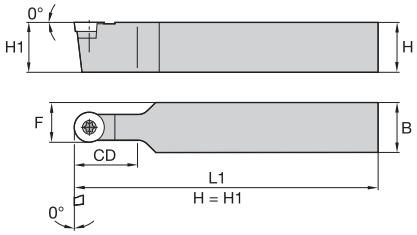


See pages E44–E48, E123, E161, E170–E171 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
neutral hand							
3879468	**SDNCN0808L07**	8	8	4,0	140	16,0	DC..070204
3900178	**SDNCN1212F11**	12	12	6,0	80	–	DC..11T308
3879465	**SDNCN1616H11**	16	16	8,0	100	22,0	DC..11T308
3879467	**SDNCN2020K11**	20	20	10,0	125	22,0	DC..11T308
3879849	**SDNCN2525M11**	25	25	12,5	150	24,9	DC..11T308
3879466	**SDNCN2525M15**	25	25	12,5	150	28,0	DC..150408
3900179	**SDNCN3225P15**	32	25	12,5	170	–	DC..150408

SRDC

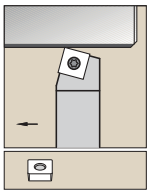


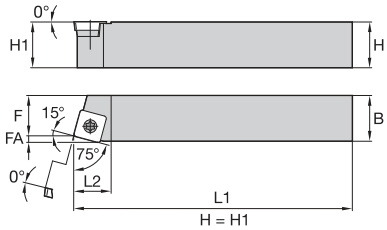


See pages E61–E62, E123 for inserts.

order number	catalogue number	H	B	F	L1	CD	gage insert
neutral hand							
3879735	**SRDCN1616H06**	16	16	11,0	100	16,0	RC..0602M0
3879702	**SRDCN1616H08**	16	16	12,0	100	16,0	RC..0803M0
3900182	**SRDCN2020K06**	20	20	12,5	125	19,7	RC..0602M0
3879733	**SRDCN2020K08**	20	20	14,0	125	20,0	RC..0803M0
3879736	**SRDCN2020K10**	20	20	15,0	125	20,0	RC..10T3M0
3900183	**SRDCN2525M06**	25	25	15,0	150	19,7	RC..0602M0
3879737	**SRDCN2525M08**	25	25	16,5	150	25,0	RC..0803M0
3879734	**SRDCN2525M10**	25	25	17,5	150	25,0	RC..10T3M0
3879738	**SRDCN2525M12**	25	25	18,5	150	25,0	RC..1204M0
3900181	**SRDCN3225P12**	32	25	8,0	170	28,0	RC..1204M0
3900180	**SRDCN3225P16**	32	25	20,0	170	35,0	RC..1605M0

SSBC 75°

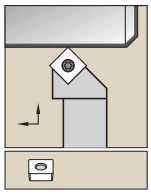




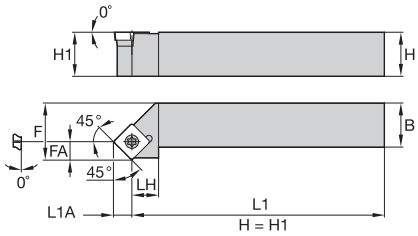
See pages E64–E67 for inserts.

order number	catalogue number	H	B	F	L1	L2	FA	gage insert
right hand								
3879741	**SSBCR2020K12**	20	20	17,0	125	—	3,1	SC..120408
3879740	**SSBCR2525M12**	25	25	22,0	150	21,0	3,1	SC..120408
left hand								
3879739	**SSBCL1616H09**	16	16	13,0	100	16,0	2,2	SC..09T308
3879852	**SSBCL2020K12**	20	20	17,0	125	—	3,1	SC..120408

SSSC 45°

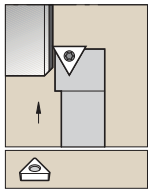


See pages E64–E67 for inserts.

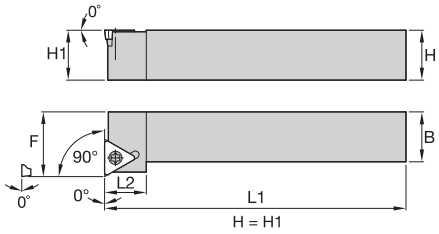


order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert
right hand									
3879747	**SSSCR1616H09**	16	16	20,0	100	18,0	6,1	6,1	SC..09T308
3879746	**SSSCR2020K12**	20	20	25,0	125	25,0	8,3	8,3	SC..120408
3879744	**SSSCR2525M12**	25	25	32,0	150	25,0	8,3	8,3	SC..120408
left hand									
3879742	**SSSCL2525M12**	25	25	32,0	150	25,0	8,3	8,3	SC..120408

STFC 90°

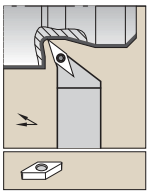


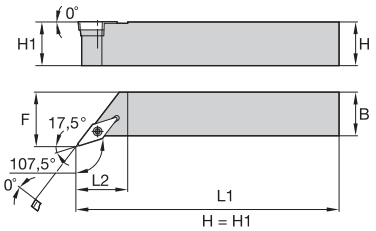
See pages E83–E85, E124, E163–E164, E175 for inserts.



order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879763	**STFCR2020K16**	20	20	25,0	125	20,0	TC..16T308
3879750	**STFCR2525M16**	25	25	32,0	150	20,0	TC..16T308
left hand							
3879752	**STFCL2525M16**	25	25	32,0	150	20,0	TC..16T308

SVHB 107,5°

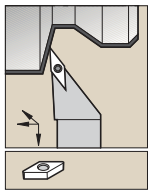


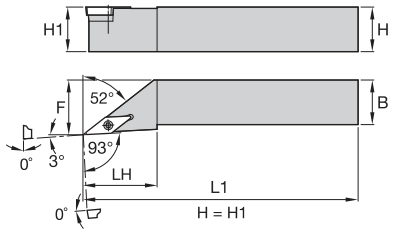


See pages E99–E101, E125, E166, E176 for inserts.

order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879767	**SVHBR2020K16**	20	20	25,0	125	28,0	VB..160408
3879765	**SVHBR2525M16**	25	25	32,0	150	28,0	VB..160408
3879853	**SVHBR3225P16**	32	25	32,0	170	25,0	VB..160408
left hand							
3879764	**SVHBL2020K16**	20	20	25,0	125	28,0	VB..160408
3879766	**SVHBL2525M16**	25	25	32,0	150	28,0	VB..160408
3879768	**SVHBL3225P16**	32	25	32,0	170	25,0	VB..160408

SVJB 93°

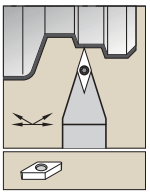


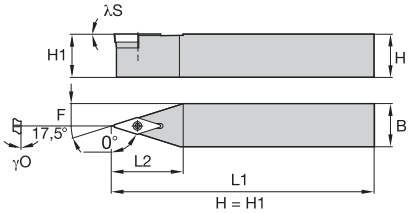


See pages E99–E101, E125, E166, E176 for inserts.

order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879769	**SVJBR1616H16**	16	16	20,0	100	35,0	VB..160408
3879776	**SVJBR2020K16**	20	20	25,0	125	35,0	VB..160408
3879775	**SVJBR2525M16**	25	25	32,0	150	35,0	VB..160408
3879773	**SVJBR3225P16**	32	25	32,0	170	35,0	VB..160408
left hand							
3879772	**SVJBL1616H16**	16	16	20,0	100	35,0	VB..160408
3879770	**SVJBL2020K16**	20	20	25,0	125	35,0	VB..160408
3879774	**SVJBL2525M16**	25	25	32,0	150	35,0	VB..160408
3879771	**SVJBL3225P16**	32	25	32,0	170	35,0	VB..160408

SVVB 72,5°





See pages E99–E101, E125, E166, E176 for inserts.

order number	catalogue number	H	B	F	L1	L2	gage insert
neutral hand							
3879777	**SVVBN2020K16**	20	20	10,0	125	33,0	VB..160408
3879778	**SVVBN2525M16**	25	25	12,5	150	33,0	VB..160408
3879779	**SVVBN3225P16**	32	25	12,5	170	33,0	VB..160408

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WIDIA™

Tools for Internal Boring

Boring Bars

WIDIA™ offers an extensive range of toolholders for internal boring to meet even the most precise production demands across a broad spectrum of workpiece shapes and sizes.

WIDIA boring bars, available with both a conventional steel shank or a vibration-resistant carbide shank and coolant hole, guarantee consistent results and enhanced production reliability.

TOOLS FOR INTERNAL BORING

D-STYLE CLAMPING

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

P-STYLE CLAMPING

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.
- P-style available in metric sizes only.

S-STYLE CLAMPING

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

C-STYLE CLAMPING

- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

APPLICATIONS

BORING

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

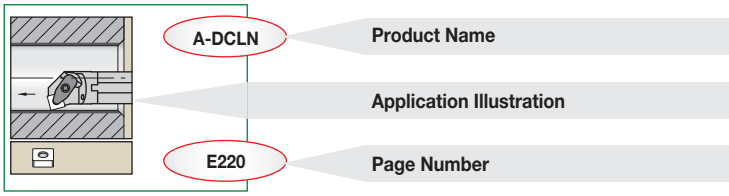
ENERGY

AEROSPACE

MEDICAL

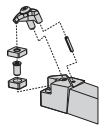
Boring Bar Selection Guide

Each unique clamping system offers product options to fill your specific toolholder needs. Find the illustration that fits your application and navigate to the corresponding page to get the correct solution.

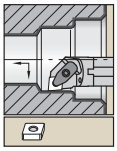


D-Style Clamping

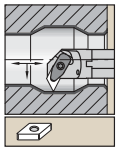
D



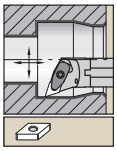
One-piece clamp assembly holder for use with negative style inserts. An extremely rigid clamping system. The tool is protected by a carbide shim.



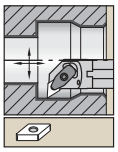
A-DCLN
95°
Page:
E220



A-DDPN
117,5°
Page:
E220

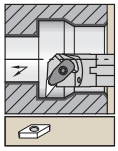


A-DDQN
107,5°
Page:
E221

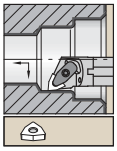


A-DDUN
93°
Page:
E221

A-DTFN
90°
Page:
E222



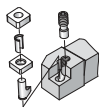
DVUN
93°
Page:
E222



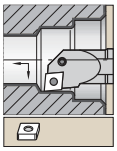
A-DWLN
95°
Page:
E223

P-Style Clamping

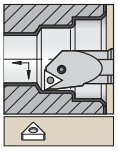
P



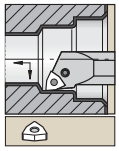
Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with chip flow.



A-PCLN
95°
Page:
E224



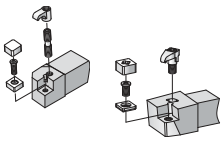
A-PTFN
90°
Page:
E224



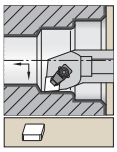
A-PWLN
95°
Page:
E225

C-Style Clamping

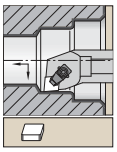
C



Top clamping system for negative and positive indexable inserts to DIN 4968. This universal clamping system is robust and easy to handle. Some height-adjustable clamps enable the use of additional chipbreakers. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs greater than 6,35mm.

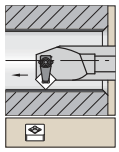


S-CCLN-MX
95°
Page:
E226

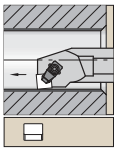


S-CCLN-MN
95°
Page:
E226

S-CDQN-MX
Page:
–



S-CSSN-MX
45°
Page:
–



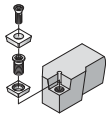
S-CSYN-MN
85°
Page:
–

S-CWLN-MX
95°
Page:
–

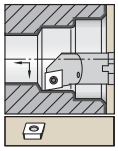
A-CTFP
90°
Page:
E231

S-Style Clamping

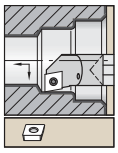
S



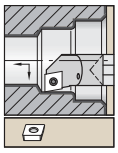
Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967. Compact design using a minimum of spare parts for high reliability and cost efficiency. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of .625" and insert iCs from .375" are secured by means of a threaded bushing.



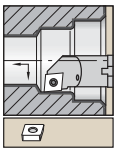
A-SCFP
90°
Page:
–



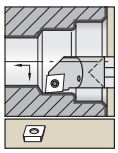
E-SCFC
90°
Page:
E232



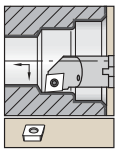
E-SCFP
90°
Page:
E232



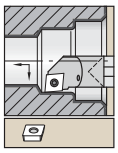
A-SCLC
95°
Page:
E229



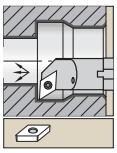
E-SCLC
95°
Page:
E233



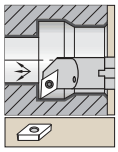
A-SCLP
95°
Page:
E233



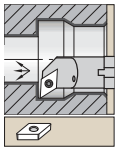
E-SCLP
95°
Page:
E234



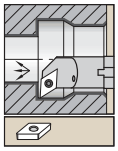
A-SDQC
107,5°
Page:
E229



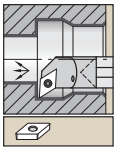
E-SDQC
107,5°
Page:
E234



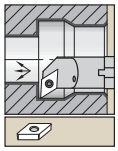
A-SDQP
Page:
E235



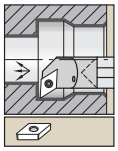
A-SDUC
93°
Page:
E230



E-SDUC
93°
Page:
E235



A-SDUP
93°
Page:
–



E-SDUP
93°
Page:
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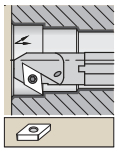

A-SDXP
95°
Page:
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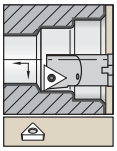
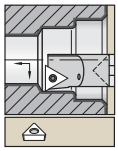
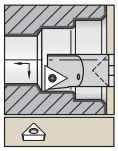


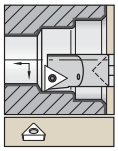
A-STFC
90°
Page:
E236



E-STFC
90°
Page:
E236



A-STFP
90°
Page:
E237



E-STFP
90°
Page:
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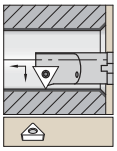

A-STWP
60°
Page:
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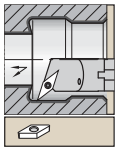
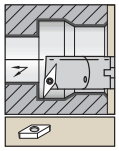


A-SVQB
107,5°
Page:
E231



A-SVUB
93°
Page:
E230

Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

A — Bar Type

A

Steel bar with coolant

S

Steel bar without coolant

C

Carbide bar

D

DeVibrator bar with coolant

D

Tunable bar with coolant

E

Carbide bar with coolant

B

DeVibrator

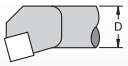
H

Interchangeable head

L

Heavy metal bar with coolant

32 — Bar Diameter



Metric:
A two-digit number indicates the bar diameter in mm.
If the diameter is represented by a one digit number, a 0 (zero) will be used in front of it.
Example:
8mm = 08

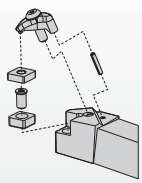
S — Bar Length**

3	=	F
3.5	=	G
4	=	H
4.5	=	J
5	=	K
5.5	=	L
6	=	M
6.5	=	N
7	=	Q
8	=	R
10	=	S
12	=	T
14	=	U
16	=	V
18	=	W
20	=	Y

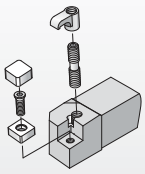
**Used only when more than one length is available or a special length is required.

D — Insert Holding Method

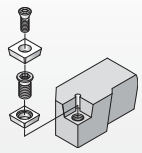
D



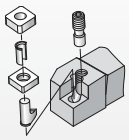
C



S

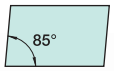


P

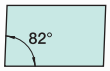


C — Insert Shape

A



B



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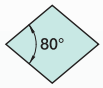
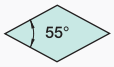


D

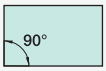


E

H

K

L



M

O

P

R

S

T

V

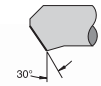
W

Catalog Numbering System

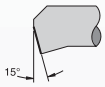
(continued)

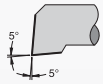
L

Bar Style or Lead Angle

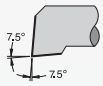
E 

F

K 

L 

(E-style inserts)

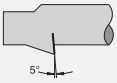
L 

P

Q

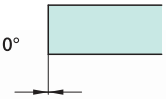
S

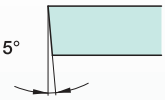
U

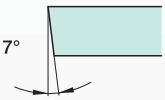
X 

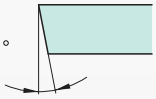
N

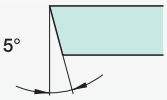
Insert Clearance Angle

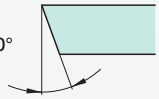
N 0° 

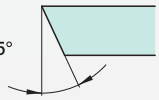
B 5° 

C 7° 

P 11° 

D 15° 

E 20° 

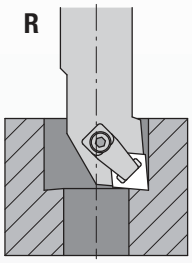
F 25° 

L

Hand of Tool

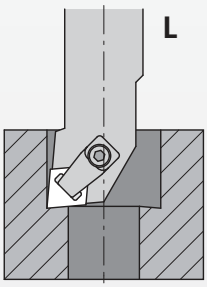
R =

Right-hand boring bar

R 

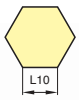
L =

Left-hand boring bar

L 

12

Insert Size Cutting Edge Length L10

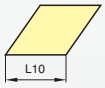
H 

O

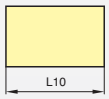
P

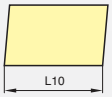
S

T

CDE M V 

W

L 

A B K 

R

KC04

Additional Information

M... =

M.. MF, MN, MX, for ceramic and PcBN inserts

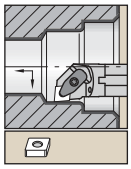
KC =

D-Style Clamping

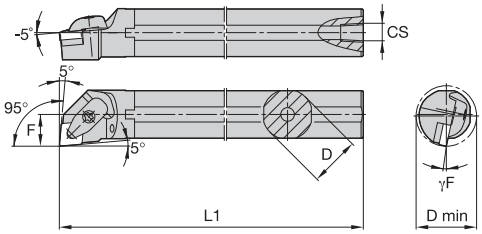
+ =

Insert thickness

A-DCLN 95°



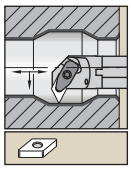
See pages E28–E42, E145, E159, E168–E169 for inserts.



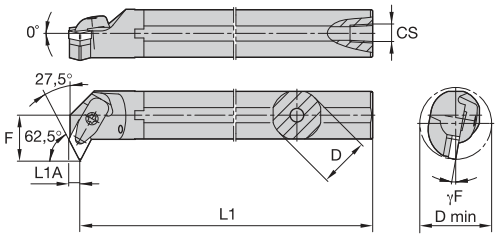
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696071	**A25RDCLNR12KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN.120408
5696073	**A32SDCLNR12KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN.120408
5696075	**A40TDCLNR12KC04**	40	50,0	27,0	300	1/4-18 NPT	-9.0	CN..120408
5696077	**A40TDCLNR16KC06**	40	50,0	27,0	300	1/4-18 NPT	-12.0	CN..160612
left hand								
5696072	**A25RDCLNL12KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN.120408
5696074	**A32SDCLNL12KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN.120408
5696076	**A40TDCLNL12KC04**	40	50,0	27,0	300	1/4-18 NPT	-9.0	CN.120408

A-DDPN-KC 117,5°



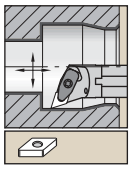
See pages E49–E60, E147, E162, E172–E173 for inserts.



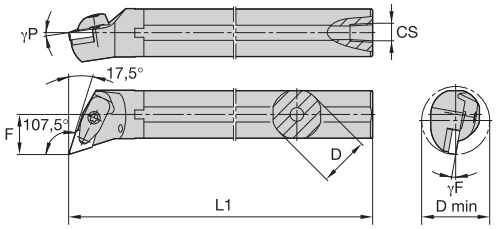
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	L1A	CS	γF°	gage insert
right hand									
5696082	**A40TDDPNR15KC06**	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608
left hand									
5696081	**A32SDDPNL15KC06**	32	45,0	27,0	250	6,5	1/4-18 NPT	-12.0	DN..150608

A-DDQN 107,5°



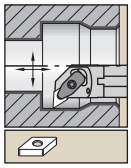
See pages E49–E60, E147, E162, E172–E173 for inserts.



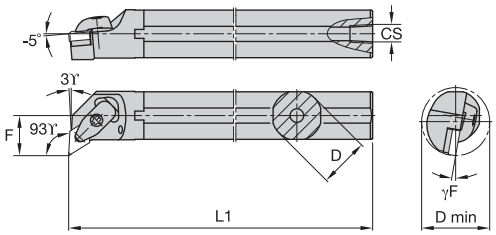
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert
right hand									
5696085	**A32SDDQNR15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-10.0	DN..150608
5696087	**A40TDDQNR15KC06**	40	50,0	27,0	300	1/4-18 NPT	-10.0	-10.0	DN..150608
left hand									
5696086	**A32SDDQNL15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	-10.0	DN..150608
5696088	**A40TDDQNL15KC06**	40	50,0	27,0	300	1/4-18 NPT	-10.0	-10.0	DN..150608

A-DDUN 93°



See pages E49–E60, E147, E162, E172–E173 for inserts.

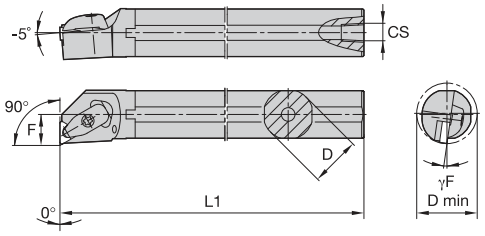


Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696089	**A25RDDUNR11KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	DN..110408
5696211	**A32SDDUNR11KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	DN..110408
5696213	**A32SDDUNR15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	DN..150608
5696215	**A40TDDUNR15KC06**	40	50,0	27,0	300	1/4-18 NPT	-9.0	DN..150608
5696217	**A50UDDUNR15KC06**	50	63,0	35,0	350	1/4-18 NPT	-7.0	DN..150608
left hand								
5696214	**A32SDDUNL15KC06**	32	40,0	22,0	250	1/4-18 NPT	-12.0	DN..150608
5696216	**A40TDDUNL15KC06**	40	50,0	27,0	300	1/4-18 NPT	-9.0	DN..150608
5696218	**A50UDDUNL15KC06**	50	63,0	35,0	350	1/4-18 NPT	-7.0	DN..150608

A-DTFN 90°

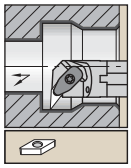
See pages E86–E95, E155, E164, E175 for inserts.



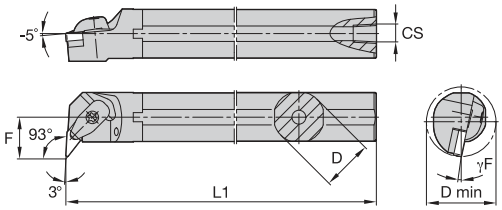
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696219	**A25RDTFNR16KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408
5696261	**A32SDTFNR16KC04**	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408
left hand								
5696260	**A25RDTFNL16KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408

A-DVUN 93°



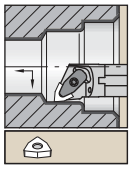
See pages E102–E108, E157, E166, E177 for inserts.



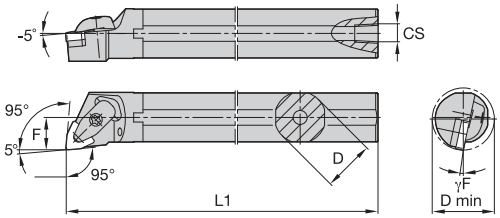
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696263	**A32SDVUNR16KC04**	32	40,0	22,0	250	1/4-18 NPT	-10.5	VN..160408
5696265	**A40TDVUNR16KC04**	40	50,0	27,0	300	1/4-18 NPT	-10.0	VN..160408

A-DWLN 95°



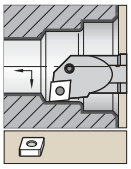
See pages E108–E116, E157, E167, E177 for inserts.



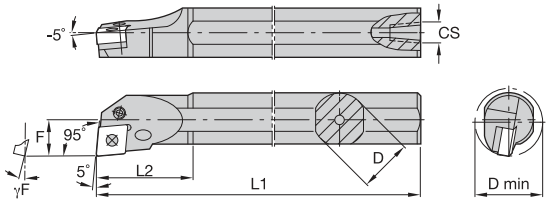
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696269	**A25RDWLNR08KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408
5696281	**A32SDWLNR08KC04**	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408
5696283	**A40TDWLNR08KC04**	40	50,0	27,0	300	1/4-18 NPT	-14.0	WN..080408
left hand								
5696268	**A25RDWLNL06KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	WN..060408
5696280	**A25RDWLNL08KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408
5696282	**A32SDWLNL08KC04**	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408
5696284	**A40TDWLNL08KC04**	40	50,0	27,0	300	1/4-18 NPT	-14.0	WN..080408

A-PCLN 95°



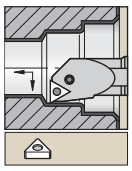
See pages E28–E42, E145, E159, E168–E169 for inserts.



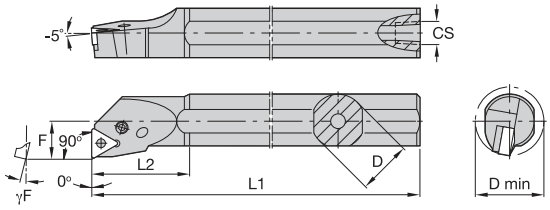
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert
right hand									
3883468	**A25TPCLNR12**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	CN..120408
3883466	**A32UPCLNR12**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	CN..120408
3883463	**A40TPCLNR12**	40	50,0	27,0	400	55	1/4-18 NPT	-10.0	CN..120408
3883442	**A40TPCLNR16**	40	50,0	27,0	400	55	1/4-18 NPT	-11.0	CN..160612
left hand									
3883469	**A25TPCLNL12**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	CN..120408
3883467	**A32UPCLNL12**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	CN..120408
3883465	**A40TPCLNL12**	40	50,0	27,0	400	55	1/4-18 NPT	-10.0	CN..120408

A-PTFN 90°



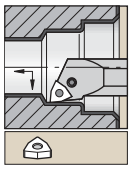
See pages E86–E95, E155, E164, E175 for inserts.



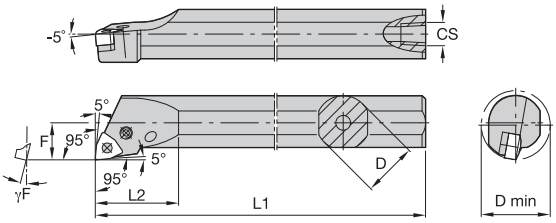
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert
right hand									
3883263	**A25TPTFNR16**	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	TN..160408
3883151	**A32UPTFNR16**	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	TN..160408
3883149	**A40VPTFNR22**	40	48,0	27,0	400	55	1/4-18 NPT	-10.0	TN..220408

A-PWLN 95°



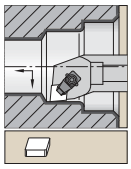
See pages E108–E116, E157, E167, E177 for inserts.



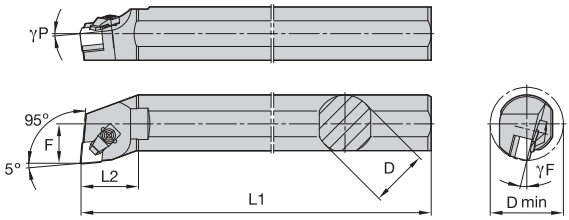
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert
right hand									
3883459	**A16RPWLNR06**	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060404
3883455	**A20SPWLNR06**	20	25,0	13,0	250	—	1/8-27 NPT	-14.0	WN..060408
3883458	**A25RPWLNR08**	25	32,0	17,0	200	—	1/4-18 NPT	-12.0	WN..080408
3883454	**A32SPWLNR08**	32	40,0	22,0	250	50	1/4-18 NPT	-10.0	WN..080408
left hand									
3883461	**A16RPWLNL06**	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060404
3883457	**A20SPWLNL06**	20	25,0	13,0	250	—	1/8-27 NPT	-14.0	WN..060408
3883456	**A32SPWLNL08**	32	40,0	22,0	250	50	1/4-18 NPT	-10.0	WN..080408

S-CCLN-MX 95°



See page E146 for inserts.

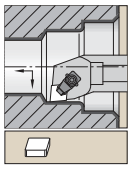


Steel shank with through coolant.

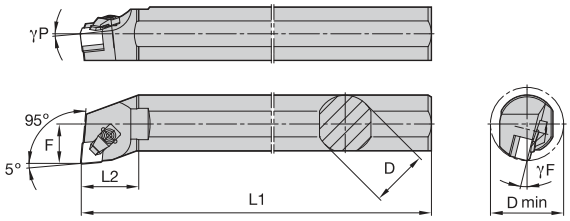
order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert
right hand									
3883565	**S32SCCLNR12MX7**	32	40,0	22,0	251	43	-14.0	-5.0	CN.X120708

NOTE: MN — clamping version is shown.

S-CCLN-MN 95°



See page E146 for inserts.

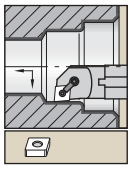


Steel shank with through coolant.

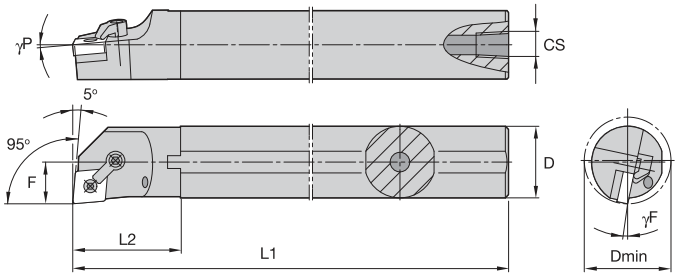
order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert
right hand									
3029011	**S40TCCLNR12MN4**	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120408

NOTE: MN — clamping version is shown.

A-MCLN 95°

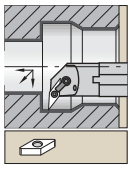


Steel shank with through coolant See pages E28-E42, E145, E159, E168-E169 for inserts.

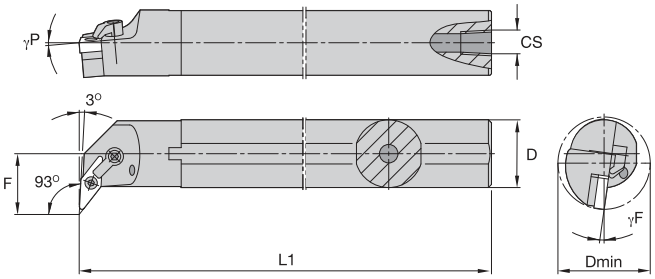


order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert
right hand									
3852651	**A50UMCLNR12**	50	63,0	35,0	350	1/4-18 NPT	-7.0	-5.0	CN..120408
3852663	**A50UMCLNR16**	50	63,0	35,0	350	1/4-18 NPT	-8.0	-5.0	CN..160612
3852664	**A50UMCLNR19**	50	63,0	35,0	350	1/4-18 NPT	-8.0	-5.0	CN..190612
left hand									
3852652	**A50UMCLNL12**	50	63,0	35,0	350	1/4-18 NPT	-7.0	-5.0	CN..120408

A-MVUN 93°



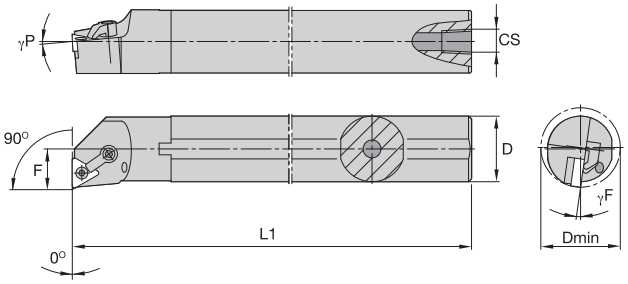
Steel shank with through coolant See pages E102-E108, E157, E166, E177 for inserts.



order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert
right hand									
3852690	**A25RMVUNR16**	25	37,0	22,0	200	1/4-18 NPT	-12.0	-5.0	VN..160408

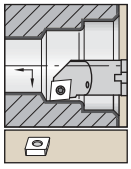
A-MTFN 90°

Steel shank with through coolant See pages E86-E95, E155, E164, E175 for inserts.

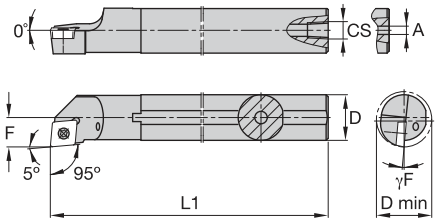


order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert
left hand									
3852685	**A40TMTFNL16**	40	50,0	27,0	300	1/4-18 NPT	-9.0 deg	-5.0	TN..160408

A-SCLC 95°



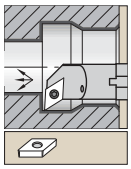
See pages E22–E27, E122, E158, E167–E168 for inserts.



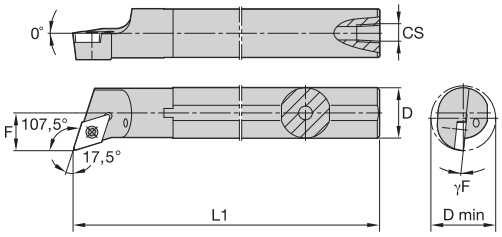
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
3883285	**A08JSCLCR06**	8	11,0	6,0	110	2,4	—	-8.0	CC..060204
3883283	**A10KSCLCR06**	10	13,0	7,0	125	3,2	—	-7.0	CC..060204
3883271	**A16RSCLCR09**	16	20,0	11,0	200	—	1/8-27 NPT	-7.0	CC..09T308
3883269	**A20SSCLCR09**	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308
3883265	**A25TSCLCR12**	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408
3883266	**A32TSCLCR12**	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408
left hand									
3883286	**A08JSCLCL06**	8	11,0	6,0	110	2,4	—	-8.0	CC..060204
3883284	**A10KSCLCL06**	10	13,0	7,0	125	3,2	—	-7.0	CC..060204
3883272	**A16RSCLCL09**	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308
3883270	**A20SSCLCL09**	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	CC..09T308
3883267	**A25TSCLCL12**	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408
3883268	**A32TSCLCL12**	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408

A-SDQC 107,5°



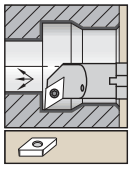
See pages E44–E48, E123, E161, E170–E171 for inserts.



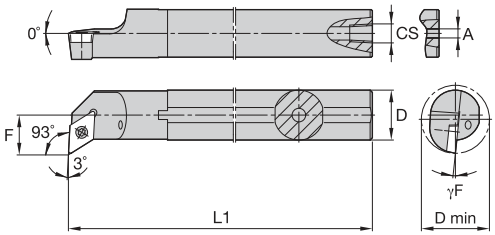
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
3883476	**A16RSDQCR07**	16	20,0	11,0	200	1/8-27 NPT	-5.0	DC..070204
3883474	**A20SSDQCR11**	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308
3883462	**A25TSDQCR11**	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308
left hand								
3883475	**A20SSDQCL11**	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308
3883473	**A25TSDQCL11**	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308

A-SDUC 93°



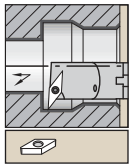
See pages E44-E48, E123, E161, E170-E171 for inserts.



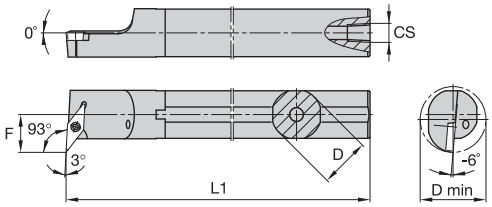
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
3883297	**A10KSDUCR07**	10	13,0	7,0	125	3,2	—	-7.0	DC..070204
3883294	**A16RSDUCR07**	16	20,0	11,0	200	—	1/8-27 NPT	-4.0	DC..070204
3883293	**A16RSDUCR11**	16	20,0	11,0	200	—	1/8-27 NPT	-6.0	DC..11T308
3883291	**A20SSDUCR11**	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	DC..11T308
3883288	**A25TSDUCR11**	25	32,0	17,0	300	—	1/8-27 NPT	-4.0	DC..11T308
3883287	**A32TSDUCR15**	32	40,0	22,0	300	—	1/4-18 NPT	-7.0	DC..150408
left hand									
3883298	**A10KSDUCL07**	10	13,0	7,0	125	3,2	—	-7.0	DC..070204
3883296	**A16RSDUCL07**	16	20,0	11,0	200	—	1/8-27 NPT	-4.0	DC..070204
3883295	**A16RSDUCL11**	16	20,0	11,0	200	—	1/8-27 NPT	-6.0	DC..11T308
3883292	**A20SSDUCL11**	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	DC..11T308
3883290	**A25TSDUCL11**	25	32,0	17,0	300	—	1/8-27 NPT	-4.0	DC..11T308
3883289	**A32TSDUCL15**	32	40,0	22,0	300	—	1/8-27 NPT	-7.0	DC..150408

A-SVUB 93°



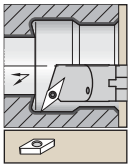
See pages E99-E101, E125, E166, E176 for inserts.



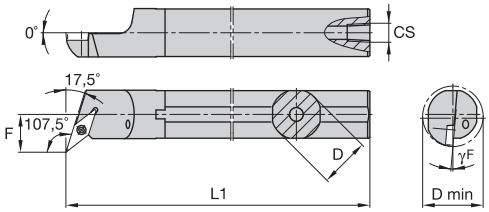
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	gage insert
right hand							
3883440	**A20SSVUBR11**	20	25,0	13,0	250	1/8-27 NPT	VB..110304
3883438	**A25TSVUBR16**	25	32,0	17,0	300	1/4-18 NPT	VB..160408
left hand							
3883439	**A25TSVUBL16**	25	32,0	17,0	300	1/4-18 NPT	VB..160408

A-SVQB 107,5°



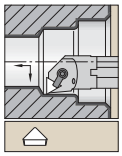
See pages E99-E101, E125, E166, E176 for inserts.



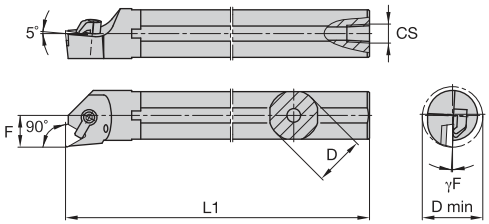
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
3883436	**A16RSVQBR11**	16	20,0	11,0	200	1/8-27 NPT	-7.0	VB..110304
3883434	**A25TSVQBR16**	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408
left hand								
3883435	**A25TSVQBL16**	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408

A-CTFP 90°



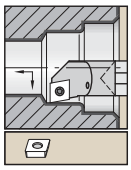
See pages E96, E98, E165 for inserts.



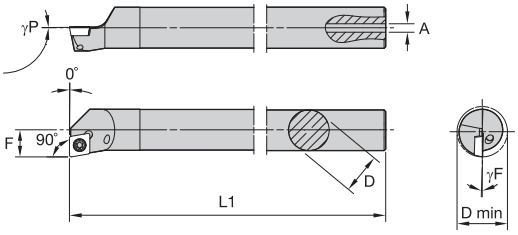
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
3883451	**A16RCTFPR11**	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304
3883450	**A25RCTFPR16**	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308

E-SCFC 90°



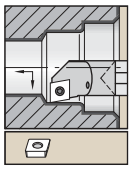
See pages E22–E27, E122, E158, E167–E168 for inserts.



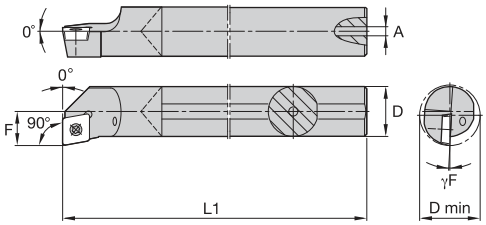
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	γF°	γP°	gage insert
right hand									
2023600	**E08KSCFCR06**	8	11,0	6,0	125	3,0	-12.0	0.0	CC..060204
left hand									
2031019	**E08KSCFCL06**	8	11,0	6,0	125	3,0	-12.0	0.0	CC..060204

E-SCFP 90°



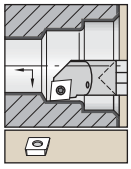
See pages E43, E160, E169–E170 for inserts.



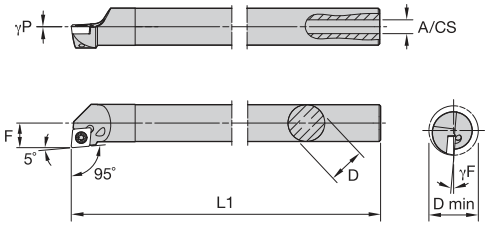
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	γF°	gage insert
right hand								
2010047	**E06JSCFPR04**	6	8,0	4,5	110,0	2,0	-10.0	CP..04T104
5092759	**E08KSCFPR06A**	8	11,0	5,9	124,3	2,4	-8.0	CP..060204
5092921	**E10MSCFPR06A**	10	13,0	6,9	149,3	7,1	-4.0	CP..060204

E-SCLC 95°



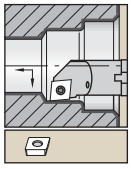
See pages E22–E27, E122, E158, E167–E168 for inserts.



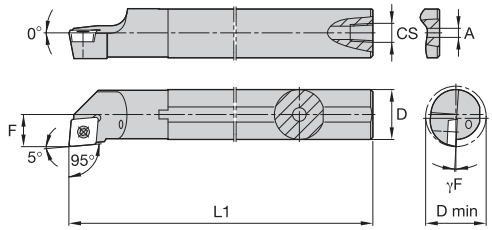
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert
right hand										
2010068	**E08KSCLCR06**	8	11,0	6,0	125	3,0	—	-12.0	0.0	CC..060204
2023603	**E08KSCLCR065**	8	10,0	5,0	125	3,0	—	-15.0	0.0	CC..060204
2031021	**E10MSCLCR06**	10	13,0	7,0	151	3,2	—	-10.0	0.0	CC..060204
2023608	**E12QSCLCR06**	12	16,0	9,0	180	4,5	—	-8.0	0.0	CC..060204
2010139	**E16RSCLCR09**	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..090308
2023614	**E16RSCLCR09T3**	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..09T308
2023621	**E20SSCLCR09**	20	25,0	13,0	250	—	G1/8	-5.0	0.0	CC..090308
2010184	**E20SSCLCR09T3**	20	25,0	13,0	250	—	G1/8	-5.0	0.0	CC..09T308
2010224	**E25TSCLCR09T3**	25	32,0	17,0	300	—	G1/4	-3.0	0.0	CC..09T308
2023632	**E32USCLCR12**	32	40,0	22,0	350	—	G1/4	-10.0	0.0	CC..120408
left hand										
2023601	**E08KSCLCL06**	8	11,0	6,0	125	3,0	—	-12.0	0.0	CC..060204
2031020	**E08KSCLCL065**	8	10,0	5,0	125	3,0	—	-15.0	0.0	CC..060204
2031022	**E10MSCLCL06**	10	13,0	7,0	151	3,2	—	-10.0	0.0	CC..060204
2023607	**E12QSCLCL06**	12	16,0	9,0	180	4,5	—	-8.0	0.0	CC..060204
2023613	**E16RSCLCL09**	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..090308
2031026	**E20SSCLCL09**	20	25,0	13,0	250	—	G1/8	-5.0	0.0	CC..090308
2010215	**E25TSCLCL09**	25	32,0	17,0	300	—	G1/4	-3.0	0.0	CC..090308

A-SCLP 95°



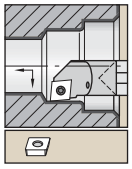
See pages E43, E160, E169–E170 for inserts.



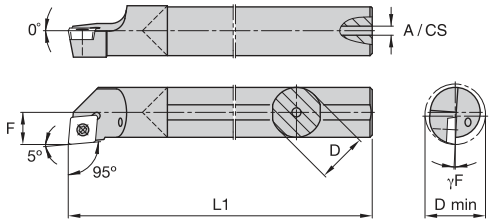
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
5077645	**A10KSCLPR06**	10	13,0	7,0	125	3,2	—	-4.0	CP..0602..
5077681	**A12MSCLPR06**	12	16,0	9,0	150	4,0	—	-3.0	CP..0602..
5077694	**A16RSCLPR06**	16	20,0	11,0	200	—	1/8-27 NPT	-5.0	CC..0602..
left hand									
5077680	**A12MSCLPL06**	12	16,0	9,0	150	4,0	—	-3.0	CP..0602..

E-SCLP 95°



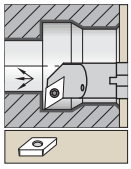
See pages E43, E160, E169–E170 for inserts.



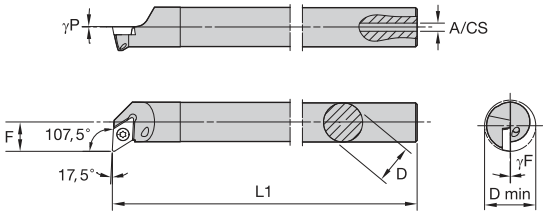
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	γF°	gage insert
right hand								
2023598	**E06JSCLPR04**	6	8,0	4,5	110	2,0	-10.0	CP..04T104
5093094	**E08KSCLPR06A**	8	11,0	5,9	123	2,4	-6.0	CP..060204
5093185	**E20SSCLPR09**	20	25,0	12,9	251	7,1	-2.0	CP..09T308
left hand								
2023597	**E06JSCLPL04**	6	8,0	4,5	110	2,0	-10.0	CP..04T104

E-SDQC 107,5°



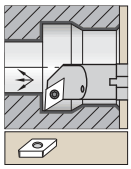
See pages E44–E48, E123, E161, E170–E171 for inserts.



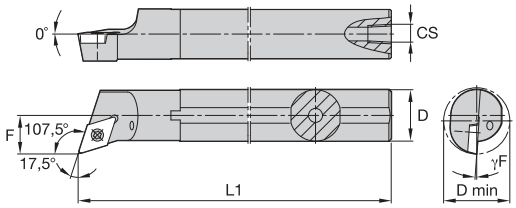
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert
right hand										
2010111	**E12QSDQCR07**	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204
2031025	**E16RSDQCR07**	16	20,0	11,0	200	5,5	—	-5.0	0.0	DC..070204
2023623	**E20SSDQCR11**	20	25,0	13,0	250	—	G1/8	-7.0	0.0	DC..11T308
left hand										
2031023	**E12QSDQCL07**	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204
2010148	**E16RSDQCL07**	16	20,0	11,0	200	5,5	—	-5.0	0.0	DC..070204
2023622	**E20SSDQCL11**	20	25,0	13,0	250	—	G1/8	-7.0	0.0	DC..11T308

A-SDQP



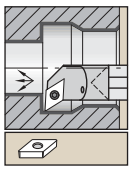
See pages E162–E163 for inserts.



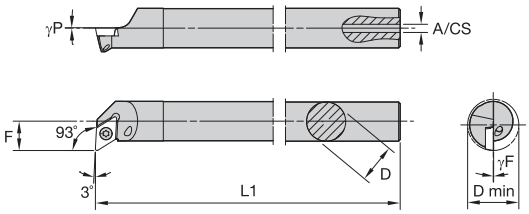
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5078298	**A20SSDQPR11**	20	25,0	13,0	250	1/8-27 NPT	2.0	DP..11T3..

E-SDUC 93°



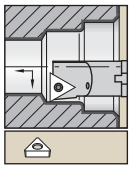
See pages E44–E48, E123, E161, E170–E171 for inserts.



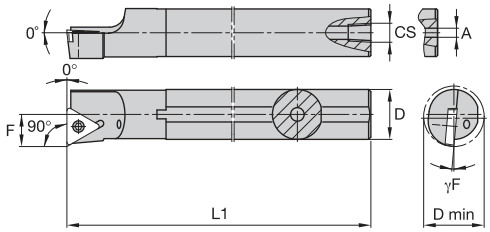
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert
right hand										
2023611	**E12QSDUCR07**	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204
2010157	**E16RSDUCR07**	16	20,0	11,0	200	4,5	—	-5.0	0.0	DC..070204
2023624	**E20SSDUCR11**	20	25,0	13,0	250	—	G1/8	-7.0	0.0	DC..11T308
2023630	**E25TSDUCR11**	25	32,0	17,0	300	—	G1/4	-5.0	0.0	DC..11T308
left hand										
2023610	**E12QSDUCL07**	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204
2023617	**E16RSDUCL07**	16	20,0	11,0	200	4,5	—	-5.0	0.0	DC..070204
2010193	**E20SSDUCL11**	20	25,0	13,0	250	—	G1/8	-7.0	0.0	DC..11T308
2023629	**E25TSDUCL11**	25	32,0	17,0	300	—	G1/4	-5.0	0.0	DC..11T308

A-STFC 90°



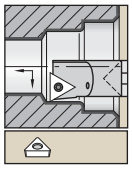
See pages E83–E85, E124, E163–E164, E175 for inserts.



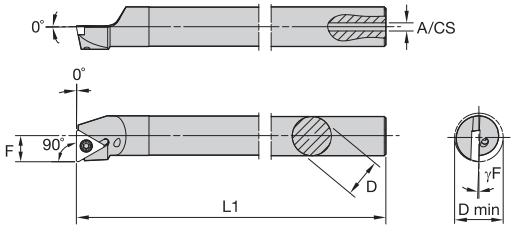
Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	γF°	gage insert
right hand								
3883382	**A10KSTFCR11**	10	13,0	7,0	125	3,2	-7.0	TC..110204

E-STFC 90°



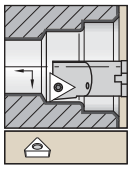
See pages E83–E85, E124, E163–E164, E175 for inserts.



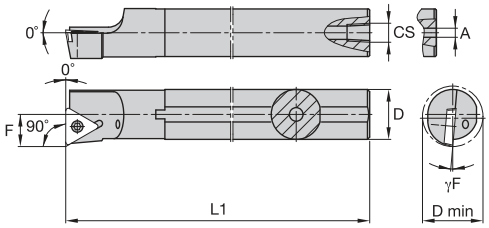
Carbide shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
2031888	**E10MSTFCR11**	10	13,0	7,0	150	3,5	—	-10.0	TC..110204
2031024	**E12QSTFCR11**	12	16,0	9,0	180	4,5	—	-8.0	TC..110204
2010174	**E16RSTFCR16**	16	20,0	11,0	200	4,5	—	-9.0	TC..16T308
2023626	**E20SSTFCR16**	20	25,0	13,0	250	—	G1/8	-7.0	TC..16T308
2023631	**E25TSTFCR16**	25	32,0	17,0	300	—	G1/4	-5.0	TC..16T308
left hand									
2010090	**E10MSTFCL11**	10	13,0	7,0	150	3,5	—	-10.0	TC..110204
2010120	**E12QSTFCL11**	12	16,0	9,0	180	4,5	—	-8.0	TC..110204
2023618	**E16RSTFCL16**	16	20,0	11,0	200	4,5	—	-9.0	TC..16T308
2023625	**E20SSTFCL16**	20	25,0	13,0	250	—	G1/8	-7.0	TC..16T308
2010233	**E25TSTFCL16**	25	32,0	17,0	300	—	G1/4	-5.0	TC..16T308

A-STFP 90°



See page E97 for inserts.



Steel shank with through coolant.

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
3883446	**A10KSTFPR11**	10	13,0	7,0	125	3,2	—	-4.0	TP..110204
5086802	**A12MSTFPR11**	12	16,0	9,0	150	4,0	—	-2.0	TP..110204
3883444	**A16RSTFPR11**	16	20,0	11,0	200	—	1/16-27 NPT	0.0	TP..110204

Cartridges

Cartridges for Negative and Positive Inserts

Standard WIDIA™ cartridges are ideal for turning tools with one or several cutting edges. A wide range of cartridge sizes and styles provides numerous combinations and application possibilities.

Same clamping systems as standard turning toolholders.

Overall sizes to DIN and ISO are ideal for single- and multi-tooth turning, boring, and spotting tools.

Precise axial and radial positioning by adjustment screws.

CARTRIDGES

P-STYLE CLAMPING

- Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter.
- Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°.
- Advantages of this system are fast insert changes and no interference with chip flow.
- P-style available in metric sizes only.

S-STYLE CLAMPING

- Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967.
- Compact design using a minimum of spare parts for high reliability and cost efficiency.
- A carbide shim provides additional tool protection.
- Toolholders with cutting edge heights upwards of 16mm (.625") and insert iCs from 9,52mm (.375") are secured by means of a threaded bushing.

APPLICATIONS

BORING | I. D. CHAMFERING | I. D. FACING

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

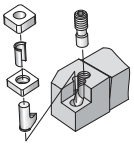
ENERGY

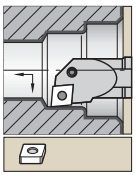
AEROSPACE

MEDICAL

P-Style Clamping

P





PCLN

95°

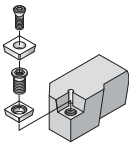
Page:

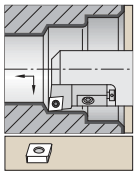
E194

Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with chip flow.

Clamping System S

S



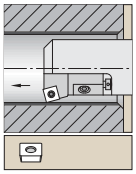


SCLC

95°

Page:

E207

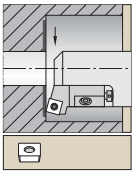


SSKC

75°

Page:

E244

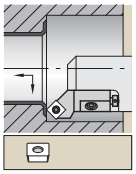


SSRC

75°

Page:

E245



SSSC

45°

Page:

E245

Combined pin/wedge clamp for negative inserts. An extremely sturdy clamping system, specially designed for interrupted cuts. The tool is protected by a carbide shim.

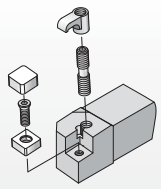
Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

M

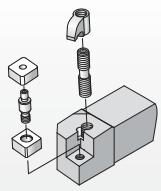
Insert Clamping System

C



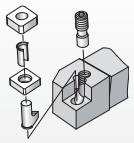
Top clamping by clamping finger for inserts without hole.

M



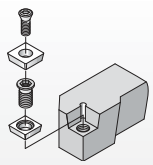
Top and hole clamping for inserts with hole.

P



Insert clamping by toggle lever for insert hole.

S



Center clamping by screw for inserts with hole.

C

Insert Shape

C

D

R

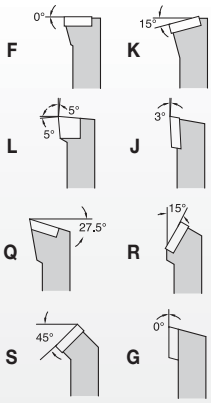
S

T

W

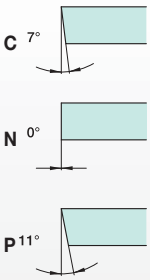
F

Cartridge Style



N

Insert Clearance Angle

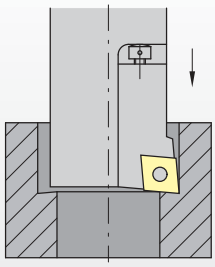


R

Hand of Tool

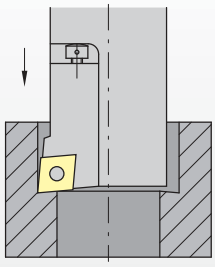
Right-hand cartridge

R



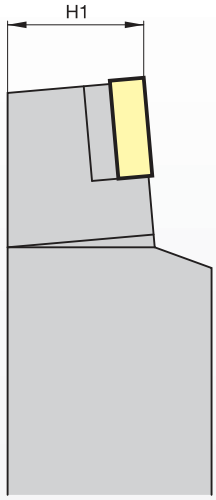
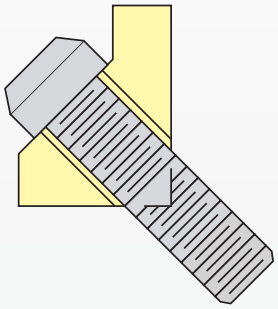
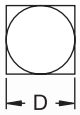
Left-hand cartridge

L

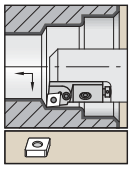


Catalog Numbering System

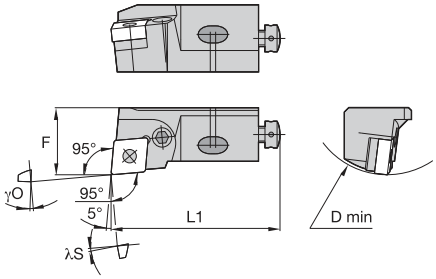
(continued)

10	C	A	3	
Cartridge Size	Identifying Code of Cartridge	Mounting Design of Cartridge	Insert Size	Additional Information
 **H1** = Cutting edge height of cartridge, in inches	**C** = Cartridge	A-design conforming to ISO 5611 	 **Insert iC** Number of 1/8ths of “D”	

PCLN 95°

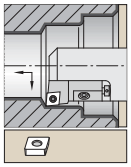


See pages E28–E42, E145, E159, E168–E169 for inserts.

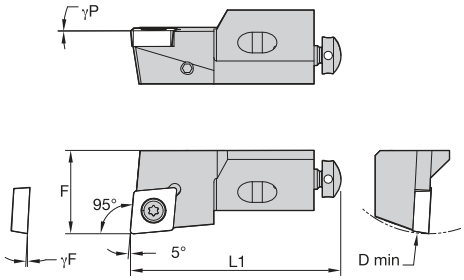


order number	catalogue number	D min	F	L1	λS°	γO°	gage insert
right hand							
3871290	**PCLNR16CA12**	60	25,0	63	-6.0	-7.0	CN..120408/CN..432

SCLC 95°

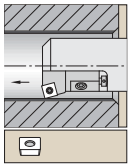


See pages E22–E27, E122, E158, E167–E168 for inserts.

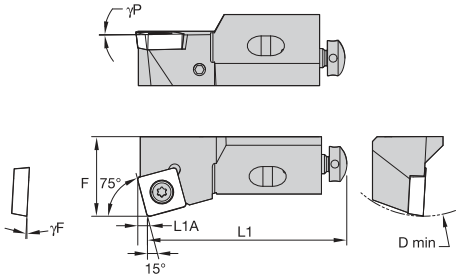


order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
left hand							
3871267	**SCLCL12CA12**	50	20,0	55	-3.0	0.0	CC..120408/CC..432

SSKC 75°

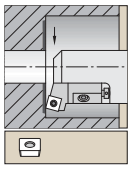


See pages E64–E67 for inserts.

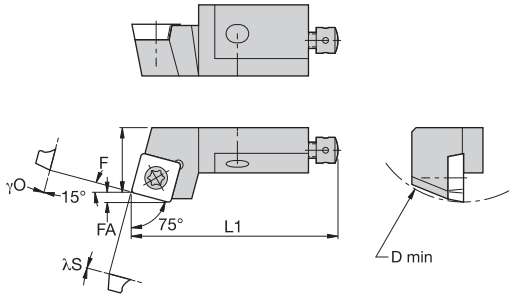


order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
3871191	**SSKCR12CA12**	50	20,0	55	3	-3.0	0.0	SC..120408/SC..432

SSRC 75°

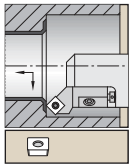


See pages E64–E67 for inserts.

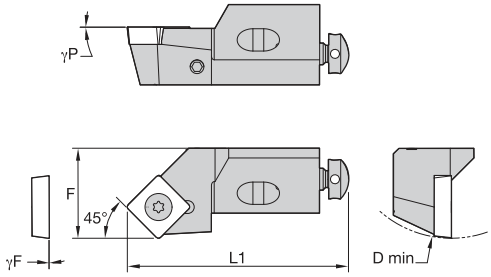


order number	catalogue number	D min	F	FA	L1	λS°	γO°	gage insert
left hand								
3870391	**SSRCL12CA12**	50	20,0	3,1	55	-3.0	0.0	SC..120408/SC..432

SSSC 45°



See pages E64–E67 for inserts.

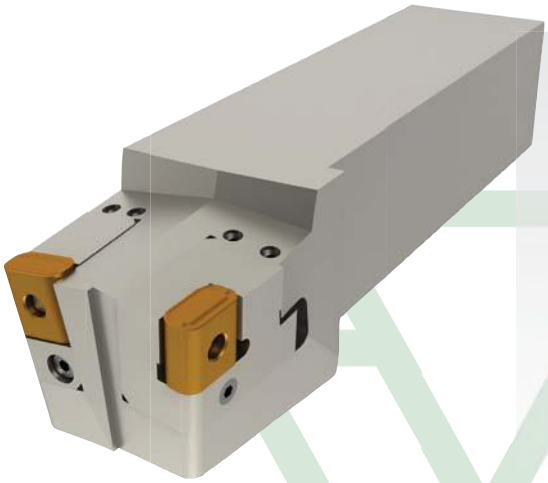


order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3870385	**SSSCR12CA12**	50	20,0	47	-3.0	0.0	SC..120408/SC..432

Railway Wheelset Reconditioning Tools

Wheel Reprofiling/Wheelset Turning

Toolholders and indexable inserts for all types of wheel lathes used in the railroad industry.



TOOLHOLDERS

- Robust lever clamping design with no top clamp to interfere with chip flow.
- Toolholders are made from heat-treated alloy steel, providing rigid support to the insert to withstand severe roughing cuts on work-hardened wheels.

INSERTS

- Upended inserts are neutral and common for either hand of the toolholder.
- Multiple chipbreaker profiles and highly wear-resistant coated carbide grades
- Grades are available to machine the wheels in a range of wear conditions.

WIDIA™ TOOLS FOR RAILWAY WHEEL MACHINING

WIDIA offers toolholders and indexable inserts for all types of wheel lathes being used in the Industry.

- The tooling for wheelset reprofiling/reconditioning has been developed in close cooperation with machine tool builders and railway workshops.
- The wheel profile wears during usage and also due to skidding, mismatched wheels, etc.
- Different chipbreaker profiles and grades are available to machine the wheels with different wear conditions.
- The upended design of inserts enhances the insert strength and the chipbreakers are designed to provide optimum performance with efficient chipbreaking while machining the profile.
- The toolholders adopt the robust lever clamping system.

WIDIA tooling solutions for heavy-duty turning have a proven history of success in these extremely demanding applications around the world. Customers looking for maximum material removal and improved productivity can rely on WIDIA to provide the right tool, inserts, and grades for their workpiece, machine tool, and applications.

APPLICATIONS

TURNING

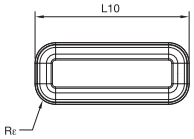
FACING

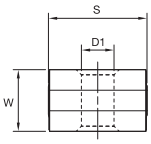
PROFILING

INDUSTRY

TRANSPORTATION

Railway Wheel Reprofiling Inserts • LNUX-16



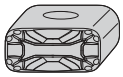


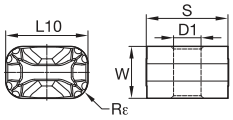
● first choice
○ alternate choice

P	○	●
M		
K	●	○
N		
S		
H		

ISO catalogue number	W	L10	S	Rε	D1	WK20CT	WP15CT
LNUX30194016	12,00	30,00	19,05	4,0	6,35	-	6128295

Railway Wheel Reprofiling Inserts • LNUX-13



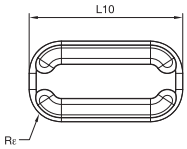


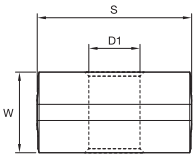
● first choice
○ alternate choice

P	○	●
M		
K	●	○
N		
S		
H		

ISO catalogue number	W	L10	S	Rε	D1	WK20CT	WP15CT
LNUX19194013	10,00	19,05	19,05	4,0	6,35	4170966	-
LNUX30194013	12,00	30,00	19,05	4,0	6,35	4170968	-

Railway Wheel Reprofiling Inserts • LNUX-T



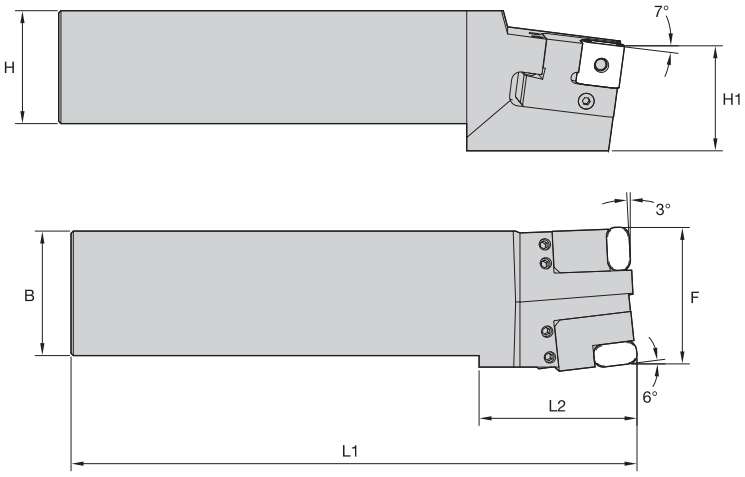


● first choice
○ alternate choice

P	○	●
M		
K	●	○
N		
S		
H		

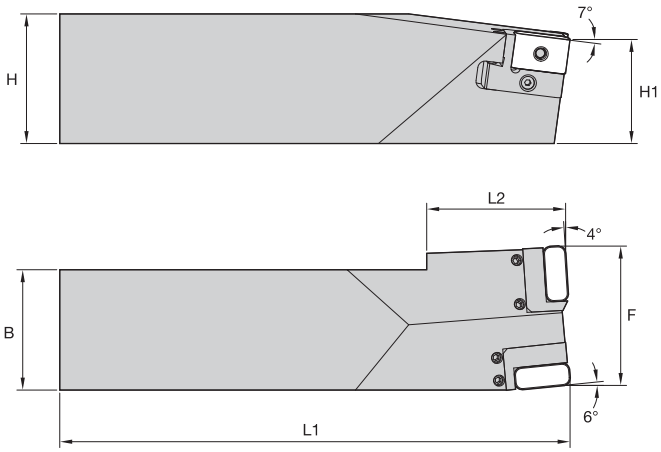
ISO catalogue number	W	L10	S	Rε	D1	WK20CT	WP15CT
LNUX191940T	10,00	19,05	19,05	4,0	6,35	4170967	6128294
LNUX301940T	12,00	30,00	19,05	4,0	6,35	4170969	-

Railway Toolholder • Wheel Turning Lathe • Left Hand • LNUX19 Inserts



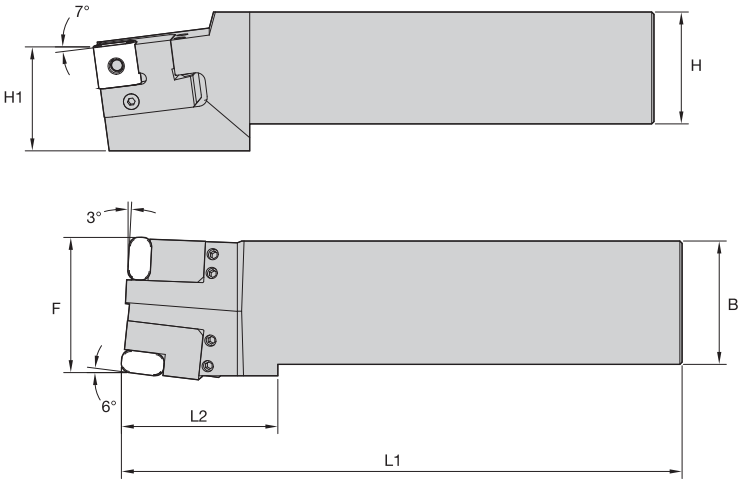
order number	catalogue number	B	F	H	H1	L1	L2
left hand							
2552320	6939143120	55,00	60,00	50,00	46,00	250,00	70,00

Railway Toolholder • Wheel Turning Lathe • Left Hand • LNUX30 Inserts



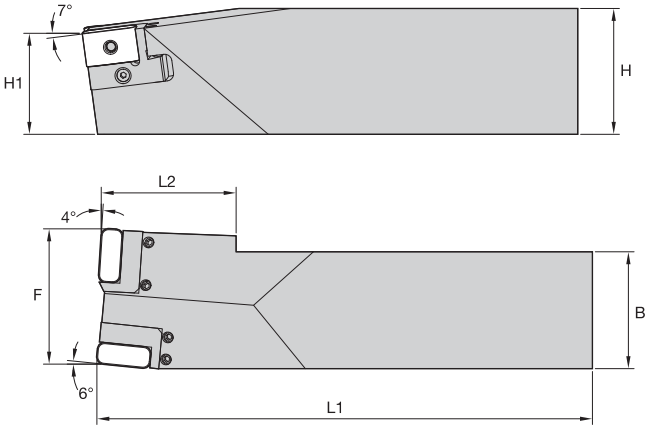
order number	catalogue number	B	F	H	H1	L1	L2
left hand							
2552318	6939145820	65,00	75,00	70,00	56,00	276,00	77,78

Railway Toolholder • Wheel Turning Lathe • Right Hand • LNUX19 Inserts



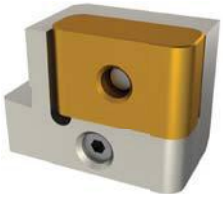
order number	catalogue number	B	F	H	H1	L1	L2
right hand							
2552321	6939143110	55,00	60,00	50,00	46,00	250,00	70,00

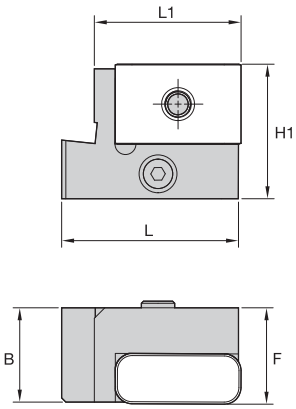
Railway Toolholder • Wheel Turning Lathe • Right Hand • LNUX30 Inserts



order number	catalogue number	B	F	H	H1	L1	L2
right hand							
2552319	6939145810	65,00	75,00	70,00	56,00	276,00	77,78

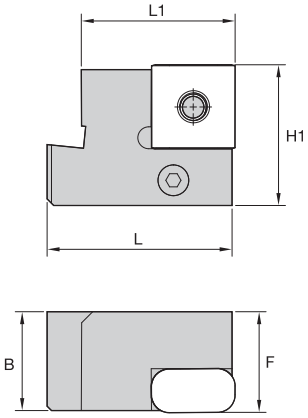
Railway Turning Cassette • Wheel Turning Lathe • Left Hand • LNUX30 Inserts





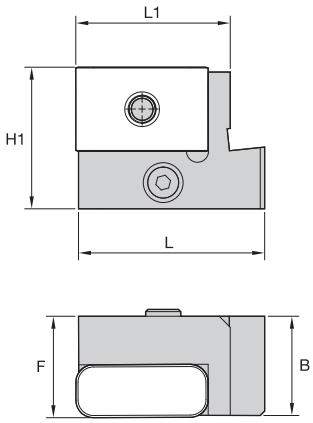
order number	catalogue number	B	F	L	L1	H1	gage insert
left hand							
2035331	6939318620	22,50	23,00	42,20	35,00	32,10	LNUX301940

Railway Turning Cassette • Wheel Turning Lathe • Left Hand • LNUX30 Inserts



order number	catalogue number	B	F	L	L1	H1	gage insert
left hand							
2276948	6939318820	22,55	23,00	42,20	35,00	32,00	LNUX191940

Railway Turning Cassette • Wheel Turning Lathe • Right Hand • LNUX19 Inserts



order number	catalogue number	B	F	L	L1	H1	gage insert
right hand							
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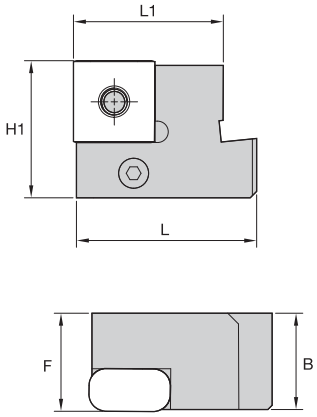
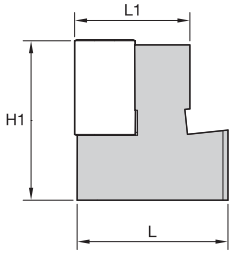
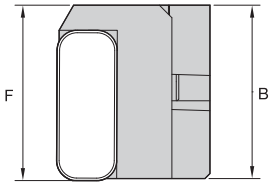
Railway Turning Cassette • Wheel Turning Lathe • Right Hand • LNUX30 Inserts



order number	catalogue number	B	F	L	L1	H1	gage insert
right hand							
2276947	6939318710	22,55	23,00	42,20	35,00	32,00	LNUX191940

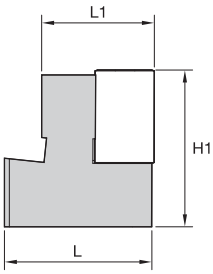
Railway Facing Cassette • Wheel Turning Lathe • Left Hand • LNUX19 Inserts

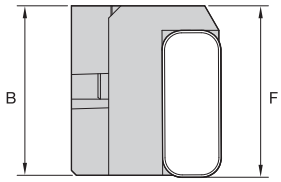




order number	catalogue number	B	F	L	L1	H1	gage insert
left hand							
2403738	6939322020	34,60	35,00	30,10	23,00	32,00	LNUX301940

Railway Facing Cassette • Wheel Turning Lathe • Right Hand • LNUX19 Inserts



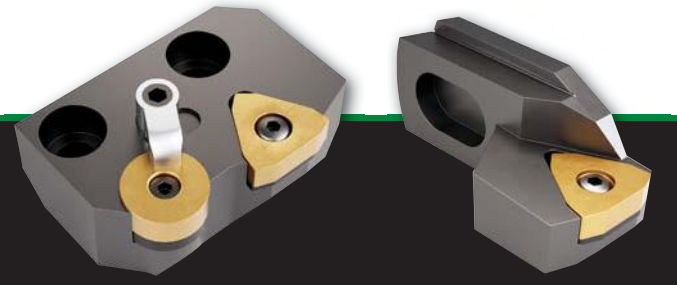


order number	catalogue number	B	F	L	L1	H1	gage insert
right hand							
2403739	6939322110	34,60	35,00	30,10	23,00	32,00	LNUX301940

WIDIA™ Tools for Bar Peeling Applications

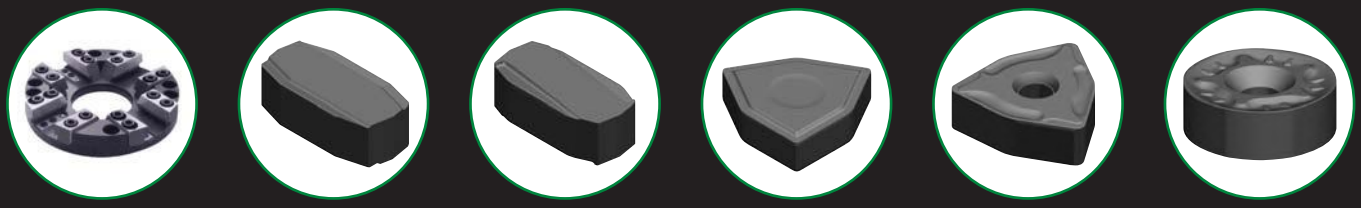
Bar peeling is a unique and economical machining operation for the production of cylindrical surfaces on blank bars (e.g., round bars, wires, blocks, and pipes) with high surface finishes and dimensional accuracies.

During the bar peeling process, scales, cracks, and sand inclusion are removed. Bar peeling is faster than conventional turning. It is used when high volumes, high quality, and high productivity with good surface finish are required.



New bar peeling machines demand high performance from cutting tools. WIDIA offers a wide variety of inserts in different grades for cost-effective bar peeling operations in different types of steels, stainless steels, etc. WIDIA also offers toolholders and cartridges for bar peeling as a custom solution.

- Ideal in high feed rate applications, WIDIA bar peeling tools enable economical machining operations for the production of cylindrical surfaces on bright bars.
- High surface finishes, dimensional accuracy, and most efficient removal of scales, cracks, sand enclosures, and other errors.



Application Range of WIDIA™ Bar Peeling Tools

Bar peeling machines require a high level of utilization and demand high performance from the cutting tools. WIDIA offers specially developed tools with indexable inserts for bar peeling, which are capable of meeting these demands, making manufacturing more cost-efficient.

WIDIA Victory™ CVD-Coated Grades

WP15CT

Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-ZrCN. Good balance of wear resistance and toughness properties. High productivity machining on smooth to lightly interrupted cuts. For steels.

WP25CT

Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-ZrCN. Good toughness properties. Excellent first choice for steel machining. Provides high-productivity metal removal for all but the harshest interrupted cuts.

WP35CT

Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-ZrCN. Proven on all roughing and heavy roughing operations, wet or dry, on interrupted and uninterrupted cuts.

WM25CT

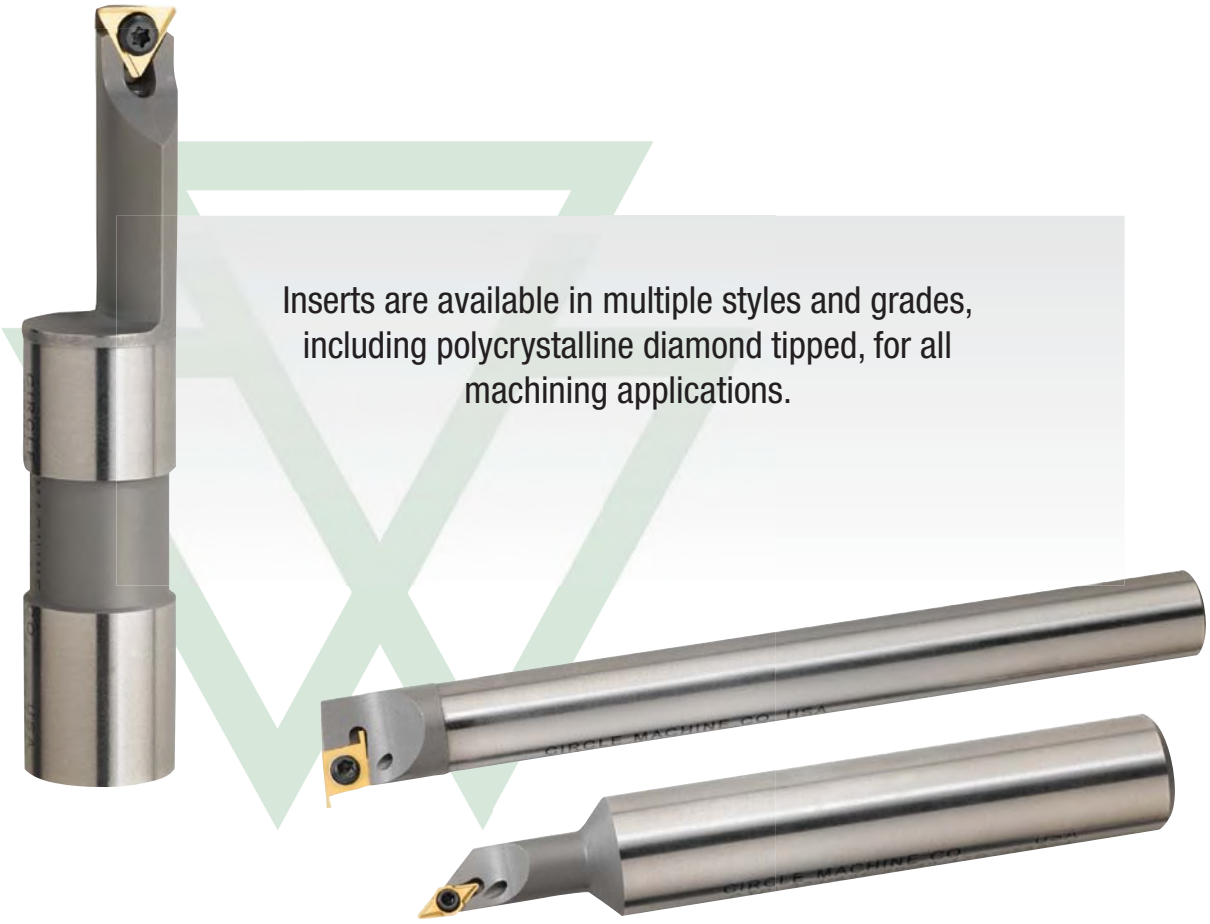
Coated carbide. MT-CVD/CVD — TiN-TiCN-Al_2O_3-ZrCN. Good balance of wear resistance and toughness properties. Light and medium machining. For austenitic stainless steel AISI series.

For more information on heavy-duty tooling, contact your local sales representative.

Small Hole Boring

Micro Boring Bars

The WIDIA™ line of micro boring bars provides accurate holemaking tooling in diameters as small as 4,57mm. These economical, indexable inserts are available in both steel and carbide shanks and are stocked in both metric and inch sizes. Ideal for a wide range of applications, including precision micro boring.



Inserts are available in multiple styles and grades, including polycrystalline diamond tipped, for all machining applications.

I.D. INDEXABLE INSERT TOOLING

80° DIAMOND INSERT BORING BARS

- Available in shanks as small as 4mm to bore >4,57mm diameter.
- Positive rake geometry for free cutting.
- Superior, unobstructed chip evacuation.
- Stocked in multiple grades to bore a wide range of materials.

THREADING AND GROOVING BORING BARS

- Easy insert changes for threading and grooving.
- Thread down to a 48 TPI, 1,3mm TP (pitch).
- Thread and groove capabilities to an inside bore diameter of 6,91mm.

TRIANGLE INSERT BORING BARS

- Designed for less obstruction and greater chip evacuation.
- Positive rake geometry to bore holes >6,98mm diameter.
- Stocked in all grades, including diamond-tipped and borazon-tipped styles.
- Stocked in shanks as small as 6mm for 7,06mm minimum bore diamter.

APPLICATIONS

BORING

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

ENERGY

AEROSPACE

MEDICAL

Choosing the Correct Small Hole Boring Bar

1 Check the Hole Size to be bored (D min) in the component.
(To check suitability of the product platform)

2 Determine boring bar (D).

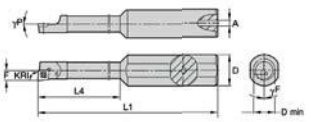
A Select shank size (D) based on your machine's requirements.

B Determine bore depth (how far the boring bar extends from the holder). Multiply bar diameter by 4. If bore depth is less, use a steel bar. If bore depth exceeds 4:1 ratio, use a carbide bar. Use L1 or L4 depending on bar selected. (See recommended maximum overhang chart on page E297.) For indexable tooling, go to step 3. For all other tooling systems, go directly to step 4.

C Determine lead angle (KRA). Zero degree lead angle is used when maximum stability is required. Lead angle may vary based on changing conditions, such as boring in a blind hole.

Small Hole Boring Bars for Turning

CCBM • STEPPED



order number	catalogue number	KRA	D	D min	F	L1	L4	A	γF°	γP°	gage insert
right hand											
3896015	CCBM4816225R	95	16,00	5,28	2,64	85,72	22,23	3,18	0,0°	5,0°	CD_S4T002

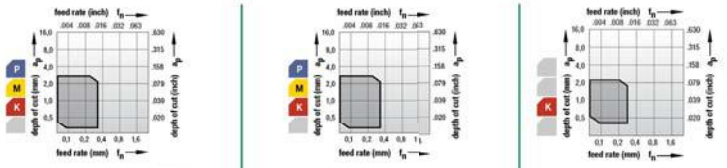
C A B

3 Determine which chipbreaker is best for the material to be machined.

Consult the Small Hole Boring Chipbreaker Geometry charts on page E266.

Small Hole Boring

Chipbreaker Geometries • Single-Sided, Positive Inserts



..HB
Flat inserts. Peripheral ground for best surface quality and reduced cutting pressure. Very stable cutting edge offers maximum rigidity.

..HT
Peripheral ground insert chipbreaker. Good chip control. Geometry for general-purpose applications.

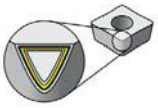
..HB-M
Cubic Boron Nitride (CBN) or Polycrystalline Diamond (PCD) tip for high-temp alloys and non-ferrous machining. Very stable cutting edge offers maximum rigidity.

4 Determine which grade is best for the material to be machined.

Consult the Grades and Grade Descriptions charts on pages E268–E269.

Grades and Grade Descriptions

Small Hole Boring Inserts



Coatings provide high-speed capability and are engineered for finishing to light roughing.

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-Ferrous
- S High-Temp Alloys
- H Hardened Materials

wear resistance ← → toughness

Coating	Grade Description	05	10	15	20	25	30	35	40	45
CM1 HW-S25	Uncoated carbide. A very tough, ultra-fine grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates. Use when C2, C3, or C25 fail due to chipping or breaking.									

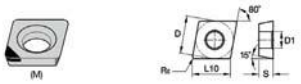
Choosing the Correct Small Hole Boring Bar

(continued)

5 Select the appropriate insert based on style, grade, and geometry.

Small Hole Boring • Positive Inserts

CDHB



● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P			●	○	●	○	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	max DOC	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CDHBS4T0X0	3,97	4,03	1,02	0,05	2,13	–	•	2530897	•	3584731	•	2530868	2530861	•	•	•	•
CDHBS4T0X0M	3,97	4,03	1,02	0,05	2,13	1,90	•	•	•	•	•	•	•	•	•	2530746	•
CDHBS4T002	3,97	4,03	1,02	0,18	2,13	–	•	2530864	•	3584732	•	2530863	2530848	•	2530843	•	•
CDHBS4T002M	3,97	4,03	1,02	0,18	2,13	0,96	•	•	•	•	•	•	•	•	•	2530741	•
CDHBS4T004	3,97	4,03	1,02	0,38	2,13	–	•	2530830	•	2530788	•	2530817	2530813	•	2530803	•	•

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalog number.

6 Determine the Speed and Feed Chart with the appropriate cutting data.

A Based on grade and edge geometry, identify starting speed (vc) and feed (fz). The first choice starting feed is in bold.

B Use the corresponding speed located in the same column below the feed information.

Speed and Feed Chart

Positive Inserts • Metric

Cutting Speed – vc m/min

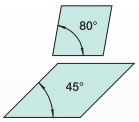
Material Group		C2 min	C2 Start	C2 max	C25 min	C25 Start	C25 max	C3 min	C3 Start	C3 max	CG5 min	CG5 Start	CG5 max	CG55 min	CG55 Start	CG55 max	min
P	ap [mm]	–	–	–	–	–	–	–	–	–	0,051	–	0,300	0,051	–	0,300	0,051
	f [mm/rev]	–	–	–	–	–	–	–	–	–	0,025	–	0,300	0,025	–	0,300	0,025
	0/1	–	–	–	–	–	–	–	–	–	95	**115**	140	105	**130**	155	125
	A 2	–	–	–	–	–	–	–	–	–	60	B **75**	90	65	**85**	100	80
	3	–	–	–	–	–	–	–	–	–	60	**75**	90	65	**85**	100	80
	4	–	–	–	–	–	–	–	–	–	45	**60**	70	50	**65**	80	65
	5	–	–	–	–	–	–	–	–	–	60	**75**	90	65	**85**	100	80
	6	–	–	–	–	–	–	–	–	–	40	**50**	60	45	**55**	70	55
M	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025
	1	55	**70**	80	60	**80**	95	60	**80**	95	75	**90**	110	80	**100**	120	95
	2	50	**60**	75	55	**70**	85	55	**70**	85	65	**80**	100	75	**90**	110	85
	3	35	**45**	55	45	**50**	65	45	**50**	65	50	**60**	75	55	**65**	80	60
K	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025
	1	50	**65**	80	60	**70**	85	60	**70**	85	60	**75**	90	65	**80**	100	75
	2	65	**80**	100	75	**90**	110	75	**90**	110	75	**95**	115	85	**105**	125	95
	3	50	**60**	75	55	**65**	80	55	**65**	80	55	**70**	80	60	**75**	90	65
N	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–
	1	400	**505**	605	400	**505**	605	400	**505**	605	400	**505**	605	445	**555**	665	–
	2	295	**370**	440	295	**370**	445	295	**370**	445	295	**370**	445	325	**405**	490	–
	3	70	**85**	105	70	**85**	105	70	**85**	105	85	**105**	125	90	**115**	135	–
	4	310	**380**	465	310	**385**	465	310	**385**	465	140	**175**	210	155	**190**	230	–
	5	145	**185**	220	145	**185**	220	145	**185**	220	175	**220**	265	195	**240**	290	–
	6	140	**175**	210	140	**175**	210	140	**175**	210	170	**210**	255	185	**235**	280	–
	7	240	**295**	355	240	**300**	360	240	**300**	360	245	**305**	365	265	**335**	400	–
S	ap [mm]	0,025	–	0,200	0,025	–	0,200	0,025	–	0,200	0,025	–	0,200	0,025	–	0,200	–
	f [mm/rev]	0,025	–	0,127	0,025	–	0,127	0,025	–	0,127	0,025	–	0,127	0,025	–	0,127	–
	1	30	**35**	45	30	**35**	45	30	**35**	45	30	**35**	45	35	**40**	50	–
	2	25	**30**	35	25	**30**	35	25	**30**	35	25	**30**	35	25	**35**	40	–
	3	25	**30**	35	25	**30**	35	25	**30**	35	30	**40**	50	35	**45**	55	–
	4	25	**30**	35	25	**30**	35	25	**30**	35	–	–	–	–	–	–	–

Catalog Numbering System

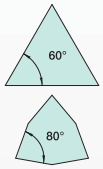
Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

C
Series Type

C



F



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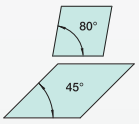
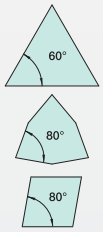
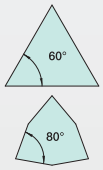


L

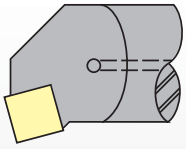
Q



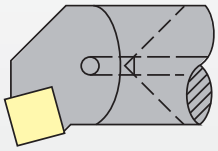
S



S
Bar Type



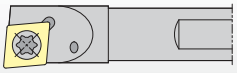
S = Steel
(with coolant)



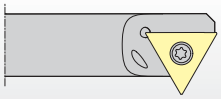
C = Carbide
(with coolant)

B
Bar Style Designation

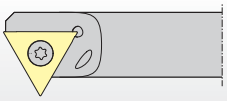
B
Boring Bar



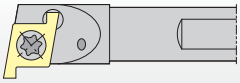
C
External
Chamfering Bar



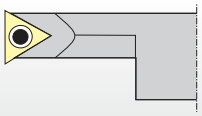
I
Internal
Threading Bar



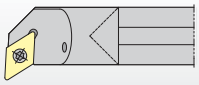
M
Offset Internal
Grooving Bar



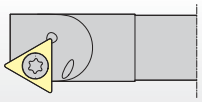
O
Offset Boring Bar



P
Profiling Bar



R
Reverse Chamfer
or Back Chamfer Bar

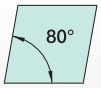


M
Units

M = Metric

Insert Shape (optional)

C



W

Catalog Numbering System

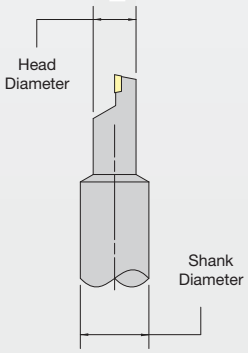
(continued)

52

Head Diameter shown as "D2"

Metric

7 = 6,60mm
8 = 8,18mm/8,20mm
10 = 9,78mm
13 = 12,70mm/ 12,95mm
45 = 4,57mm
48 = 4,80mm
52 = 5,16mm
53 = 5,30mm
64 = 6,60mm
66 = 6,55mm/6,60mm
82 = 8,15mm
95 = 9,50mm
99 = 9,91mm
159 = 15,88mm



NOTE: Only shown on stepped-style bars.

10

Shank Diameter shown as "D"

Metric

4 = 4,00mm
5 = 5,00mm
6 = 6,00mm
8 = 8,00mm
10 = 10,00mm
12 = 12,00mm
16 = 16,00mm

12

Length/Depth shown as "L1/L4"

Bore Length for Step Bars

Thread Depth for Threading Bars

Overall Length for Straight Shank Bars

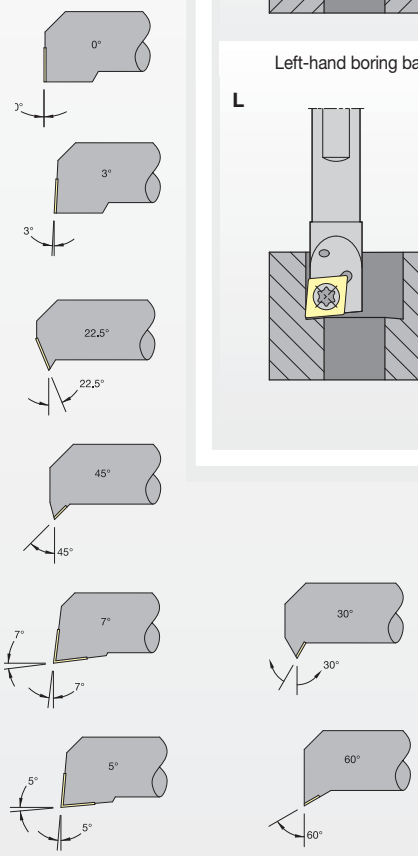
Metric

12 = 12,70mm
19 = 19,05mm
22 = 22,23mm
25 = 25,40mm
32 = 31,75mm
38 = 38,10mm
48 = 47,63mm
51 = 50,80mm
63 = 63,50mm
64 = 64,00mm
76 = 76,00mm
79 = 79,38mm
100 = 100,58mm/ 101,50mm/ 101,60mm
102 = 101,60mm
127 = 127,00mm
152 = 152,00mm 152,40mm
178 = 177,80mm 179,90mm
203 = 203,20mm
254 = 254,00mm

5

Lead Angle*

0 = 90° Used for Threading/ Grooving Bars
3 = 3°
5 = 5°
7 = 7°
225 = 22.5°
30 = 30°
45 = 45°
60 = 60°



*NOTE: Shown as "KRI" for metric bars.

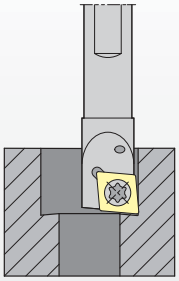
R

Hand of Tool

R = Right hand
L = Left hand

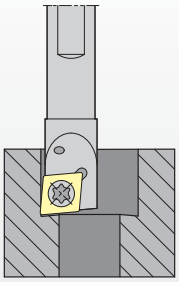
Right-hand boring bar

R



Left-hand boring bar

L



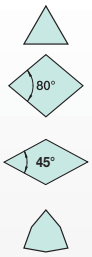
Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

C

Insert Shape

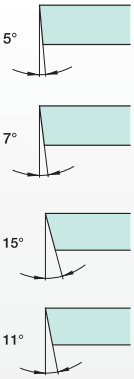
T 60°
C 80°
G 45°
W 80°



D

Insert Clearance Angle

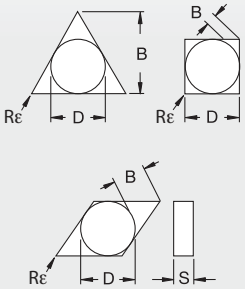
B 5°
C 7°
D 15°
P 11°



H

Tolerance Class

Tolerances apply prior to edge prep and coating.



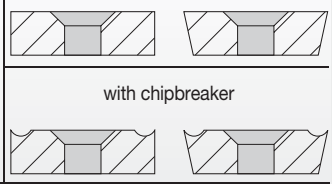
D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	See tables on next page		±0,013
U	See tables on next page		±0,013

B

Insert Features

Partly cylindrical hole, 40–60° countersink, single-sided	W	without chipbreaker
	T	with chipbreaker
Partly cylindrical hole, 70–90° countersink, single-sided	B	without chipbreaker
	H	with chipbreaker



S4

Size

"D" mm	Code for metric cutting edge length "L10" C	G	T	W
3,97	S4	05	06	—
4,06	—	—	07	—
4,76	04	06	08	S3
6,35	06	—	11	04
9,53	09	—	16	06
9,80	—	—	17	—

Catalog Numbering System

(continued)

T0

Thickness

symbol mm	thickness mm
T0	1,00; 1,02
01	1,59; 1,58
T1	1,98; 1,91
02	2,38; 2,36
03	3,18
T3	3,97
S1	1,19

02

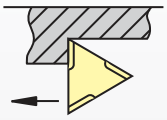
Corner Radius "Rε"

symbol mm	corner radius mm
X0	0,04; 0,05
01	0,1
02	0,2; 0,18
04	0,4; 0,38
05	0,5
08	0,8
09	0,9
12	1,2
16	1,6

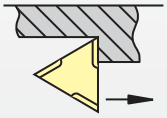
Hand of Insert *(optional)*

R = Right hand

L = Left hand



R



L

Cutting Edge Condition or Chip Control Features *(optional)*

HP = High positive

LF = Light finishing

Tip Style *(optional)*

Symbol

M

Usage

Mini tip

"D" mm	± Tolerance on "D" Class M Tolerance Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Class U Tolerance Shapes S, T, & C mm
3,97	0,05	–	–	–
4,76	0,05	–	–	0,08
5,56	0,05	0,05	0,05	0,08
6,35	0,05	0,05	0,05	0,08
7,94	0,05	0,05	0,05	0,08
9,52	0,05	0,05	0,05	0,08
11,11	0,08	0,08	0,08	0,13
12,70	0,08	0,08	0,08	0,13
14,29	0,08	0,08	0,08	0,13
15,88	0,10	0,10	0,10	0,18
17,46	0,10	0,10	0,10	0,18
19,05	0,10	0,10	0,10	0,18
22,22	0,13	–	–	0,25
25,40	0,13	–	–	0,25
31,75	0,15	–	–	0,25

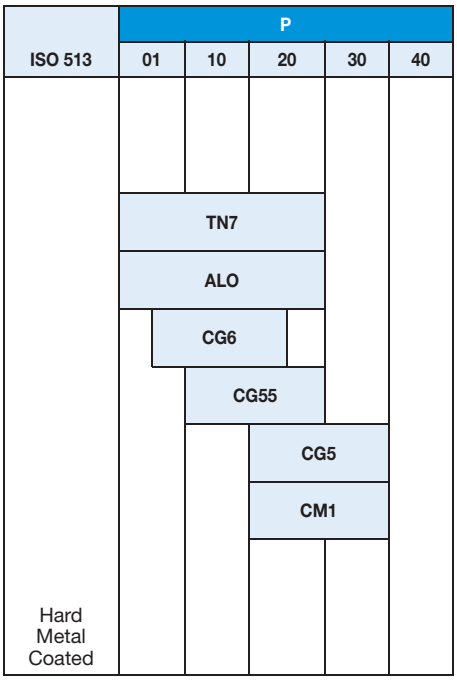
"D" mm	± Tolerance on "B" Class M Tolerance Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Class U Tolerance Shapes S, T, & C mm
3,97	0,08	–	–	–
4,76	0,08	–	–	0,13
5,56	0,08	0,11	–	0,13
6,35	0,08	0,11	–	0,13
7,94	0,08	0,11	–	0,13
9,52	0,08	0,11	0,18	0,13
11,11	0,13	0,15	–	–
12,70	0,13	0,15	0,25	0,20
14,29	0,13	0,15	–	–
15,88	0,15	0,18	–	0,27
17,46	0,15	0,18	–	0,27
19,05	0,15	0,18	–	0,27
22,22	0,15	–	–	0,38
25,40	0,18	–	–	0,38
31,75	0,20	–	–	0,38

The WIDIA™ three-step insert selection system makes choosing and applying the most productive tool easy. Tool recommendations are based on six workpiece material groups.

1 **Select the Insert Geometry:**
Based on the needed depth of cut and feed rate, choose the geometry that best matches your needs.

2 **Select the Grade:**
Determine your cutting conditions, and choose the proper grade.

TN7–CM1 for Steel



wear resistance = harder

TN7 — High edge strength and wear-resistant cermet. Finishing to semi-finishing of carbon, alloy, and stainless steels at medium to high speeds.

ALO — Can withstand light interruptions. Alumina coating enables higher cutting speeds.

CG6 — High-speed, general-purpose grade for all kinds of steel and cast iron.

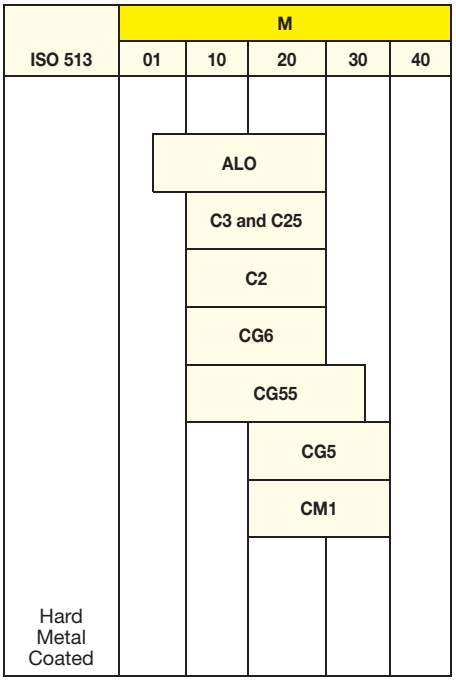
CG55 — High edge strength and wear resistance. Reduces problems with built-up edge. Superior thermal deformation resistance and depth-of-cut notch resistance.

CG5 — Best at low speeds. Will handle interruptions and high feed rates.

CM1 — For heavy turning and heavily interrupted cuts.

toughness = softer

ALO–CM1 for Stainless Steel



wear resistance = harder

ALO — Can withstand light interruptions. Alumina coating enables higher cutting speeds.

C3 and C25 — Good wear resistance with some toughness.

C2 — Excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.

CG6 — High-speed, general-purpose grade for all kinds of steel and cast iron.

CG55 — High edge strength and wear resistance. Reduces problems with built-up edge. Superior thermal deformation resistance and depth-of-cut notch resistance.

CG5 — Best at low speeds. Will handle interruptions and high feed rates.

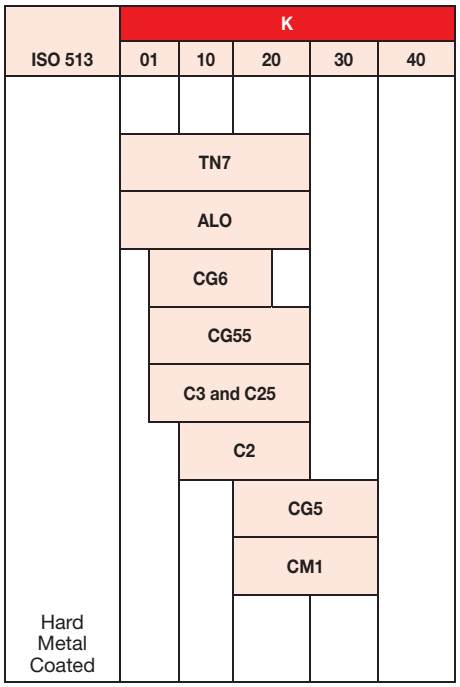
CM1 — For heavy turning and heavily interrupted cuts.

toughness = softer

3 Select the Cutting Speed:
In the foldout speed and feed chart, establish your cutting speed and obtain your optimal starting conditions and range.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

TN7–CM1 for Cast Iron



wear resistance = harder

TN7 — High edge strength and wear-resistant cermet.

ALO — Can withstand light interruptions. Alumina coating enables higher cutting speeds.

CG6 — High-speed, general-purpose grade for all kinds of steel and cast iron.

CG55 — High edge strength and wear resistance. Reduces problems with built-up edge. Superior thermal deformation resistance and depth-of-cut notch resistance.

C3 and C25 — Good wear resistance with some toughness.

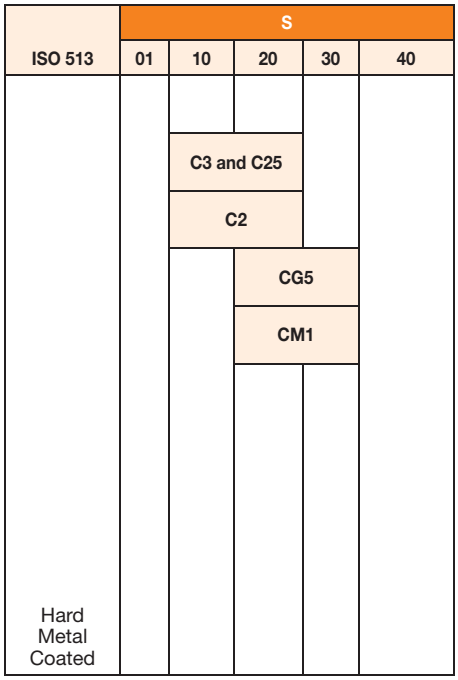
C2 — Excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.

CG5 — Best at low speeds. Will handle interruptions and high feed rates.

CM1 — For heavy turning and heavily interrupted cuts.

toughness = softer

C3–CM1 for High-Temperature Alloys



wear resistance = harder

C3 and C25 — Good wear resistance with some toughness.

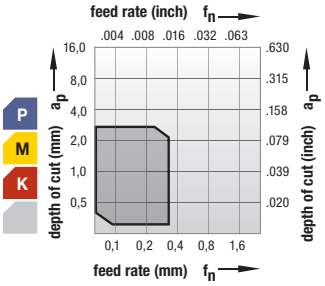
C2 — Excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.

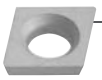
CG5 — Best at low speeds. Will handle interruptions and high feed rates.

CM1 — For heavy turning and heavily interrupted cuts.

toughness = softer

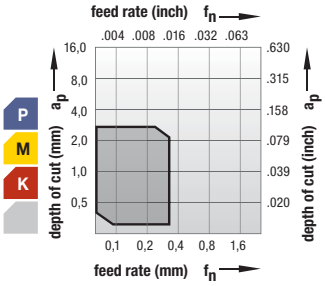
Chipbreaker Geometries • Single-Sided, Positive Inserts





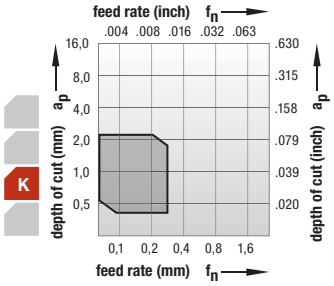
..HB

Flat inserts. Peripheral ground for best surface quality and reduced cutting pressure. Very stable cutting edge offers maximum rigidity.



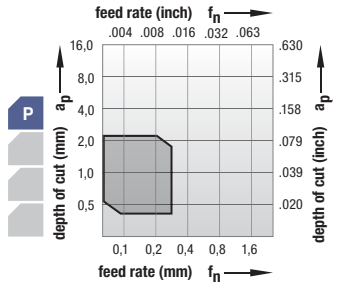
..HT

Peripheral ground insert chipbreaker. Good chip control. Geometry for general-purpose applications.



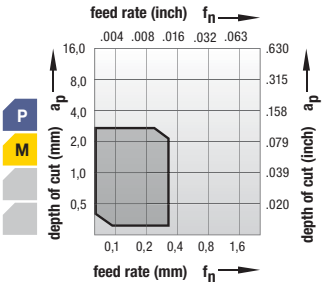
..HB-M

Cubic Boron Nitride (CBN) or Polycrystalline Diamond (PCD) tip for high-temp alloys and non-ferrous machining. Very stable cutting edge offers maximum rigidity.



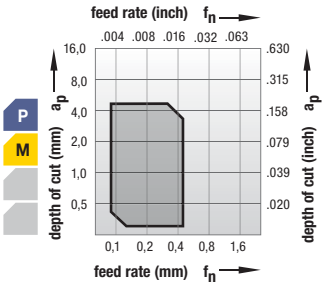
..LF

Geometry for general-purpose applications. Very good chip control. Recommended for general finish machining.



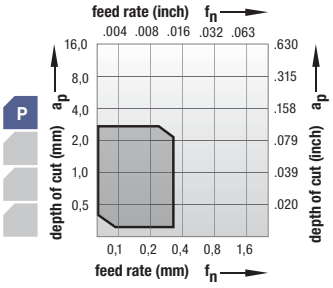
..HH

Peripheral ground for best surface quality and reduced cutting pressure. For fine to medium finishes.



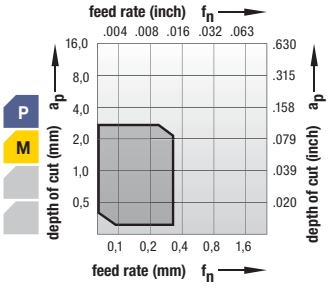
HP

High positive-type chipbreaker. Peripheral ground for best surface quality and reduced cutting pressure. Recommended for high-temp alloys and non-ferrous machining.



..HH-R/L

Ground-in chipbreaker. Peripheral ground for best surface quality and reduced cutting pressure. *Right-hand inserts used in left-hand bars ONLY. Left-hand inserts used in right-hand bars ONLY.



..HW

Flat insert for profiling. Very stable cutting edge offers maximum rigidity.

Chipbreaker Geometries • Geometry Selection Criteria

Flat Top-Type Inserts

Chipbreaker Geometry ..HB, ..HB-M, ..HW

- Suitable for interrupted cuts.
- Use when chip control is not critical.

Pressed Chipbreaker-Type Inserts

Chipbreaker Geometry ..LF

- Suitable for moderate interruption of cuts.
- Use when chip control is a concern.

Pressed Chipbreaker-Type Inserts with Ground Periphery

Chipbreaker Geometry ..HH, ..HT, HP

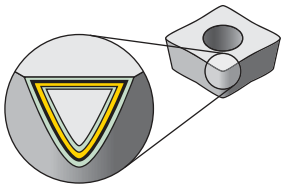
- Suitable for light to moderate interruption of cuts.
- Use when chip control is a concern.
- Superior surface finish and closer tolerance on workpiece.

Ground-In Chipbreaker-Type Inserts

Chipbreaker Geometry ..HH-R/L

- Suitable for smooth cuts.
- Use when chip control is a concern.
- Superior surface finish and closer tolerance on workpiece.

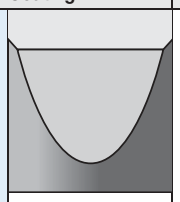
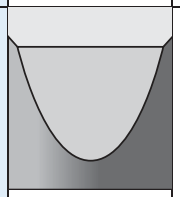
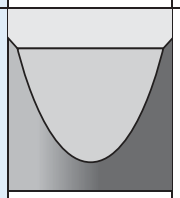
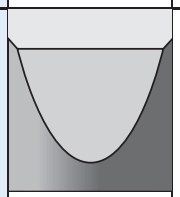
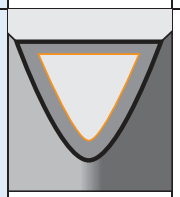
Small Hole Boring Inserts



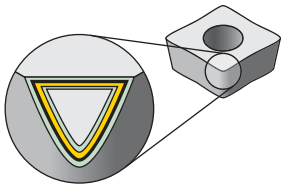
Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
CM1	 HW-S25	Uncoated carbide. A very tough, ultra-fine grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates. Use when C2, C3, or C25 fail due to chipping or breaking.	P									
			M									
			K									
			N									
			S									
C2	 HW-N15	Uncoated carbide. A hard, low binder content, unalloyed WC/Co fine-grained grade. General-purpose grade for non-ferrous materials. Has excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.										
			M									
			K									
			N									
			S									
C3 and C25	 HW-K15	Uncoated carbide. Has excellent abrasion resistance for machining cast irons, aluminum, and non-ferrous metals. Good wear resistance with some toughness. Harder than C2, resulting in greater edge wear resistance. Suitable for finishing operations.										
			M									
			K									
			N									
			S									
TN7	 HT-P15	A highly wear-resistant (TiC/TiN-based) cermet grade. High edge strength and wear-resistant cermet offers improved tool life over uncoated/coated carbides and resists material build-up on cutting edge. Finishing to semi-finishing of carbon, alloy, and stainless steels at medium to high speeds. Can also be used on non-ferrous materials.	P									
			K									
ALO	 HC-K15	Coated carbide. CVD — TiCN-TiC-Al_2O_3. A thin alumina coating over a hard, deformation-resistant substrate. High-speed finishing of gray cast irons and medium-speed finishing of alloy steels that are in a hardness range of 35–50 HRC. Can withstand light interruptions. Alumina coating enables higher cutting speeds.	P									
			M									
			K									

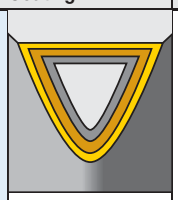
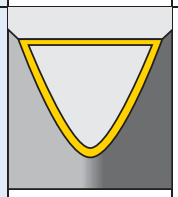
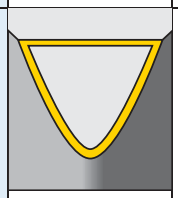
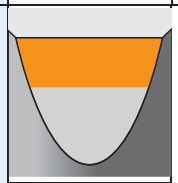
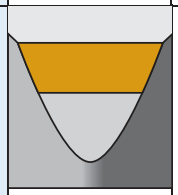
Small Hole Boring Inserts



Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
CG6	 HC-P10	Coated carbide. CVD — TiC-TiCN-TiN. Tri-phase coating on a hard, low binder content, fine-grained grade. High-speed, general-purpose grade for all kinds of steel. Gold in color.	P	■	■	■						
			M		■	■	■					
			K	■	■	■						
CG5	 HC-S25	A PVD-TiN-coated grade. Straight 9.5% Co substrate. Submicron grain. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates.	P				■	■	■			
			M				■	■	■			
			K				■	■	■			
			N				■	■	■			
			S				■	■	■			
CG55	 HC-M20	A PVD-TiN coating over a very wear-resistant, unalloyed carbide substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Grade provides combination of high edge strength and wear resistance. Coating increases wear resistance and reduces problems with built-up edge. The substrate offers superior thermal deformation resistance and depth-of-cut notch resistance.	P		■	■	■					
			M		■	■	■	■				
			K	■	■	■	■					
			S		■	■	■					
CBN6	 BN-H25	PcBN tip brazed onto a carbide insert. Recommended for machining hardened steel (45–65 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings. Can be run both dry and wet.										
			H			■	■	■	■			
CPD1	 DP-N10	Polycrystalline diamond (PCD) compact grade provides exceptional hardness and abrasion resistance. CPD1 is a superior finish boring grade that will significantly improve workpiece tolerances, surface finishes, and insert tool life in high-silicon aluminum, copper, aluminum carbon graphite, hard rubber, plastics, and/or wood.										
			N	■	■	■						

Positive Inserts • Metric

Material Group		Cutting Speed — vc m/min																	
		C2			C25			C3			CG5			CG55			CG6		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	ap [mm]	–	–	–	–	–	–	–	–	–	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300
	f [mm/rev]	–	–	–	–	–	–	–	–	–	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300
	0/1	–	–	–	–	–	–	–	–	–	95	**115**	140	105	**130**	155	125	**155**	190
	2	–	–	–	–	–	–	–	–	–	60	**75**	90	65	**85**	100	80	**100**	125
	3	–	–	–	–	–	–	–	–	–	60	**75**	90	65	**85**	100	80	**100**	125
	4	–	–	–	–	–	–	–	–	–	45	**60**	70	50	**65**	80	65	**80**	95
	5	–	–	–	–	–	–	–	–	–	60	**75**	90	65	**85**	100	80	**100**	125
	6	–	–	–	–	–	–	–	–	–	40	**50**	60	45	**55**	70	55	**65**	80
M	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300
	1	55	**70**	80	60	**80**	95	60	**80**	95	75	**90**	110	80	**100**	120	95	**115**	140
	2	50	**60**	75	55	**70**	85	55	**70**	85	65	**80**	100	75	**90**	110	85	**105**	125
	3	35	**45**	55	45	**50**	65	45	**50**	65	50	**60**	75	55	**65**	80	60	**80**	95
K	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300
	1	50	**65**	80	60	**70**	85	60	**70**	85	60	**75**	90	65	**80**	100	75	**90**	110
	2	65	**80**	100	75	**90**	110	75	**90**	110	75	**95**	115	85	**105**	125	95	**115**	140
	3	50	**60**	75	55	**65**	80	55	**65**	80	55	**70**	80	60	**75**	90	65	**85**	100
N	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–
	1	400	**505**	605	400	**505**	605	400	**505**	605	400	**505**	605	445	**555**	665	–	–	–
	2	295	**370**	440	295	**370**	445	295	**370**	445	295	**370**	445	325	**405**	490	–	–	–
	3	70	**85**	105	70	**85**	105	70	**85**	105	85	**105**	125	90	**115**	135	–	–	–
	4	310	**380**	465	310	**385**	465	310	**385**	465	140	**175**	210	155	**190**	230	–	–	–
	5	145	**185**	220	145	**185**	220	145	**185**	220	175	**220**	265	195	**240**	290	–	–	–
	6	140	**175**	210	140	**175**	210	140	**175**	210	170	**210**	255	185	**235**	280	–	–	–
	7	240	**295**	355	240	**300**	360	240	**300**	360	245	**305**	365	265	**335**	400	–	–	–
S	ap [mm]	0,025	–	0,200	0,025	–	0,200	0,025	–	0,200	0,025	–	0,200	0,025	–	0,200	–	–	–
	f [mm/rev]	0,025	–	0,127	0,025	–	0,127	0,025	–	0,127	0,025	–	0,127	0,025	–	0,127	–	–	–
	1	30	**35**	45	30	**35**	45	30	**35**	45	30	**35**	45	35	**40**	50	–	–	–
	2	25	**30**	35	25	**30**	35	25	**30**	35	25	**30**	35	25	**35**	40	–	–	–
	3	25	**30**	35	25	**30**	35	25	**30**	35	30	**40**	50	35	**45**	55	–	–	–
	4	25	**30**	35	25	**30**	35	25	**30**	35	–	–	–	–	–	–	–	–	–
H	ap [mm]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	f [mm/rev]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

NOTE: Speed and feed rates and depth of cut may vary depending on materials and machining conditions including, but not limited to, tool overhang, tool size, and finished surface requirements.

Positive Inserts • Metric

		Cutting Speed — vc m/min														
		CM1			ALO			TN7			CBN6			CPD1		
	Material Group	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–	–	–	–
	0/1	55	**65**	80	165	**205**	245	200	**245**	295	–	–	–	–	–	–
	2	35	**45**	55	105	**135**	160	130	**160**	190	–	–	–	–	–	–
	3	35	**45**	55	105	**135**	160	130	**160**	190	–	–	–	–	–	–
	4	25	**35**	40	85	**105**	125	100	**125**	150	–	–	–	–	–	–
	5	35	**45**	55	105	**135**	160	130	**160**	190	–	–	–	–	–	–
	6	25	**30**	35	70	**90**	105	85	**105**	130	–	–	–	–	–	–
M	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–	–	–	–
	1	55	**65**	80	105	**130**	160	105	**130**	155	–	–	–	–	–	–
	2	50	**60**	75	95	**120**	145	95	**115**	140	–	–	–	–	–	–
	3	35	**45**	55	70	**90**	110	70	**85**	105	–	–	–	–	–	–
K	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–	–	–	–
	1	45	**60**	70	125	**155**	185	80	**105**	125	–	–	–	–	–	–
	2	60	**75**	90	160	**200**	240	105	**130**	160	–	–	–	–	–	–
	3	45	**55**	65	115	**145**	170	80	**95**	115	–	–	–	–	–	–
N	ap [mm]	0,051	–	0,300	–	–	–	0,051	–	0,300	–	–	–	0,051	–	0,300
	f [mm/rev]	0,025	–	0,300	–	–	–	0,025	–	0,300	–	–	–	0,025	–	0,300
	1	400	**505**	605	–	–	–	400	**505**	605	–	–	–	855	**1065**	1280
	2	295	**370**	445	–	–	–	295	**370**	445	–	–	–	650	**810**	975
	3	70	**85**	105	–	–	–	80	**100**	120	–	–	–	365	**455**	550
	4	100	**125**	150	–	–	–	195	**240**	290	–	–	–	325	**405**	490
	5	145	**185**	220	–	–	–	195	**245**	295	–	–	–	340	**425**	510
	6	140	**175**	210	–	–	–	175	**220**	265	–	–	–	335	**420**	505
	7	240	**295**	360	–	–	–	240	**300**	365	–	–	–	525	**660**	790
S	ap [mm]	0,025	–	0,200	–	–	–	–	–	–	0,025	–	0,200	–	–	–
	f [mm/rev]	0,025	–	0,127	–	–	–	–	–	–	0,025	–	0,127	–	–	–
	1	25	**30**	40	–	–	–	–	–	–	90	**110**	135	–	–	–
	2	20	**25**	30	–	–	–	–	–	–	70	**85**	105	–	–	–
	3	25	**35**	40	–	–	–	–	–	–	100	**120**	145	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
H	ap [mm]	–	–	–	–	–	–	–	–	–	0,025	–	0,200	–	–	–
	f [mm/rev]	–	–	–	–	–	–	–	–	–	0,025	–	0,127	–	–	–
	1	–	–	–	–	–	–	–	–	–	110	**135**	165	–	–	–
	2	–	–	–	–	–	–	–	–	–	105	**130**	155	–	–	–
	3	–	–	–	–	–	–	–	–	–	100	**120**	145	–	–	–
	4	–	–	–	–	–	–	–	–	–	90	**110**	135	–	–	–

NOTE: Speed and feed rates and depth of cut may vary depending on materials and machining conditions including, but not limited to, tool overhang, tool size, and finished surface requirements.

Insert Cross Reference Chart

WIDIA-CIRCLE™ catalog number	New ISO/ANSI catalog number
CDCD	CDHB
CDCG	CDHH
CDCT	CDHH
CPCA	CPHB
CPCM	CPHH
GCCD	GCHW
GCCT	GCHT
GPCD	GPHW
GPCT	GPHT
TD6P	TPHB
TDAB	TDHB
TDAT	TDHH
TDCG	TDHH
TPCB	TPHB
TPCG	TPHH
TPCH	TPHH
TPGH	TPHH
TPMT	TPMT
WPGT	WPHT

Hardware

Insert Screws

order number	ISO catalogue number	Torx/hex	internal thread
2840098	MSM46	2 mm	M4X0.7
2892513	BS832	5/64	—
2832635	CT11	T6	#1-72
2830477	FC11	T7	—
2828337	GT21	T7	#2-56
2825941	QTM20	T7	M2.5X0.45
2825948	QTM26	T7	M2.5X0.45
2826005	QC15	T8	#3-48
2826038	QC21	T9	#4-40
2823203	STM31	T15	M3.5 X 0.6
2832641	CT15	T16	#1-72

Wrenches

order number	ISO catalogue number	Torx/hex
2832628	CKEY	T6
2830492	FKEY	T7
2825982	QKEY	T9
2823182	SKEY	T10

Drive Bits

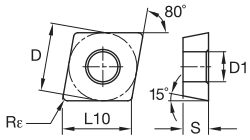
order number	ISO catalogue number	Torx/hex
2832661	CBIT	T6
2830497	FBIT	T7

Wedges

order number	ISO catalogue number
2840192	AW250/AW-250

CDHB

(M)



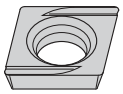
● first choice
○ alternate choice

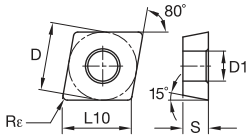
	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	max DOC	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CDHBS4T0X0	3,97	4,03	1,02	0,05	2,13	—	-	2830897	-	3884731	-	2830888	2830881	-	-	-	-
CDHBS4T0X0M	3,97	4,03	1,02	0,05	2,13	1,90	-	-	-	-	-	-	-	-	-	2830746	-
CDHBS4T002	3,97	4,03	1,02	0,18	2,13	—	-	2830864	-	3884732	-	2830853	2830848	-	2830843	-	-
CDHBS4T002M	3,97	4,03	1,02	0,18	2,13	0,96	-	-	-	-	-	-	-	-	-	2830741	-
CDHBS4T004	3,97	4,03	1,02	0,38	2,13	—	-	2830830	-	2830788	-	2830817	2830813	-	2830803	-	-

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalog number.

CDHH • R/L



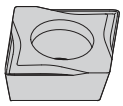


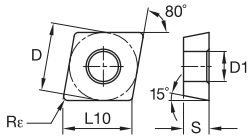
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
CDHHS4T002R	3,97	4,03	1,02	0,18	2,13	-	-	-	2830731	-	-	2830706	-	-	-	-
CDHHS4T004R	3,97	4,03	1,02	0,38	2,13	-	-	-	2830682	-	-	-	-	-	-	-
left hand																
CDHHS4T002L	3,97	4,03	1,02	0,18	2,13	-	-	-	2830724	-	2830712	2830700	-	-	-	-
CDHHS4T004L	3,97	4,03	1,02	0,38	2,13	-	-	-	2830678	-	-	-	-	-	-	-

CDHH



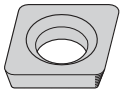


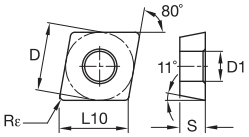
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
neutral hand																
CDHHS4T002	3,97	4,03	1,02	0,18	2,13	-	-	-	2830632	-	-	2830638	-	-	-	-
CDHHS4T004	3,97	4,10	1,02	0,38	2,13	-	-	-	2830619	-	-	-	-	-	-	-

CPHB



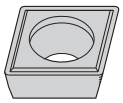


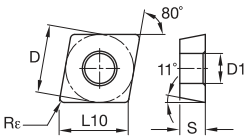
● first choice
○ alternate choice

P				●	○	●	○	○	●			
M	○	○	○	●	●	○	○	○	○			
K	○	●	●	○	○	○	○	●	○			
N	●	●	●	●	○		○		○			●
S	○	○	○	●	○		●					
H											●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CPHB06T102	6,35	6,45	1,90	0,18	2,79	'	'	'	2824583	'	'	'	'	'	'	'
CPHB06T104	6,35	6,45	1,90	0,38	2,79	'	'	'	2824562	'	'	'	'	'	'	'

CPHH



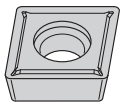


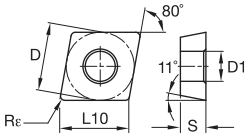
● first choice
○ alternate choice

P				●	○	●	○	○	●			
M	○	○	○	●	●	○	○	○	○			
K	○	●	●	○	○	○	○	●	○			
N	●	●	●	●	○		○		○			●
S	○	○	○	●	○		●					
H											●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CPHH06T102	6,35	6,45	1,91	0,18	2,79	'	'	'	2824461	'	2824454	'	'	'	'	'
CPHH06T104	6,35	6,45	1,91	0,38	2,80	'	'	'	2824441	'	'	'	'	'	'	'

CPMT-LF



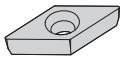


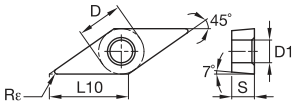
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CPMT09T302LF	9,53	9,67	3,97	0,20	4,40	●	●	●	2821519	●	●	●	●	●	●	●
CPMT09T304LF	9,53	9,67	3,97	0,40	4,40	●	●	●	2821499	●	●	●	●	●	●	●
CPMT09T308LF	9,53	9,67	3,97	0,80	4,40	●	●	●	2821484	●	●	●	●	●	●	●

GCHW



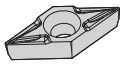


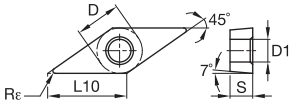
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GCHW060202	4,76	6,73	2,36	0,18	2,39	●	●	●	2827596	●	●	2827601	●	●	●	●
GCHW060204	4,76	6,73	2,36	0,38	2,39	●	●	●	2827577	●	●	2827584	●	●	●	●

GCHT



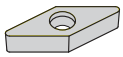


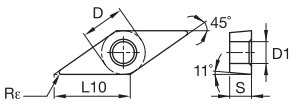
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GCHT060202	4,83	6,83	2,36	0,18	2,39	-	-	-	2827537	-	-	-	-	-	-	-
GCHT060204	4,76	6,83	2,36	0,38	2,39	-	-	-	2827525	-	-	2827531	-	-	-	-

GPHW



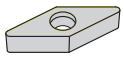


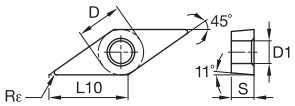
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GPHW050102	3,97	5,61	1,59	0,18	2,13	-	-	-	2827631	-	2827625	2827637	-	-	-	-
GPHW050104	3,97	5,61	1,59	0,38	2,13	-	-	-	2827615	-	2827608	2827621	-	-	-	-

GPHT



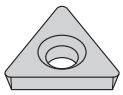


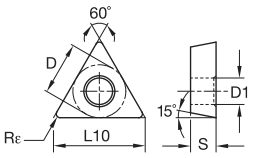
● first choice
○ alternate choice

P				●	○	●	○	○	●			
M	○	○	○	●	●	○	○	○	○			
K	○	●	●	○	○	○	○	●	○			
N	●	●	●	●	○		○		○			●
S	○	○	○	●	○		●					
H											●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GPHT050102	3,97	5,76	1,57	0,18	2,13	-	-	-	2827560	-	-	2827566	-	-	-	-
GPHT050104	4,08	5,76	1,57	0,38	2,13	-	-	-	2827548	-	-	2827554	-	-	-	-

TBHB



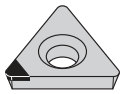


● first choice
○ alternate choice

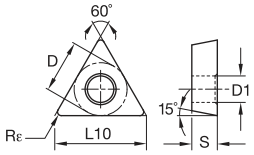
P				●	○	●	○	○	●			
M	○	○	○	●	●	○	○	○	○			
K	○	●	●	○	○	○	○	●	○			
N	●	●	●	●	○		○		○			●
S	○	○	○	●	○		●					
H											●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TBHB07S1X0	4,06	7,04	1,19	0,05	2,39	-	-	-	2828556	-	-	-	-	-	-	-
TBHB110201	6,35	11,00	2,38	0,10	3,33	-	-	-	2824266	-	-	-	-	-	-	-

TDHB



(M)



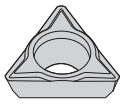
● first choice
○ alternate choice

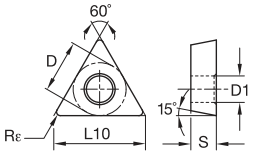
	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	max DOC	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TDHB07S102M	4,06	7,04	1,19	0,18	2,39	1,27	-	-	-	-	-	-	-	-	-	2828579	-
TDHB07S104M	4,06	7,04	1,19	0,38	2,39	1,27	-	-	-	-	-	-	-	-	-	2828634	-
TDHB07S1X0	4,06	7,04	1,19	0,05	2,41	—	-	2828784	-	2828796	-	-	2828778	-	-	-	-
TDHB07S102	4,06	7,04	1,19	0,18	2,41	—	-	2828732	-	2828755	-	2828749	2828727	-	2828720	-	-
TDHB07S104	4,06	7,04	1,19	0,38	2,41	—	-	2828697	-	2828708	-	2828702	2828693	-	2828688	-	-
TDHB07S108	4,06	7,04	1,19	0,79	2,41	—	-	-	-	2828682	-	-	-	-	-	-	-

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalog number.

TDHH





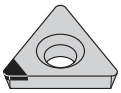
● first choice
○ alternate choice

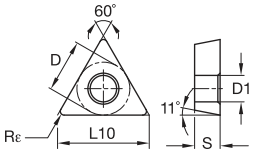
	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	max DOC	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TDHH07S102	4,06	7,04	1,19	0,18	2,41	—	'	'	'	2828398	'	'	'	'	'	'	'
TDHH07S102L	4,06	7,04	1,19	0,18	2,41	4,52	'	'	'	2828541	'	2828529	2828516	'	2828508	'	'
TDHH07S102R	4,06	7,04	1,19	0,18	2,41	4,52	'	'	'	2828547	'	'	'	'	'	'	'
TDHH07S104L	4,06	7,04	1,19	0,38	2,41	4,36	'	'	'	2828494	'	'	2828472	'	'	'	'
TDHH07S104R	4,06	7,04	1,19	0,38	2,41	4,36	'	'	'	2828499	'	'	'	'	'	'	'
TDHH07S104	4,06	7,18	1,19	0,38	2,41	—	'	'	'	2828386	'	'	'	'	'	'	'

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalog number.

TPHB





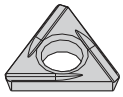
● first choice
○ alternate choice

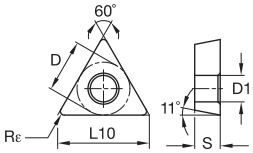
P				●	○	●	○	○	●			
M		○	○	○	●	●	○	○	○	○		
K		○	●	●	○	○	○	○	●	○		
N		●	●	●	●	○		○		○		●
S		○	○	○	●	○		●				
H											●	

ISO catalogue number	D	L10	S	Rε	D1	max DOC	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPHB1102X0	6,35	11,00	2,38	0,05	3,30	–	-	-	2824236	2824251	-	-	2824220	-	-	-	-
TPHB1102X0M	6,35	11,00	2,38	0,05	3,30	1,62	-	-	-	-	-	-	-	-	-	2823954	-
TPHB110202	6,35	11,00	2,38	0,18	3,30	–	-	-	2824191	2824200	-	2824195	2824168	-	2824148	-	-
TPHB110202M	6,35	11,00	2,38	0,18	3,30	1,62	-	-	-	-	-	-	-	-	-	2823949	-
TPHB110204M	6,35	11,00	2,38	0,40	3,30	1,62	-	-	-	-	-	-	-	-	-	2823942	-
TPHB110204	6,35	11,00	2,38	0,38	3,30	–	-	-	2824122	2824136	-	2824129	2824104	-	2824090	-	-
TPHB110208	6,35	11,00	2,38	0,79	3,30	–	-	-	-	2824077	-	-	2824044	-	2824037	-	-
TPHB1603X0	9,53	16,50	3,18	0,05	3,30	–	-	-	-	2821402	-	-	2821844	-	-	-	-
TPHB160302	9,53	16,50	3,18	0,18	3,30	–	-	-	-	2821397	-	-	2821816	-	-	-	-
TPHB160304	9,53	16,50	3,18	0,38	3,30	–	-	-	-	2821392	-	2821778	2821772	-	2821749	-	-
TPHB160308	9,53	16,50	3,18	0,79	3,30	–	-	-	-	2821381	-	2821377	2821349	-	2821331	-	-
TPCB160302	9,53	–	3,23	0,18	3,30	–	-	-	-	-	-	2821822	-	-	-	-	-

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalog number.

TPHH • R/L



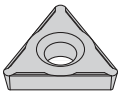


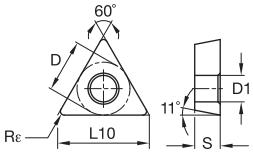
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
TPHH110202R	6,35	11,00	2,38	0,18	3,33	-	-	-	2823812	-	-	-	-	-	-	-
TPHH160302R	9,53	16,50	3,18	0,18	3,33	-	-	-	2821213	-	-	-	-	-	-	-
TPHH160304R	9,53	16,50	3,18	0,38	3,33	-	-	-	2821168	-	-	-	-	-	-	-
TPHH160308R	9,53	16,50	3,18	0,79	3,33	-	-	-	2821121	-	-	-	-	-	-	-
left hand																
TPHH110202L	6,35	11,00	2,38	0,18	3,33	-	-	-	2823805	-	-	-	-	2823767	-	-
TPHH110204L	6,35	11,00	2,38	0,38	3,33	-	-	-	2823753	-	2823739	-	-	-	-	-
TPHH160302L	9,53	16,50	3,18	0,18	3,33	-	-	-	2821208	-	-	-	-	-	-	-
TPHH160304L	9,53	16,50	3,18	0,38	3,33	-	-	-	2821162	-	2821150	-	-	-	-	-
TPHH160308L	9,53	16,50	3,18	0,79	3,33	-	-	-	2821115	-	-	-	-	-	-	-

TPHH



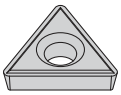


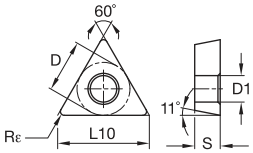
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPHH110202	6,35	11,00	2,38	0,18	3,30	-	-	-	2823914	-	2823908	-	-	-	-	-
TPHH110204	6,35	11,00	2,38	0,38	3,30	-	-	-	2823858	-	-	-	-	-	-	-
TPCH110204	6,50	11,26	2,38	0,38	3,30	-	-	-	-	-	2823851	-	-	-	-	-

TPHH-LF



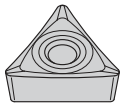


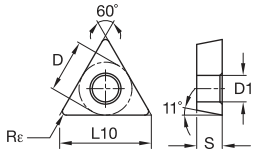
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPHH160304	9,53	16,50	3,18	0,40	3,33	-	-	-	2821070	-	2821705	-	-	-	-	-
TPHH160304LF	9,53	16,50	3,18	0,40	3,33	-	2821718	-	-	-	-	-	-	-	-	-
TPHH160308	9,53	16,50	3,18	0,79	3,33	-	-	-	2821067	-	-	-	-	-	-	-
TPHH160308	9,53	16,50	3,18	0,79	3,33	-	-	-	-	-	2821670	-	-	-	-	-
TPHH17T309LF	9,80	16,98	3,97	0,94	3,33	-	-	-	2821319	-	-	-	-	-	-	-

TPGT-HP



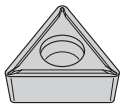


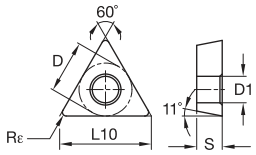
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPGT110202HP	6,35	11,00	2,38	0,20	2,90	-	-	-	2823605	-	-	-	-	-	-	-
TPGT110204HP	6,35	11,00	2,38	0,40	2,90	-	-	-	2823592	-	-	2823595	-	-	-	-
TPGT16T304HP	9,53	16,50	3,97	0,40	4,40	-	-	-	2821536	-	-	-	-	-	-	-

TPMT-LF



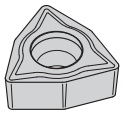


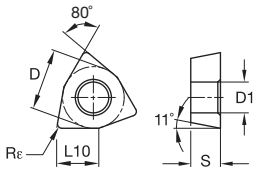
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPMT110202LF	6,35	11,00	2,38	0,20	2,80	-	-	-	2823646	-	-	-	-	-	-	-
TPMT110204LF	6,35	11,00	2,38	0,40	2,90	-	-	-	2823625	-	2823619	-	-	-	-	-
TPMT160304LF	9,53	16,50	3,18	0,40	4,40	-	-	-	2821577	-	2821571	-	-	-	-	-
TPMT160308LF	9,53	16,50	3,18	0,79	4,40	-	-	-	2821566	-	-	-	-	-	-	-

WPHT



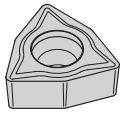


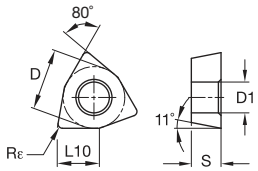
● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
WPHTS30101	4,76	3,26	1,59	0,10	2,16	-	-	-	2827496	-	-	-	-	-	-	-
WPHTS30102	4,76	3,26	1,59	0,20	2,16	-	-	-	2827483	-	-	2827490	-	-	-	-
WPHTS30104	4,76	3,26	1,59	0,40	2,16	-	-	-	2827471	-	-	2827477	-	-	-	-
WPGT040202UF	6,35	4,34	2,38	0,20	2,79	-	-	-	2824331	-	-	-	-	-	-	-
WPHT040201	6,35	4,34	2,38	0,10	2,80	-	-	-	2824344	-	-	-	-	-	-	-
WPHT040204	6,35	4,34	2,38	0,40	2,80	-	-	-	2824316	-	-	-	-	-	-	-

WPMT-LF



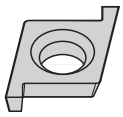


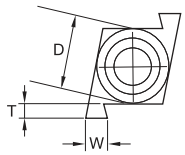
● first choice
○ alternate choice

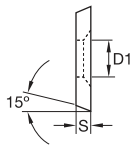
	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

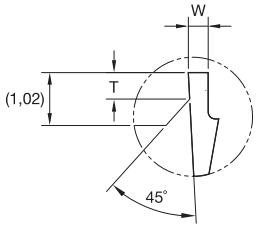
ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
WPMTS3T104LF	4,76	3,26	1,98	0,40	2,15	●	●	●	●	2827521	●	●	●	●	●	●
WPMT040204LF	6,35	4,34	2,38	0,40	2,90	●	●	●	●	2824362	●	●	●	●	●	●
WPMT06T304LF	9,53	6,52	3,97	0,40	4,40	●	●	●	●	2821036	●	●	●	●	●	●
WPMT06T308LF	9,53	6,52	3,97	0,80	4,40	●	●	●	●	2821023	●	●	●	●	●	●

CDG • R/L









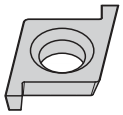
NOTE: Detail of 0,38 insert.

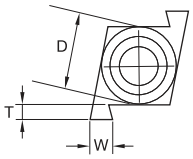
● first choice
○ alternate choice

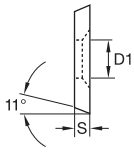
	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

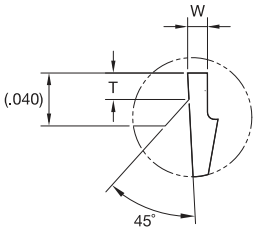
ISO catalogue number	D	S	T	W	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
CDG50252R	3,97	1,27	1,02	0,64	2,13	●	●	●	2830541	●	●	●	●	●	●	●
CDG50302R	3,97	1,27	1,02	0,76	2,13	●	●	●	2830529	●	●	●	●	●	●	●

CPG • R/L









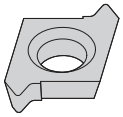
Detail of .015" (0,38mm) insert.

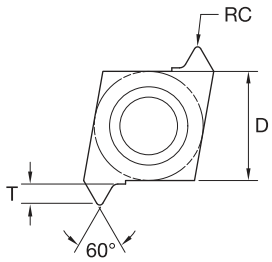
● first choice
○ alternate choice

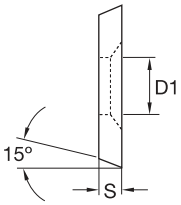
P					●	○	●	○	○	●		
M		○	○	○	●	●	○	○	○	○		
K		○	●	●	○	○	○	○	●	○		
N		●	●	●	●	○		○		○		●
S		○	○	○	●	○		●				
H											●	

ISO catalogue number	D	S	T	W	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
CPG2032R	6,35	1,91	1,65	0,76	2,79	●	●	●	2824546	●	●	●	●	●	●	●
CPG2062R	6,35	1,91	1,65	1,52	2,79	●	●	●	2824531	●	●	●	●	●	●	●

CDT • R/L





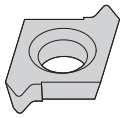


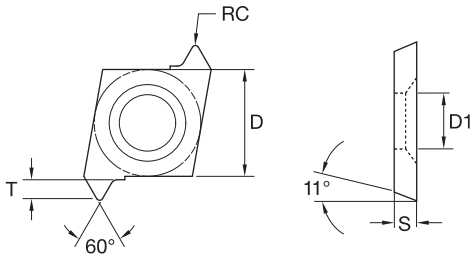
● first choice
○ alternate choice

P					●	○	●	○	○	●		
M		○	○	○	●	●	○	○	○	○		
K		○	●	●	○	○	○	○	●	○		
N		●	●	●	●	○		○		○		●
S		○	○	○	●	○		●				
H											●	

catalogue number	D	S	T	RC	D1	TP min	TP max	TPI min	TPI max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CDT50022R	3,97	1,27	0,76	0,05	2,11	0,5	1,0	24.0	48.0	●	●	●	2830567	●	●	●	●	●	●	●

CPT • R/L



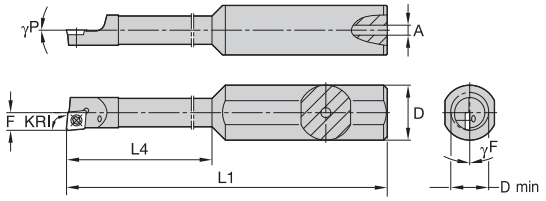


● first choice
○ alternate choice

	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
P				●	○	●	○	○	●		
M	○	○	○	●	●	○	○	○	○		
K	○	●	●	○	○	○	○	●	○		
N	●	●	●	●	○		○		○		●
S	○	○	○	●	○		●				
H										●	

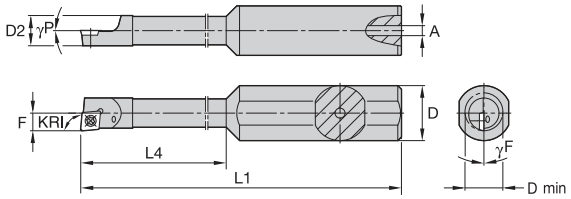
ISO catalogue number	D	S	T	RC	D1	TPI min	TPI max	TP min	TP max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																				
CPT20052R	6,35	1,91	1,65	0,13	2,79	10	24	1,0	2,5	-	-	-	2824516	-	-	2824523	-	-	-	-

CCBM • STEPPED



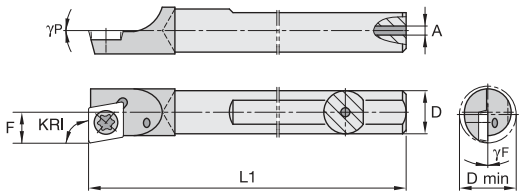
order number	catalogue number	KRI	D	D min	F	L1	L4	A	γF°	γP°	gage insert
right hand											
3896015	CCBM4816225R	95	16,00	5,28	2,64	85,72	22,23	3,18	0.0°	5.0°	CD..S4T002

CSBM • STEPPED



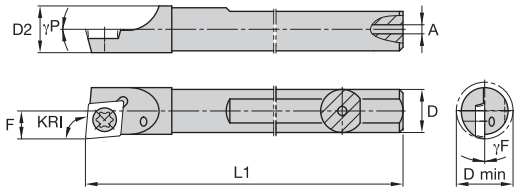
order number	catalogue number	KRI	D	D min	D2	F	L1	L4	A	γF°	γP°	gage insert
right hand												
2831606	CSBM5210250R	90	10,00	5,94	5,16	3,10	70,00	25,72	1,02	0.0°	5.0°	CD..S4T002
2831639	CSBM5210125R	95	10,00	5,78	5,16	2,95	70,00	12,30	1,02	0.0°	5.0°	CD..S4T002
2831468	CSBM6412325R	95	12,00	7,24	6,60	3,68	70,00	31,75	1,02	0.0°	5.0°	CD..S4T002

CCBM



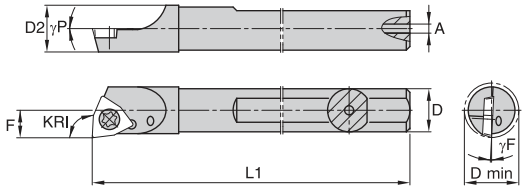
order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert
right hand										
2831801	CCBM51000R	90	5,00	5,94	3,18	100,58	1,02	0.0°	5.0°	CD..S4T002
3896025	CCBM61000R	90	6,00	7,08	3,73	100,33	1,19	0.0°	5.0°	CD..S4T002
2831277	CCBM81520R	90	8,00	9,04	4,70	152,15	2,36	0.0°	5.0°	CD..S4T002
2831826	CCBM51005R	95	5,00	5,94	3,02	100,58	1,02	0.0°	5.0°	CD..S4T002
2831311	CCBM61525R	95	6,00	7,08	3,73	152,15	1,19	0.0°	5.0°	CD..S4T002
2831821	CCBM61005R	95	6,00	7,09	3,73	100,33	1,19	0.0°	5.0°	CD..S4T002
2831289	CCBM81525R	95	8,00	9,04	4,70	152,40	2,36	0.0°	5.0°	CD..S4T002
2831832	CCBM41007R	97	3,96	4,57	2,41	100,33	1,02	0.0°	0.0°	CD..S4T002
2831324	CCBM41527R	97	4,00	4,57	2,41	152,00	1,02	0.0°	0.0°	CD..S4T002

CSBM



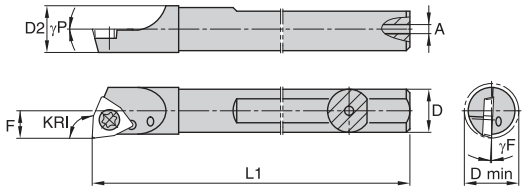
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert
right hand											
3896205	CSBM5650R	90	5,00	5,94	5,16	3,10	63,50	1,02	0.0°	5.0°	CD..S4T002
2831441	CSBM5655R	95	5,00	5,79	5,16	2,95	63,50	1,02	0.0°	5.0°	CD..S4T002
2831687	CSBM6655R	95	6,00	7,09	6,20	3,73	63,50	1,02	0.0°	5.0°	CD..S4T002
2831666	CSBM8765R	95	8,00	9,04	8,18	4,70	76,20	1,52	0.0°	5.0°	CD..S4T002
2831701	CSBM4657R	97	4,00	4,57	4,22	2,41	63,50	1,02	0.0°	0.0°	CD..S4T002
left hand											
2831695	CSBM4657L	97	4,00	4,57	4,22	2,41	63,50	1,02	0.0°	0.0°	CD..S4T002

QSBMW



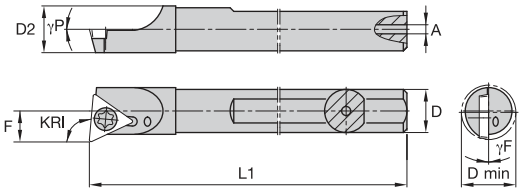
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert
right hand											
3393828	QSBMW121523R	93	12,00	12,90	12,19	6,55	152,40	4,00	-3.0°	0.0°	WP..040204

GSBMW



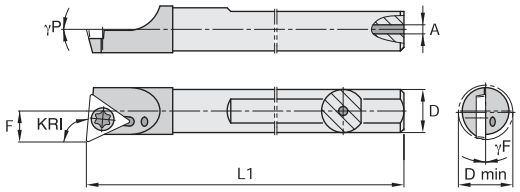
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert
right hand											
2828122	GSBMW61003R	93	6,00	6,78	6,21	3,43	101,60	1,02	-3.0°	0.0°	WP..S30104

QSBM



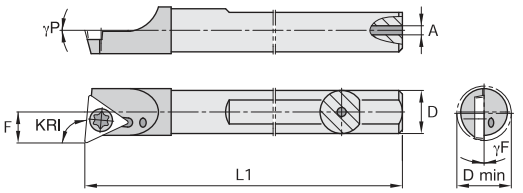
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert
right hand											
3886552	QSBM101275R	95	10,00	11,15	10,21	5,79	127,00	3,20	0.0°	5.0°	TP..110202

SDBM



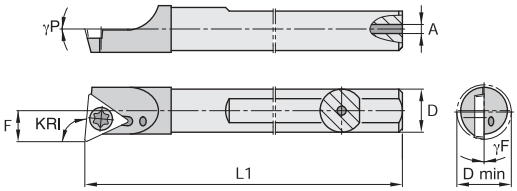
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert
right hand											
2822085	SDBM162545R	95	16,00	17,25	16,13	8,89	254,00	5,51	0.0°	5.0°	TP..160302

QCBM



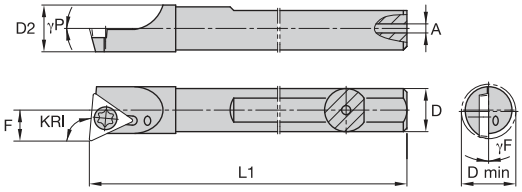
order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert
right hand										
2824747	QCBM122545R	95	12,00	13,16	6,81	254,00	4,70	0.0°	5.0°	TP..110202

FCBM



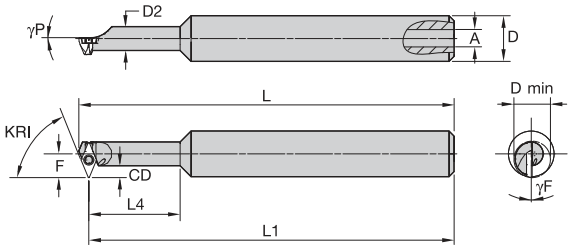
order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert
right hand										
3896031	FCBM61520R	90	6,00	7,06	3,70	152,40	1,19	0.0°	5.0°	TD..07S102
2829356	FCBM81520R	90	8,00	9,16	4,80	152,40	2,36	0.0°	5.0°	TD..07S102
2829390	FCBM61525R	95	6,00	7,06	3,71	152,40	1,19	0.0°	5.0°	TD..07S102

FSBM

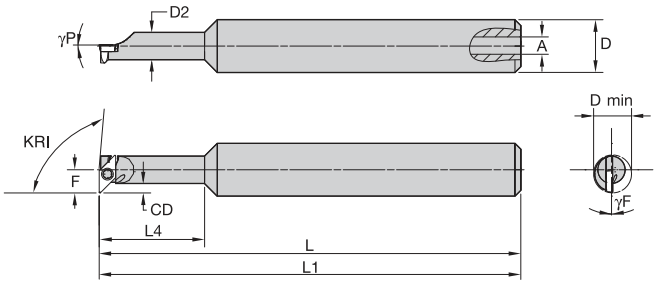


order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert
right hand											
2829566	FSBM61005R	95	6,00	7,06	6,20	3,71	101,60	1,02	0.0°	5.0°	TD..07S102

CSPM



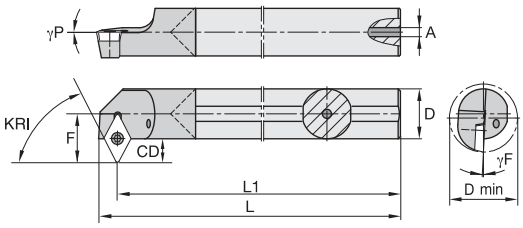
NOTE: KRI shown as 67,5°.



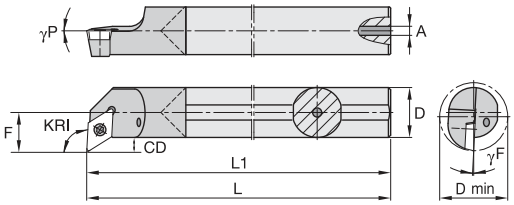
NOTE: KRI shown as 95°.

order number	catalogue number	KRI	D	D min	D2	F	CD	L	L1	L4	A	γF°	γP°	gage insert
right hand														
2831411	CSPM712255R	95.0	12,00	9,14	6,60	5,59	2,29	101,60	101,60	25,40	1,02	0.0°	0.0°	GC..050102
left hand														
2831394	CSPM71225225L	67.5	12,00	10,16	6,60	6,60	3,30	104,00	101,60	25,40	1,02	0.0°	0.0°	GPHW050102

CCPM



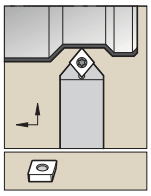
NOTE: KRI shown as 67,5°.



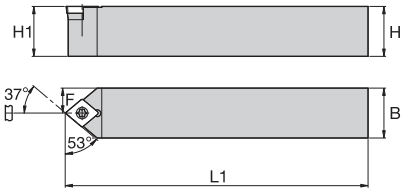
NOTE: KRI shown as 95°.

order number	catalogue number	KRI	D	D min	F	CD	L	L1	A	γF°	γP°	gage insert
right hand												
2831020	CCPM61525R	95.0	6,00	9,14	5,59	2,49	152,40	152,40	1,19	0.0°	0.0°	GP..050102
left hand												
3896022	CCPM81525L	95.0	8,00	10,74	6,38	2,28	152,40	152,40	2,23	0.0°	0.0°	GP..050102

LR Series 53° Toolholder

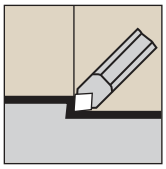


See pages E22-E27, E122, E158, E167-E168 for inserts.

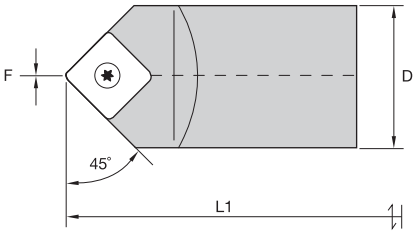


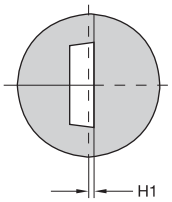
order number	catalogue number	B	F	H	H1	L1	gage insert
left hand							
2028218	**12157210300**	8,00	4,50	8,00	6,00	32,00	CC..0602..

LR Series 45° Boring Bar



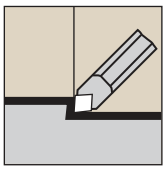
Steel shank without through coolant
See pages E64-E67 for inserts.



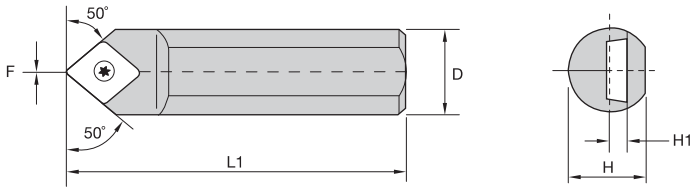


order number	catalogue number	D	F	H1	L1	gage insert
neutral hand						
2031213	**S30MSSDCN12**	30,00	0,00	0,50	150,00	SC..1204..

LR Series 50° Boring Bar

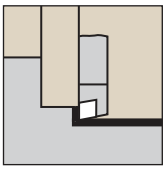


Steel shank without through coolant
See pages E22-E27, E122, E158, E167-E168 for inserts.

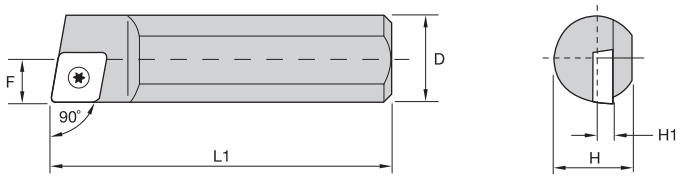


order number	catalogue number	D	F	H	H1	L1	gage insert
neutral hand							
2024091	**S08ASCMCN065**	8,00	0,00	7,00	6,00	32,00	CC..0602..
2012035	**S10BSCMCN06**	10,00	0,00	9,00	7,00	40,00	CC..0602..
2031113	**S12DSCMCN06**	12,00	0,00	11,00	8,00	60,00	CC..0602..
2030994	**12157301800**	16,00	0,00	15,00	10,00	80,00	CC..09T3..

LR Series 90° Boring Bar

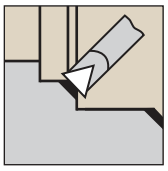


Steel shank without through coolant
See pages E22-E27, E122, E158, E167-E168 for inserts.

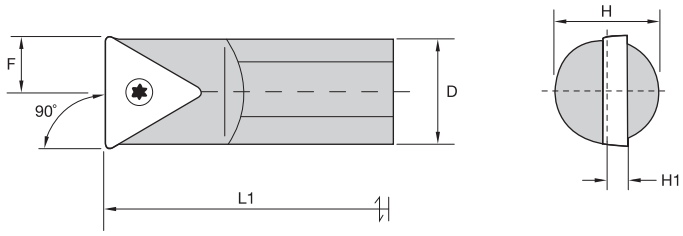


order number	catalogue number	D	F	H	H1	L1	gage insert
right hand							
2031103	**S10BSCACR06**	10,00	5,30	9,00	7,00	40,00	CC..0602..
left hand							
2031102	**S10BSCACL06**	10,00	5,30	9,00	7,00	40,00	CC..0602..

LR Series 90° Boring Bar • TC



Steel shank without through coolant
See pages E83-E85, E124, E163-E164, E175 for inserts.



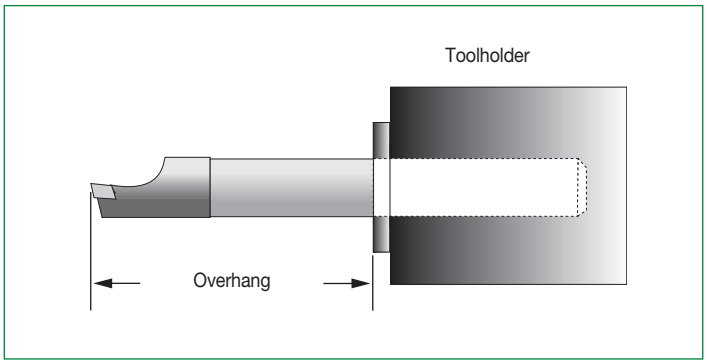
order number	catalogue number	D	F	H	H1	L1	gage insert
neutral hand							
2031104	**S10BSTCCN11**	10,00	5,20	9,00	2,00	40,00	TC..1102..

Setup Recommendations

Setup Recommendations for Bar Overhang

WIDIA-CIRCLE™ cutting tools are the finest quality boring, grooving, profiling, and threading tools available. For more than 50 years, WIDIA-CIRCLE has been the industry leader in solving small-diameter hole machining problems in major manufacturing plants worldwide.

A common problem associated with any cutting tool is extending the tool beyond its support point. This condition of excessive overhang can cause chatter, poor finishes, or inadequate tool life.



We recommend a 4:1 ratio (4 times bar diameter) overhang when using steel shank bars and up to a 10:1 (10 times bar diameter) overhang when using carbide shank bars. The overhang ratios are affected by many factors:

- Type(s) of material(s) being machined.
- Depth of cut(s).
- Feed rate(s).

Recommended conditions may still be unsatisfactory because of chatter. Chatter can be induced by non-rigid setups or harmonics from the machine or machining conditions. In many cases, changing the RPM of the machine can reduce chatter.

shank diameter (mm)	steel shank ratio 4:1 (mm)	carbide shank ratio 10:1 (mm)
4,00mm	16,00mm	40,00mm
5,00mm	20,00mm	50,00mm
6,00mm	24,00mm	60,00mm
8,00mm	32,00mm	80,00mm
10,00mm	40,00mm	100,00mm
12,00mm	48,00mm	120,00mm
16,00mm	64,00mm	160,00mm
20,00mm	80,00mm	200,00mm
25,00mm	100,00mm	250,00mm
32,00mm	128,00mm	320,00mm

WGC™

Grooving and Cut-Off

The most versatile tool in the market for grooving, profiling, and cut-off operations.

4 BENEFITS IN 1

VERSATILITY

Single-sided versatile grooving, cut-off, and profiling solution for all materials.

STABILITY

Secure seating and clamping for reliability in demanding groove-turn applications.

PRODUCTIVITY

Higher speeds and feeds due to better chip evacuation and low cutting forces. Optimized chip breaker design and through coolant capability.

SIMPLICITY

Easy to select and apply for all grooving, cut-off, and profiling applications.

GROOVING

PRECISION MOLDED AND GROUND

P M N S

PT-Positive Rake

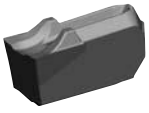
PRECISION MOLDED

P M K H

PN-Negative Rake

CUT-OFF

PRECISION MOLDED AND GROUND



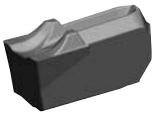
P M N S

F-Fine

PRECISION MOLDED

P K

M-Medium



P M

R-Rough

Profiling

PRECISION GROUND

P M N S

PC-Full Radius

NOTE: Use the NOVO™ software to select appropriate tooholder and insert.

WIDIA™ GROOVING AND CUT-OFF

INSERTS

APPLICATION	TYPES	GROOVE WIDTH	INSERT GEOMETRY	MATERIALS
GROOVING		2,00–10,13mm (0.084–0.399")	PT-Positive Rake	P M K N S
			PN-Negative Rake	P M K S
CUT-OFF		1,4–8,0mm (0.055–0.315")	F-Fine	P M K N S
			M-Medium	P M K S
			R-Rough	P M K S
PROFILING		2,0–8,0mm (0.079–0.315")	PC-Full Radius	P M K N S

APPLICATIONS

TURNING

PROFILING

FACING

CHAMFERING

GROOVING

CUT-OFF

DEEP GROOVING

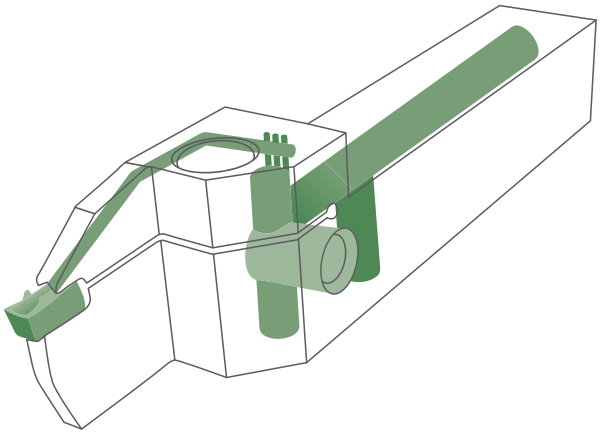
THROUGH COOLANT

INDUSTRY

ENERGY

GENERAL ENGINEERING

TRANSPORTATION

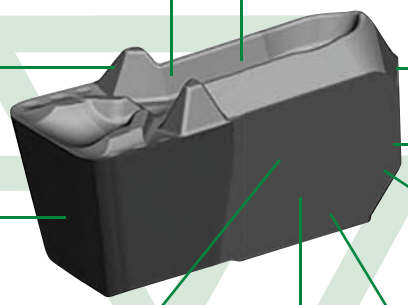


Grooving and Cut-Off • WGC

Proprietary negative chip geometry
Added chip control in steel, cast, stainless, and hardened materials.

Coolant channel on rake and pocket
Efficient coolant delivery for longer tool life and higher metal removal rates.

Single-ended design
Deeper grooving capability than typical double-ended systems.



Protective horns
Eliminate chip jamming and protect steel for reduced downtime and wear.

Proprietary V-back seating design
Provides high side-load stability comparable to longer double-ended inserts.

Positive back stop
Enables easy indexing.

Wide range of insert offering
1,4–10mm. PVD grades.

Strong V-style clamping
High stability for grooving, cut-off, side turning, deep grooving, face grooving, and profiling applications.

Enhanced body edge design
Improved seating stability.

Angle between top and bottom V
Creates a pull-in effect, securing the insert tighter in the pocket.

Industry-leading grade technologies
Proven performance in all materials.

Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product.
Use the following key columns and corresponding images to easily identify which attributes apply.

W	G	0312	M	03	U	02	PT
Family Name	Insert Type	Groove Width	Unit	Seat Size	Tolerance	Corner Radius	Chipbreaker/ Edge Condition
WGC	**G** = Square **R** = Full Radius	**Metric** = 1/100mm **Inch** = 1/1000"	**M** = Metric **I** = Inch		**U** = Precision Molded **P** = Precision Ground		**PT** = Groove-Turn Universal Positive **PN** = Groove-Turn Universal Negative

seat size (SSC)	groove width mm	groove width inch
1B	1,40	.055
1F	1,60–1,99	.063–.078
02	2,00–2,99	.079–.117
03	3,00–3,99	.118–.156
04	4,00–4,99	.157–.196
05	5,00–5,99	.197–.235
06	6,00–7,99	.236–.314
08	8,00–8,99	.315–.353
10	9,00–10,12	.354–.398

**.312" = seat size 08*

mm	
00	full radius
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2

inch	
00	full radius
05	.008
1	.016
2	.032
3	.047

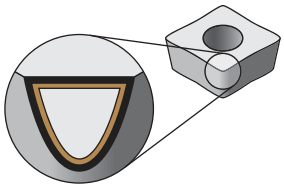
W	C	030	M	03	N	00	F	02
Family Name	Insert Type	Cutting Edge Width	Unit	Seat Size	Hand of Insert	Approach Angle	Chipbreaker	Corner Radius
WGC	**C** = Cut-Off		**M** = Metric **I** = Inch		**N** = Neutral **L** = Left hand **R** = Right hand	**00** = Neutral **06** = 6°	**F** = Cut-Off Low Feed **M** = Cut-Off Fine **R** = Cut-Off Rough	

	mm	inch
014	1,4	.055
020	2,0	.079
030	3,0	.118
040	4,0	.157
050	5,0	.197
060	6,0	.236
070	7,0	.279
080	8,0	.315

	mm	inch
1B	1,4	.055
1F	2,0	.079
02	3,0	.118
03	4,0	.157
04	5,0	.197
05	6,0	.236
06	7,0	.279
08	8,0	.315

	mm	inch
01	0,1	.004
02	0,2	.008
04	0,4	.016

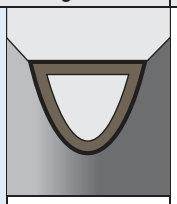
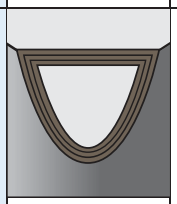
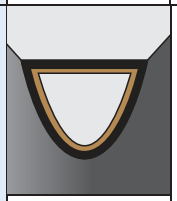
Grades and Grade Descriptions



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

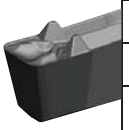
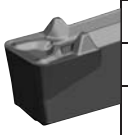
wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
WU10PT	 –	**Composition:** An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. **Application:** The WU10PT™ grade is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys with improved edge toughness and higher cutting speed/feed capability.	P									
			M									
			K									
			N									
			S									
			H									
WU25PT	 –	**Composition:** An advanced PVD-TiAlN-coated grade with a tough, ultra-fine grain, unalloyed substrate. **Application:** For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P									
			M									
			K									
			N									
			S									
			H									
WU35PT	 –	**Composition:** A multilayer PVD-coated carbide grade with an advanced AlTiN-TiN coating over a super-tough substrate. **Application:** WU35PT is an excellent grade for machining stainless steels, all types of steels, super alloys in turning, and cut-off applications. The substrate provides improved toughness while the coating layers offer excellent abrasion resistance and dependability at a wide range of speeds and feeds. Improved edge toughness provides security in interrupted cuts.	P									
			M									
			S									

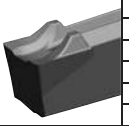
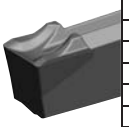
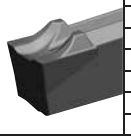
Plunge Feed Rates

● first choice
○ alternate choice

P	Steel	K	Cast Iron	S	High-Temp Alloys
M	Stainless Steel	N	Non-Ferrous	H	Hardened Materials

Chip Control	Description	Insert Geometry	Seat Size (SSC)	Corner Radius mm	Starting Conditions mm	Plunge Feed Rates mm/rev 0,05 0,10 0,15 0,20 0,25 0,30 0,35
-PT	Positive rake angle for lower cutting forces.		1F	0,2	0,06	
			2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,15	
				0,8	0,18	
				1,2	0,20	
			8	0,8	0,20	
				1,2	0,22	
			10	1,2	0,24	
-PN	Stable negative cutting edge allowing for more aggressive applications.		1F	0,2	0,06	
			2	0,2	0,08	
			3	0,2	0,09	
				0,4	0,11	
			4	0,4	0,12	
				0,8	0,15	
			5	0,4	0,15	
				0,8	0,16	
			6	0,4	0,15	
				0,8	0,18	
				1,2	0,20	
			8	0,8	0,20	
				1,2	0,22	
			10	1,2	0,24	

Cut-Off Feed Rates

Geometry	Description	Insert Geometry	Seat Size (SSC)	Starting Conditions mm	Cut-Off Feed Rates mm/rev 0,05 0,10 0,15 0,20 0,25 0,30 0,35 0,40
-F	Positive geometry for reduced cutting forces.		1B	0,06	
			2	0,07	
			3	0,09	
			4	0,11	
			5	0,13	
-M	Stable cutting edge for aggressive feed rates. Primarily in cast iron.		1B	0,06	
			2	0,07	
			3	0,09	
			4	0,11	
			5	0,14	
			6	0,16	
			8	0,14	
-R	Most stable cutting edge for steel.		2	0,10	
			3	0,14	
			4	0,16	
			5	0,19	
			6	0,21	
			8	0,23	

NOTE: For cut-off inserts with a lead angle, maximum feed rate should be reduced by up to 40%.

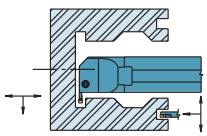
Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	0.8
N	1.2
S	0.8
H	0.5

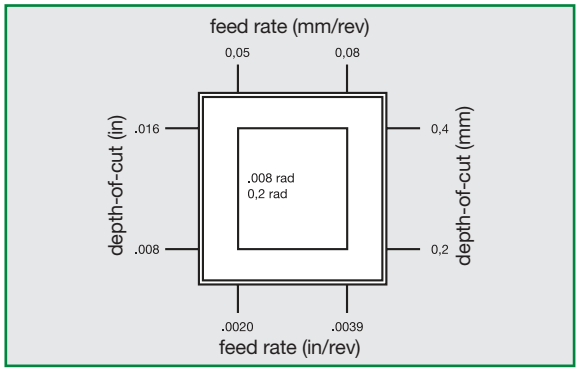
I.D. and Face Grooving

For I.D. and face grooving applications, reduce feed rate by 20%.

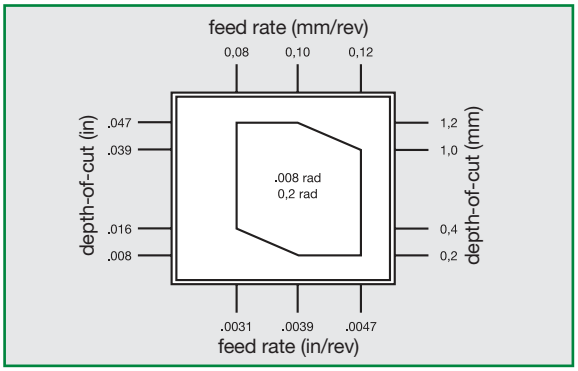


Turn and Profile Feed Rates

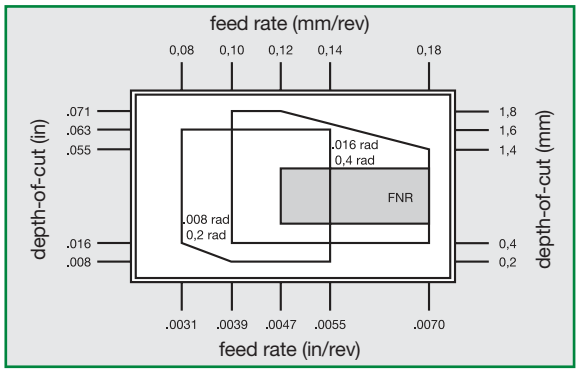
Seat Size 1F



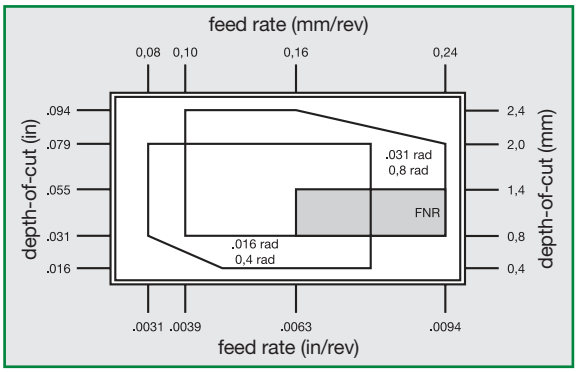
Seat Size 2



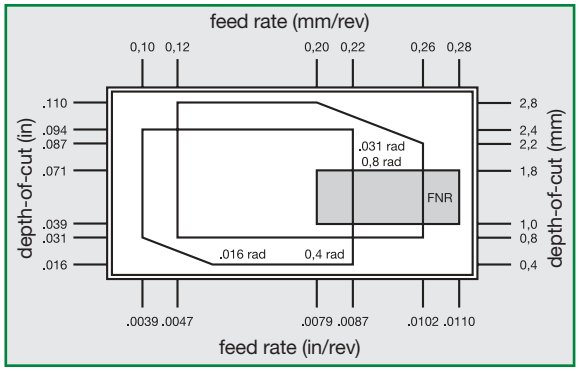
Seat Size 3



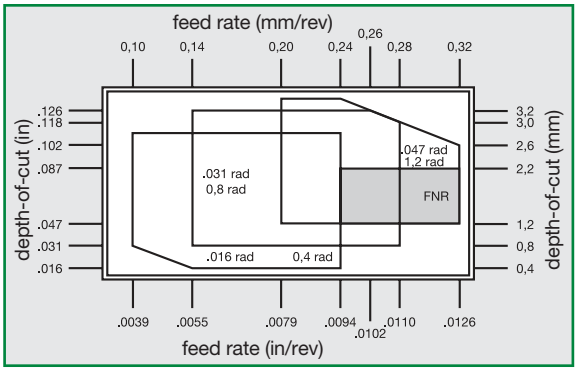
Seat Size 4



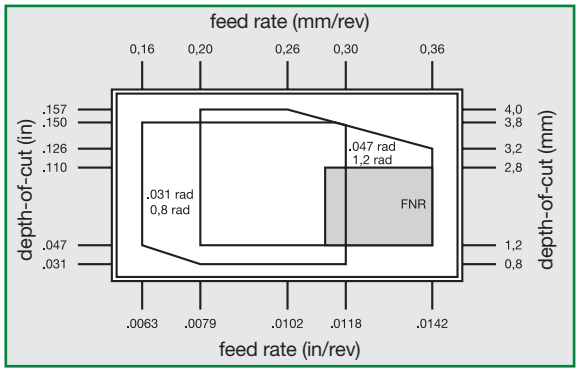
Seat Size 5



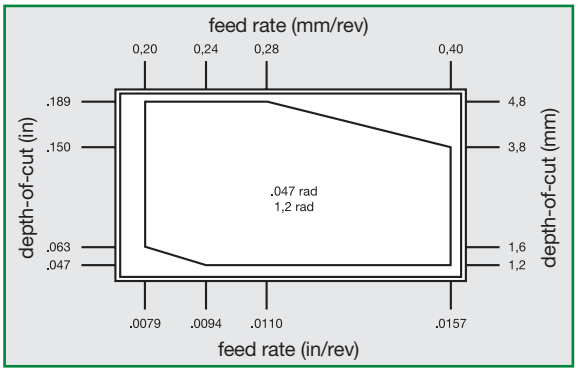
Seat Size 6



Seat Size 8



Seat Size 10



** FNR = Full Nose Radius*

Recommended Starting Speeds • Metric

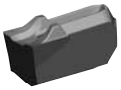
Material Group		WU25PT			WU10PT			WU35PT		
P	0–1	110	**225**	270	140	**280**	350	90	**180**	213
	2	110	**160**	260	140	**200**	300	90	**130**	155
	3	110	**125**	235	140	**155**	245	90	**100**	155
	4	60	**90**	160	75	**110**	170	50	**70**	110
	5	100	**160**	210	120	**200**	260	80	**130**	165
	6	85	**120**	185	110	**150**	230	70	**100**	145
M	1	90	**170**	245	140	**210**	280	75	**120**	135
	2	90	**150**	245	120	**200**	245	75	**110**	135
	3	90	**140**	210	120	**180**	245	75	**90**	135
K	1	100	**145**	225	120	**180**	245	–	**–**	–
	2	70	**120**	170	90	**150**	240	–	**–**	–
	3	50	**85**	120	60	**110**	150	–	**–**	–
N	1–2	120	**440**	780	150	**550**	975	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	100	**290**	490	120	**365**	700	–	**–**	–
	5	70	**135**	195	90	**170**	245	–	**–**	–
	6	100	**170**	245	120	**210**	305	–	**–**	–
S	1	8	**40**	60	15	**55**	135	8	**35**	60
	2	8	**30**	75	15	**60**	135	8	**30**	60
	3	15	**40**	75	15	**70**	150	15	**35**	60
	4	8	**50**	110	15	**70**	170	15	**45**	90
H	1	–	**–**	–	30	**45**	60	–	**–**	–
	2	–	**–**	–	15	**30**	45	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–

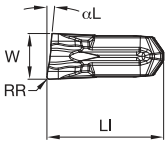
*NOTE: First choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

WGC Cut-Off Inserts • F Precision Molded • Metric

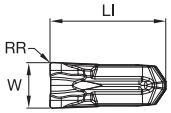
Left Hand

Neutral

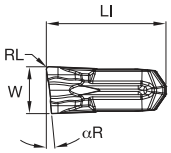

Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC014M1BL06F01	1B	1,40	0,050	9,00	–	6	0,15	–	'	6470544	'
WC014M1BN00F01	1B	1,40	0,050	9,00	–	–	0,15	0,15	'	6470545	'
WC014M1BR06F01	1B	1,40	0,050	9,02	6	–	–	0,15	'	6470546	'
WC020M02L06F02	2	2,00	0,050	9,00	–	6	0,20	–	'	6470547	'
WC020M02N00F02	2	2,00	0,050	9,00	–	–	0,20	0,20	'	6470548	'
WC020M02R06F02	2	2,00	0,050	9,00	6	–	–	0,20	'	6470549	'
WC030M03L06F02	3	3,00	0,075	9,60	–	6	0,20	–	'	6470550	'
WC030M03N00F02	3	3,00	0,075	9,63	–	–	0,20	0,20	'	6470561	'
WC030M03R06F02	3	3,00	0,075	9,60	6	–	–	–	'	6470562	'
WC040M04L06F02	4	4,00	0,075	10,19	–	6	0,20	–	'	6470563	'
WC040M04N00F02	4	4,00	0,075	10,19	–	–	0,20	0,20	'	6470564	'
WC040M04R06F02	4	4,00	0,075	10,19	6	–	–	0,20	'	6470565	'
WC050M05N00F03	5	5,00	0,075	12,24	–	–	0,30	0,30	'	6470566	'

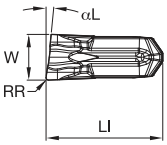
NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Cut-Off Inserts • F Precision Ground • Inch

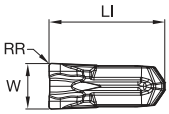
Left Hand

Neutral

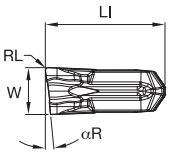
Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC014M1BPR06F00	1B	1,40	0,025	9,00	6	–	–	–	-	6686392	-
WC014M1BPR12F00	1B	1,40	0,025	9,00	12	–	–	–	-	6686394	-
WC094I02PL06F00	2	2,39	0,025	8,95	–	6	–	–	-	6686395	-
WC094I02PL12F00	2	2,39	0,025	8,95	–	12	–	–	-	6686396	-
WC094I02PN00F00	2	2,39	0,025	8,95	–	–	–	–	-	6686398	-
WC094I02PR06F00	2	2,39	0,025	8,95	6	–	–	–	-	6686411	-
WC094I02PR12F00	2	2,39	0,025	8,95	–	12	–	–	-	6686413	-
WC094I02PL06F0	2	2,39	0,025	9,04	–	6	0,10	0,10	-	-	6686474
WC094I02PN00F0	2	2,39	0,025	9,04	–	–	0,10	0,10	-	6686397	6686475
WC094I02PN00F05	2	2,39	0,025	9,04	–	–	0,20	0,20	6686067	6686399	-
WC094I02PR06F0	2	2,39	0,025	9,04	6	–	0,10	0,10	-	6686400	6686477
WC094I02PR06F05	2	2,39	0,025	9,04	6	–	0,20	0,20	6686082	6686412	-

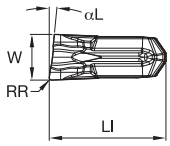
WGC Cut-Off Inserts • F Precision Ground • Inch

(continued)

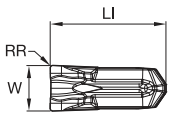
Left Hand

Neutral

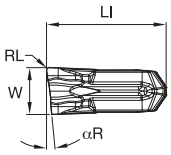
Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC025M02PR06F01	2	2,50	0,025	9,04	6	–	0,15	0,15	-	-	6686472
WC030M03PN00F02	3	3,00	0,075	9,63	–	–	0,20	0,20	-	-	6686473
WC125I03PL06F00	3	3,18	0,025	9,48	–	6	–	–	-	6686414	-
WC125I03PL12F00	3	3,18	0,025	9,48	–	12	–	–	-	6686416	-
WC125I03PN00F00	3	3,18	0,025	9,48	–	–	–	–	6686086	6686418	-
WC125I03PR06F00	3	3,18	0,025	9,48	6	–	–	–	6686089	6686421	-
WC125I03PL06F0	3	3,18	0,025	9,63	–	6	0,10	0,10	-	-	6686478
WC125I03PL06F05	3	3,18	0,025	9,63	–	6	0,20	0,20	-	6686415	-
WC125I03PN00F0	3	3,18	0,025	9,63	–	–	0,10	0,10	6686083	6686417	6686479
WC125I03PN00F05	3	3,18	0,025	9,63	–	–	0,20	0,20	6686087	6686419	-
WC125I03PR06F0	3	3,18	0,025	9,63	6	–	0,10	0,10	6686088	6686420	6686480
WC125I03PR06F05	3	3,18	0,025	9,63	6	–	0,20	0,20	6686090	6686422	-

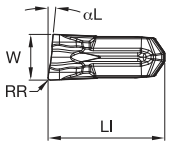
WGC Cut-Off Inserts • F Precision Ground • Inch

(continued)

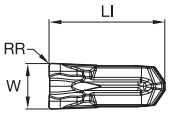
Left Hand

Neutral

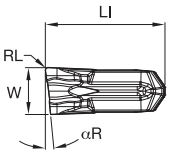
Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC125I03PR12F00	3	3,18	0,025	9,75	12	–	–	–	-	6686423	-
WC040M04PR06F00	4	4,00	0,025	10,01	6	–	–	–	-	6686430	-
WC040M04PR12F00	4	4,00	0,025	10,01	12	–	–	–	-	6686431	-
WC188I04PR12F00	4	4,75	0,025	10,01	12	–	–	–	-	6686429	-
WC188I04PR06F00	4	4,76	0,025	10,01	6	–	–	–	6686102	6686427	-
WC188I04PL06F00	4	4,76	0,025	10,02	–	6	–	–	-	6686424	-
WC188I04PN00F00	4	4,76	0,025	10,02	–	–	–	–	-	6686425	-
WC188I04PN00F05	4	4,76	0,025	10,16	–	–	0,20	0,20	6686101	6686426	-
WC188I04PR06F05	4	4,76	0,025	10,17	6	–	0,20	0,20	-	6686428	-

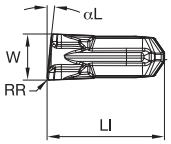
NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Cut-Off Inserts • M Precision Molded • Metric

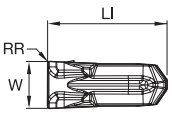
Left Hand

Neutral

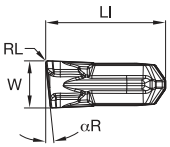
Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC014M1BL06M02	1B	1,40	0,050	9,02	–	6	–	0,20	'	6461828	'
WC014M1BN00M01	1B	1,40	0,050	9,01	–	–	0,15	0,15	'	6461829	'
WC014M1BR06M02	1B	1,40	0,050	9,02	6	–	–	0,20	'	6461830	'
WC020M02L06M02	2	2,00	0,050	8,97	–	6	–	0,20	'	6461861	'
WC020M02N00M02	2	2,00	0,050	8,98	–	–	0,20	0,20	'	6461862	'
WC020M02R06M02	2	2,00	0,050	9,00	6	–	–	0,20	'	6461863	'
WC030M03L06M02	3	3,00	0,075	9,61	–	6	–	0,20	'	6461864	'
WC030M03N00M02	3	3,00	0,075	9,60	–	–	0,20	0,20	'	6461865	'
WC030M03R06M02	3	3,00	0,075	9,61	6	–	–	0,20	'	6461866	'
WC040M04L06M02	4	4,00	0,075	10,19	–	6	0,20	–	'	6461867	'
WC040M04N00M02	4	4,00	0,075	10,20	–	–	0,20	0,20	'	6461868	'
WC040M04R06M02	4	4,00	0,050	10,20	6	–	–	0,20	'	6461869	'

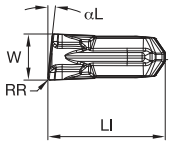
WGC Cut-Off Inserts • M Precision Molded • Metric

(continued)

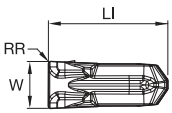
Left Hand

Neutral

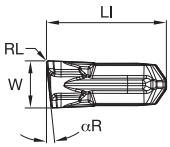
Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC050M05N00M03	5	5,00	0,075	12,25	–	–	0,30	0,30	-	6461870	-
WC060M06N00M03	6	6,00	0,075	14,59	–	–	0,30	0,30	-	6461881	-
WC080M08N00M04	8	8,00	0,075	17,46	–	–	0,40	0,40	-	6461882	-

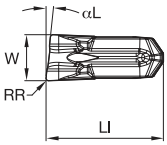
NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Cut-Off Inserts • R Precision Molded • Metric

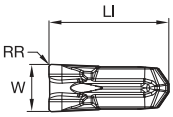
Left Hand

Neutral

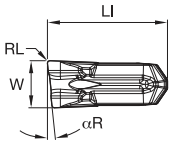
Right Hand



Left Hand



Neutral



Right Hand

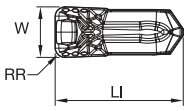
● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU10PT	WU25PT	WU35PT
WC020M02L06R02	2	2,00	0,050	8,97	–	6	0,20	–	'	6470426	'
WC020M02N00R02	2	2,00	0,050	8,98	–	–	0,20	0,20	'	6470427	'
WC020M02R06R02	2	2,00	0,050	8,97	6	–	–	0,20	'	6470428	'
WC030M03L06R02	3	3,00	0,075	9,61	–	6	0,20	–	'	6470429	'
WC030M03N00R02	3	3,00	0,075	9,60	–	–	0,20	0,20	'	6470430	'
WC030M03R06R02	3	3,00	0,075	9,61	6	–	–	0,20	'	6470461	'
WC040M04N00R02	4	4,00	0,075	10,20	–	–	0,20	0,20	'	6470462	'
WC050M05N00R03	5	5,00	0,075	12,25	–	–	0,30	0,30	'	6470463	'
WC060M06N00R03	6	6,00	0,075	14,59	–	–	0,30	0,30	'	6470464	'
WC080M08N00R04	8	8,00	0,075	17,46	–	–	0,40	0,40	'	6470465	'

NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PT Precision Molded • Metric



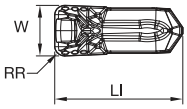
● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG0212M02U02PT	2	2,13	0,050	0,20	8,97	-	6461734	-
WG0251M02U02PT	2	2,51	0,050	0,20	8,97	-	6461735	-
WG0312M03U02PT	3	3,13	0,075	0,20	9,60	-	6461736	-
WG0312M03U04PT	3	3,13	0,075	0,40	9,60	-	6461737	-
WG0412M04U04PT	4	4,13	0,075	0,40	10,19	-	6461738	-
WG0412M04U08PT	4	4,13	0,075	0,80	10,19	-	6461739	-
WG0512M05U04PT	5	5,13	0,075	0,40	12,25	-	6461740	-
WG0512M05U08PT	5	5,13	0,075	0,80	12,25	-	6461821	-
WG0612M06U04PT	6	6,13	0,075	0,40	14,59	-	6461822	-
WG0612M06U08PT	6	6,13	0,075	0,80	14,59	-	6461823	-
WG0712M06U08PT	6	7,13	0,075	0,80	14,59	-	6461824	-
WG0812M08U08PT	8	8,13	0,075	0,80	17,45	-	6461825	-
WG0812M08U12PT	8	8,13	0,075	1,20	17,45	-	6461826	-
WG1012M10U12PT	10	10,13	0,075	1,20	20,75	-	6461827	-

NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PT Precision Molded • Inch



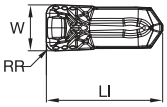
● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG130I03U1PT	3	3,30	0,075	0,40	9,60	-	6470487	-
WG130I03U05PT	3	3,30	0,075	0,20	9,60	-	6470486	-
WG192I04U1PT	4	4,88	0,075	0,40	10,19	-	6470488	-
WG192I04U2PT	4	4,88	0,075	0,78	10,19	-	6470489	-
WG255I06U1PT	6	6,48	0,075	0,40	14,58	-	6470490	-
WG255I06U2PT	6	6,48	0,075	0,80	14,58	-	6470541	-
WG317I08U3PT	8	8,05	0,075	1,19	17,46	-	6470542	-
WG380I10U3PT	10	9,65	0,075	1,19	20,75	-	6470543	-

NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PT Precision Ground • Metric



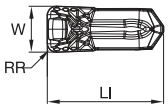
● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG0200M02P02PT	2	2,00	0,025	0,20	8,92	-	6741598	-
WG0300M03P02PT	3	3,00	0,025	0,20	9,55	-	6741599	-
WG0300M03P04PT	3	3,00	0,025	0,40	9,55	-	6741600	-
WG0400M04P04PT	4	4,00	0,025	0,40	10,15	-	6741611	-
WG0400M04P08PT	4	4,00	0,025	0,80	10,15	-	6741612	-
WG0500M05P04PT	5	5,00	0,025	0,40	12,18	-	6741613	-
WG0500M05P08PT	5	5,00	0,025	0,08	12,20	-	6741614	-
WG0600M06P04PT	6	6,00	0,025	0,40	14,53	-	6741615	-
WG0600M06P08PT	6	6,00	0,025	0,80	14,54	-	6741616	-

NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PT Precision Ground • Inch



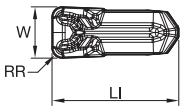
● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG125I03P05PT	3	3,18	0,075	0,20	9,55	-	6686432	-
WG188I04P08PT	4	4,76	0,025	0,32	10,14	-	6686433	-
WG250I06P08PT	6	6,35	0,075	0,32	14,53	-	6686434	-

NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PN Precision Molded • Metric



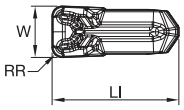
● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG0212M02U02PN	2	2,13	0,050	0,20	8,97	-	6470850	-
WG0251M02U02PN	2	2,51	0,050	0,20	8,97	-	6471041	-
WG0312M03U02PN	3	3,13	0,075	0,20	9,60	-	6471042	-
WG0312M03U04PN	3	3,13	0,075	0,40	9,60	-	6471043	-
WG0412M04U04PN	4	4,13	0,075	0,40	10,20	-	6471044	-
WG0412M04U08PN	4	4,13	0,075	0,80	10,20	-	6471045	-
WG0512M05U04PN	5	5,13	0,075	0,40	12,24	-	6471046	-
WG0512M05U08PN	5	5,13	0,075	0,80	12,24	-	6471047	-
WG0612M06U04PN	6	6,13	0,075	0,40	14,59	-	6471048	-
WG0612M06U08PN	6	6,13	0,075	0,80	14,59	-	6471049	-
WG0812M08U08PN	8	8,13	0,075	0,80	17,46	-	6471050	-
WG0812M08U12PN	8	8,13	0,075	1,20	17,46	-	6471062	-
WG1012M10U12PN	10	10,13	0,075	1,20	20,75	-	6471064	-

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PN Precision Molded • Inch



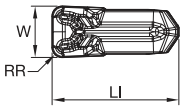
● first choice
○ alternate choice

P		○	●	●
M		●	●	●
K		○	○	
N		●	○	
S		●	●	●
H		○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG125I03U1PN	3	3,18	0,075	0,40	9,60	-	6470834	-
WG125I03U05PN	3	3,18	0,075	0,20	9,60	-	6470833	-
WG130I03U1PN	3	3,30	0,075	0,40	9,60	-	6470836	-
WG130I03U05PN	3	3,30	0,075	0,20	9,60	-	6470835	-
WG187I04U1PN	4	4,75	0,075	0,40	10,19	-	6470837	-
WG187I04U2PN	4	4,75	0,075	0,80	10,20	-	6470838	-
WG192I04U1PN	4	4,88	0,075	0,40	10,20	-	6470839	-
WG192I04U2PN	4	4,88	0,075	0,80	10,20	-	6470840	-
WG250I06U1PN	6	6,35	0,075	0,40	14,58	-	6470841	-
WG250I06U2PN	6	6,35	0,075	0,80	14,58	-	6470842	-
WG255I06U1PN	6	6,48	0,075	0,40	14,58	-	6470843	-
WG255I06U2PN	6	6,48	0,075	0,80	14,58	-	6470844	-

WGC Grooving Inserts • PN Precision Molded • Inch

(continued)



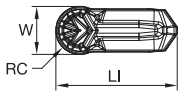
● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RR	LI	WU10PT	WU25PT	WU35PT
WG312I08U3PN	8	7,93	0,075	1,20	17,46	-	6470845	-
WG317I08U3PN	8	8,05	0,075	1,19	17,46	-	6470846	-
WG375I10U3PN	10	9,53	0,075	1,20	20,75	-	6470847	-
WG380I10U3PN	10	9,65	0,075	1,20	20,70	-	6470848	-

NOTE: SSC = To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PC Full Radius Precision Ground • Metric



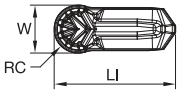
● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RC	LI	WU10PT	WU25PT	WU35PT
WR0200M02P00PC	2	2,00	0,025	1,00	8,91	'	6470467	'
WR0300M03P00PC	3	3,00	0,025	1,50	9,54	'	6470468	'
WR0400M04P00PC	4	4,00	0,025	2,00	10,13	'	6470469	'
WR0500M05P00PC	5	5,00	0,025	2,50	12,18	'	6470470	'
WR0600M06P00PC	6	6,00	0,025	3,00	14,52	'	6470481	'
WR0800M08P00PC	8	8,00	0,025	4,00	17,41	'	6470482	'

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

WGC Grooving Inserts • PC Full Radius Precision Ground • Inch



● first choice
○ alternate choice

P	○	●	●
M	●	●	●
K	○	○	
N	●	○	
S	●	●	●
H	○		

catalogue number	SSC	W	W tol ±	RC	LI	WU10PT	WU25PT	WU35PT
WR125I03P00PC	3	3,18	0,025	1,59	9,54	-	6470263	-
WR187I04P00PC	4	4,76	0,025	2,38	10,13	-	6470264	-
WR250I06P00PC	6	6,35	0,025	3,18	14,54	-	6470265	-
WR312I08P00PC	8	7,92	0,025	3,96	17,40	-	6470266	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Catalog Numbering System • Grooving

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

WGC	S	M	L	1616	K	02	08	C
Family Name	Tool Style	Support Type	Hand	Shank Size	Tool Length	Seat Size	Max Groove Depth	Coolant
WIDIA™ Grooving and Cut-Off	**S** = Straight mount	**M** = Maximum support for specific groove width and straight clearance for unlimited workpiece diameter **A** = Face grooving — inboard sweep **B** = Face grooving — outboard sweep	**L =** Left hand **R =** Right hand	**Metric** = Height x Width in mm letter indicates tool length according to ISO	**K** = 125 **M** = 150	**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	in millimeters	**C** = Through the pocket coolant capable

Catalog Numbering System • Cut-Off Blades

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

A	16	M	WGC	E	M	R	03	07	M
Steel Bar with Coolant	Bar Diameter	Bar Length	Platform	Tool Type	Support Type	Hand of Tool	Insert Seat Size	Max Cutting Depth	Tool Units
Steel boring bar with through coolant capability.	**Metric** = Diameter in mm **Inch** = Diameter in 1/16" increments		WIDIA™ Grooving and Cut-Off	**E** = End mount (90°)	**M** = Maximum support	**L** = Left hand **R** = RIght hand	**1F** **02** **03** **04** **05** **06** **08** **10**	in millimeters	**M** = Metric **I** = Inch

symbol	mm	inch
K	125	5
M	150	6
Q	180	7
R	200	8
S	250	10
T	300	12

Catalog Numbering System • Modular Toolholders

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

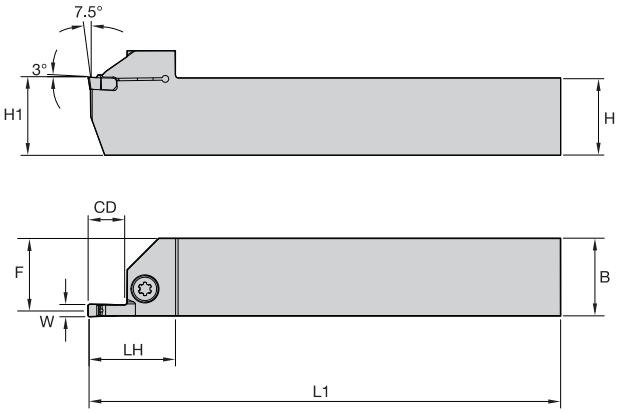
WGC	M	S	L	2525M	50	C
Family Name	Modular	Tool Style	Hand	Shank Size	Blade Size	Coolant
WIDIA™ Grooving and Cut-Off		**S** = Straight Mount **E** = End Mount (90°)	**L** = Left hand **R** = Right hand	**Metric** = Height x Width in mm letter indicates tool length accodring to ISO	**50** **65**	**C** = Through coolant capable

Catalog Numbering System • Modular Toolholders

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

WGC	M	50	L	03	14	M	C
Family Name	Modular	Blade Size	Hand	Seat Size	Max Groove Depth	Support Type	Coolant
WIDIA™ Grooving and Cut-Off		**50** **65**	**L** = Left hand **R** = Right hand	**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	in millimeters	**M** = Maximum support for specific groove width and straight clearance for unlimited diameter	**C** = Through the pocket coolant capable

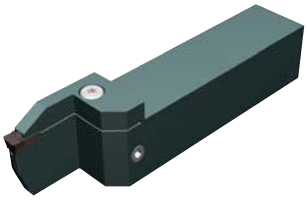
WGCSM-NTC Integral Toolholders • Integral Straight • Metric

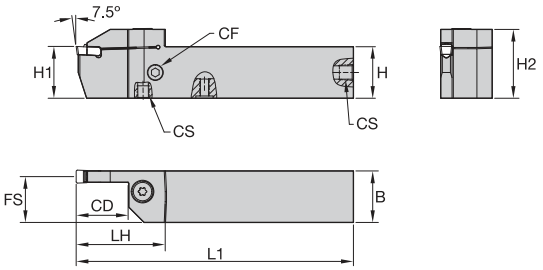


order number	catalogue number	SSC	CD	H1	H	B	F	L1	W	LH
right hand										
6949415	WGCSMR1616K0208	2	8	16	16	16	16	128	2	23
6949416	WGCSMR2020K0208	2	8	20	20	20	20	128	2	23
6949417	WGCSMR2525M0208	2	8	25	25	25	25	153	2	23
6949418	WGCSMR2020K0310	3	10	20	20	20	20	128	3	26
6949419	WGCSMR2525M0310	3	10	25	25	25	25	153	3	26
6949420	WGCSMR2020K0316	3	16	20	20	20	20	128	3	32
6949442	WGCSMR2525M0316	3	16	25	25	25	25	153	3	32
6949444	WGCSMR2525M0412	4	12	25	25	25	25	153	4	28
6949443	WGCSMR2020K0412	4	28	20	20	20	20	128	4	28
left hand										
6949445	WGCSML1616K0208	2	8	16	16	16	16	128	2	23
6949446	WGCSML2020K0208	2	8	20	20	20	20	128	2	23
6949447	WGCSML2525M0208	2	8	25	25	25	25	153	2	23
6949448	WGCSML2020K0310	3	10	20	20	20	20	128	3	10
6949449	WGCSML2525M0310	3	10	25	25	25	25	153	3	26
6949450	WGCSML2020K0316	3	16	20	20	20	20	128	3	32
6949701	WGCSML2525M0316	3	16	25	25	25	25	153	3	32
6949703	WGCSML2525M0412	4	12	25	25	25	25	153	4	28
6949702	WGCSML2020K0412	4	28	20	20	20	20	128	4	28

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WGC Integral Toolholders • Straight • Metric

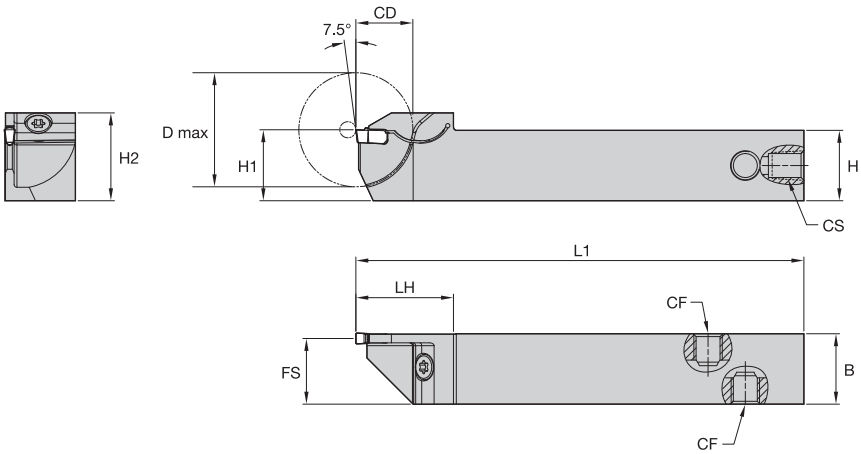




order number	catalogue number	SSC	CD	H1	H	B	H2	L1	FS	LH	CF	CS
right hand												
6461946	WGCSMR2020K0216	2	16	20	20	20	27	125	19	31	—	—
6461948	WGCSMR2525M0216	2	16	25	25	25	32	150	24	31	—	—
6461950	WGCSMR2020K0222	2	22	20	20	20	29	125	19	38	—	—
6461952	WGCSMR2525M0226	2	26	25	25	25	34	150	24	42	—	—
6462003	WGCSMR2020K0316C	3	16	20	20	20	29	125	19	37	M8X1	M8X1
6462004	WGCSMR2525M0316C	3	16	25	25	25	34	150	24	37	G 1/8	G 1/8
6462005	WGCSMR2020K0322C	3	22	20	20	20	30	125	19	43	M8X1	M8X1
6462006	WGCSMR2525M0326C	3	26	25	25	25	35	150	24	47	G 1/8	G 1/8
6462007	WGCSMR2020K0416C	4	16	20	20	20	29	125	18	37	M8X1	M8X1
6462008	WGCSMR2525M0416C	4	16	25	25	25	34	150	23	37	G 1/8	G 1/8
6462009	WGCSMR2020K0422C	4	22	20	20	20	30	125	18	43	M8X1	M8X1
6462010	WGCSMR2525M0426C	4	26	25	25	25	35	150	23	47	G 1/8	G 1/8
6462061	WGCSMR3232P0426C	4	26	32	32	32	42	170	30	47	G 1/8	G 1/8
6462062	WGCSMR3232P0432C	4	32	32	32	32	42	170	30	53	G1/8-28	G1/8-28
6462063	WGCSMR2525M0516C	5	16	25	25	25	34	150	23	37	G 1/8	G 1/8
6462064	WGCSMR2525M0526C	5	26	25	25	25	35	150	23	47	G1/8-28	G1/8-28
6462065	WGCSMR3232P0526C	5	26	32	32	32	42	170	30	47	G 1/8	G 1/8
6462066	WGCSMR3232P0532C	5	32	32	32	32	42	170	30	53	G 1/8	G 1/8
6462067	WGCSMR2525M0616C	6	16	25	25	25	34	150	22	37	G 1/8	G 1/8
6462068	WGCSMR2525M0626C	6	26	25	25	25	35	150	22	47	G1/8-28	G1/8-28
6462069	WGCSMR3232P0626C	6	26	32	32	32	42	170	29	47	G 1/8	G 1/8
6462070	WGCSMR3232P0632C	6	32	32	32	32	44	170	29	55	G 1/8	G 1/8
6462071	WGCSMR4040R0640C	6	40	40	40	40	52	200	37	63	G 1/8	G 1/8
6462072	WGCSMR2525M0826C	8	26	25	25	25	36	150	21	49	G 1/8	G 1/8
6462073	WGCSMR3232P0826C	8	26	32	32	32	43	170	28	49	G 1/8	G 1/8
6462074	WGCSMR3232P0832C	8	32	32	32	32	44	170	28	55	G 1/8	G 1/8
6462075	WGCSMR4040R0840C	8	40	40	40	40	52	200	36	63	G1/8-28	G1/8-28
6462076	WGCSMR3232P1032C	10	32	32	32	32	44	170	28	55	G 1/8	G 1/8
6462077	WGCSMR4040R1040C	10	40	40	40	40	52	200	36	63	G 1/8	G 1/8
left hand												
6461954	WGCSML2020K0216	2	16	20	20	20	27	125	19	31	—	—
6461956	WGCSML2525M0216	2	16	25	25	25	32	150	24	31	—	—
6461958	WGCSML2020K0222	2	22	20	20	20	29	125	19	38	—	—
6461960	WGCSML2525M0226	2	26	25	25	25	34	150	24	42	—	—
6462078	WGCSML2020K0316C	3	16	20	20	20	29	125	19	37	M8X1	M8X1
6462079	WGCSML2525M0316C	3	16	25	25	25	34	150	24	37	G 1/8	G 1/8
6462080	WGCSML2020K0322C	3	22	20	20	20	30	125	19	43	M8X1	M8X1
6462091	WGCSML2525M0326C	3	26	25	25	25	35	150	24	47	G 1/8	G 1/8
6462092	WGCSML2020K0416C	4	16	20	20	20	29	125	18	37	M8X1	M8X1
6462093	WGCSML2525M0416C	4	16	25	25	25	34	150	23	37	G 1/8	G 1/8
6462094	WGCSML2020K0422C	4	22	20	20	20	30	125	18	43	M8X1	M8X1
6462095	WGCSML2525M0426C	4	26	25	25	25	35	150	23	47	G 1/8	G 1/8
6462096	WGCSML3232P0426C	4	26	32	32	32	42	170	30	47	G1/8-28	G1/8-28
6462097	WGCSML3232P0432C	4	32	32	32	32	42	170	30	53	G 1/8	G 1/8
6462098	WGCSML2525M0516C	5	16	25	25	25	34	150	23	37	G1/8-28	G1/8-28
6462099	WGCSML2525M0526C	5	26	25	25	25	35	150	23	47	G 1/8	G 1/8
6462100	WGCSML3232P0526C	5	26	32	32	32	42	170	30	47	G 1/8	G 1/8
6462101	WGCSML3232P0532C	5	32	32	32	32	42	170	30	53	G 1/8	G 1/8
6462102	WGCSML2525M0616C	6	16	25	25	25	34	150	22	37	G 1/8	G 1/8
6462103	WGCSML2525M0626C	6	26	25	25	25	35	150	22	47	G 1/8	G 1/8
6462104	WGCSML3232P0626C	6	26	32	32	32	42	170	29	47	G 1/8	G 1/8
6462105	WGCSML3232P0632C	6	32	32	32	32	44	170	29	55	G 1/8	G 1/8
6462106	WGCSML4040R0640C	6	40	40	40	40	52	200	37	63	G1/8-28	G1/8-28
6462107	WGCSML2525M0826C	8	26	25	25	25	36	150	21	49	G1/8-28	G1/8-28
6462108	WGCSML3232P0826C	8	26	32	32	32	43	170	28	49	G 1/8	G 1/8
6462109	WGCSML3232P0832C	8	32	32	32	32	44	170	28	55	G1/8-28	G1/8-28
6462110	WGCSML4040R0840C	8	40	40	40	40	52	200	36	63	G 1/8	G 1/8
6462111	WGCSML3232P1032C	10	32	32	32	32	44	170	28	55	G 1/8	G 1/8
6462112	WGCSML4040R1040C	10	40	40	40	40	52	200	36	63	G 1/8	G 1/8

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WGCSCF • Integral Toolholders • Reinforced Front Clamp • Metric

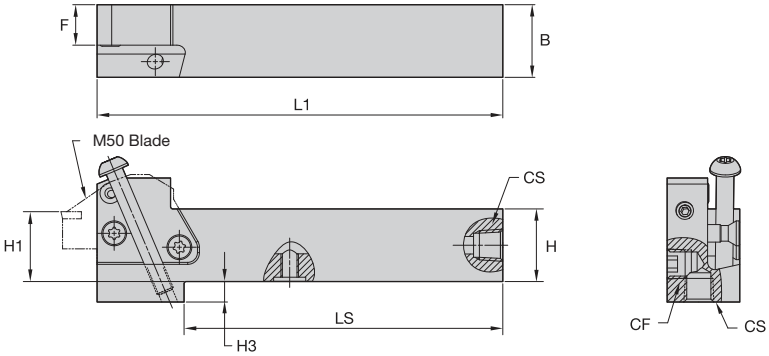


order number	catalogue number	SSC	CD	D max	H1	H	B	H2	L1	FS	LH	CF
right hand												
6765977	**WGCSCFR1010K0210**	2	10	20	10	10	10	14	125	9	21	—
6765978	**WGCSCFR1212K0216**	2	16	32	12	12	12	16	125	11	27	—
6765980	**WGCSCFR1616K0216**	2	16	32	16	16	16	21	125	15	27	—
6766062	**WGCSCFR2020K0216**	2	16	32	20	20	20	25	125	19	27	—
6765979	**WGCSCFR1212K0316C**	3	16	32	12	12	12	17	125	11	28	M8X1
6766061	**WGCSCFR1616K0316C**	3	16	32	16	16	16	18	125	15	28	M8X1
6766063	**WGCSCFR2020K0316C**	3	16	32	20	20	20	25	125	19	28	M8X1
left hand												
6766064	**WGCSCFL1010K0210**	2	10	20	10	10	10	14	125	9	21	—
6766065	**WGCSCFL1212K0216**	2	16	32	12	12	12	16	125	11	27	—
6766067	**WGCSCFL1616K0216**	2	16	32	16	16	16	21	125	15	27	—
6766069	**WGCSCFL2020K0216**	2	16	32	20	20	20	25	125	19	27	—
6766066	**WGCSCFL1212K0316C**	3	16	32	12	12	12	17	125	11	28	M8X1
6766068	**WGCSCFL1616K0316C**	3	16	32	16	16	16	21	125	15	28	M8X1
6766070	**WGCSCFL2020K0316C**	3	16	32	20	20	20	25	125	19	28	M8X1

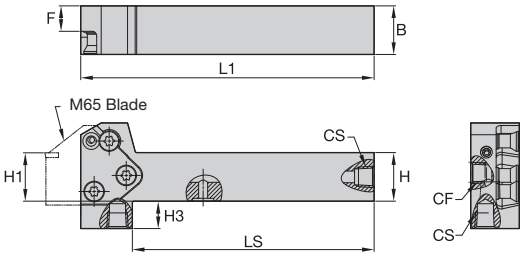
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WGC • Modular Toolholder • Straight • with Coolant • Metric

M50 Blade
Right Hand



M65 Blade
Left Hand



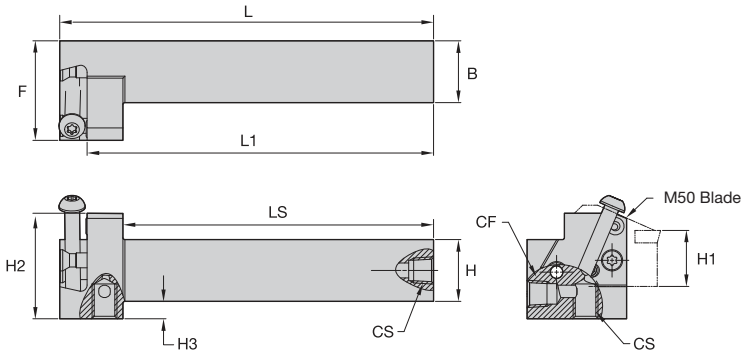
order number	catalogue number	B	H	H1	L1	F	CS	CF	LS	H3	blade size
right hand											
6499222	**WGCMSR2525M50C**	25	25	25	138,75	13,84	G 1/8-28	G 1/8-28	109,00	7,00	50
6499223	**WGCMSR2525M65C**	25	25	25	150,00	13,00	G 1/8-28	G 1/8-28	122,00	—	65
6499224	**WGCMSR3232P50C**	32	32	32	158,75	20,08	G 1/8-28	G 1/8-28	133,62	—	50
6499225	**WGCMSR3232P65C**	32	32	32	170,00	20,00	G 1/8-28	G 1/8-28	142,00	21,75	65
left hand											
6499226	**WGCMSL2525M50C**	25	25	25	138,75	13,84	G 1/8-28	G 1/8-28	109,00	7,00	50
6499227	**WGCMSL2525M65C**	25	25	25	150,00	13,00	G 1/8-28	G 1/8-28	122,00	29,00	65
6499228	**WGCMSL3232P50C**	32	32	32	158,75	20,08	G 1/8-28	G 1/8-28	133,62	—	50
6499229	**WGCMSL3232P65C**	32	32	32	170,00	20,00	G 1/8-28	G 1/8-28	142,00	21,75	65

NOTE: WGCMS..: Right-hand holder uses right-hand blades.
WGCME..: Right-hand holder uses left-hand blades.
M50 blade and clamp screw torque equals 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

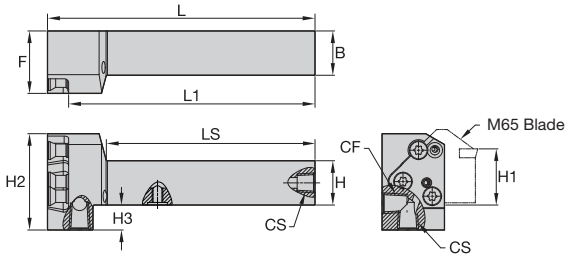
screw catalogue number	screw order number	torque Nm	torque in. lbs.	thread	socket	wrench catalogue number	wrench order number
MS1160	**1099645**	**7**	**62**	**M5**	**T20**	**KT20**	**1022703**
MS1162	**1127019**	**9**	**80**	**M6**	**T25**	**KT25**	**1022725**
MS1163	**1124104**	**18**	**159**	**M8**	**T30**	**KT30L**	**1099676**
MS1273	**1020977**	**4**	**35.4**	**M4**	**T15**	**KT15**	**1022701**
MS1490	**2263299**	**17**	**151**	**M8**	**T45**	**KT45**	**1018227**
MS1595	**1094300**	**12**	**106**	**M6**	**T30**	**KT30**	**1099676**
MS1970	**1106668**	**12**	**106**	**M6**	**T30**	**KT30**	**1099676**
MS2002	**1621087**	**9**	**80**	**M6**	**T25**	**KT25**	**1022725**
MS2091	**1931147**	**9**	**80**	**M5**	**25IP**	**K25IP**	**2050113**

WGC • Modular Toolholder • Endmount • with Coolant • Metric

M50 Blade
Right Hand



M65 Blade
Left Hand



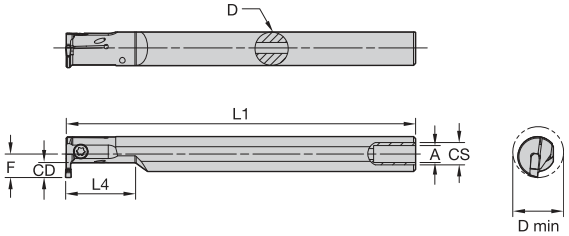
order number	catalogue number	B	H	H1	L	L1	LS	F	CS	CF	H2	H3	blade size
right hand													
6498953	**WGCMER2525M65C**	25	25	25	150,00	138,15	117,00	35,00	G 1/8-28	G 1/8-28	54,00	14,00	65
6498954	**WGCMER2525M50C**	25	25	25	150,25	139,25	125,25	0,98	G 1/8-28	G 1/8-28	42,41	7,00	50
6498955	**WGCMER3232P65C**	32	32	32	170,00	158,15	137,00	35,00	G 1/8-28	G 1/8-28	54,00	7,00	65
6498956	**WGCMER3232P50C**	32	32	32	170,25	159,25	145,25	0,98	G 1/8-28	G 1/8-28	42,41	—	50
left hand													
6498957	**WGCMEL2525M65C**	25	25	25	150,00	138,15	117,00	35,00	G 1/8-28	G 1/8-28	54,00	14,00	65
6498958	**WGCMEL2525M50C**	25	25	25	150,25	139,25	125,25	0,98	G 1/8-28	G 1/8-28	42,41	7,00	50
6498959	**WGCMEL3232P65C**	32	32	32	170,00	158,15	137,00	35,00	G 1/8-28	G 1/8-28	54,00	7,00	65
6498960	**WGCMEL3232P50C**	32	32	32	170,25	159,25	145,25	0,98	G 1/8-28	G 1/8-28	42,41	—	50

NOTE: WGCMS..: Right-hand holder uses right-hand blades.
WGCME..: Right-hand holder uses left-hand blades.
M50 blade and clamp screw torque equals 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

screw catalogue number	screw order number	torque Nm	torque in. lbs.	thread	socket	wrench catalogue number	wrench order number
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	M4	T15	**KT15**	**1022701**
MS1490	**2263299**	17	151	M8	T45	**KT45**	**1018227**
MS1595	**1094300**	12	106	M6	T30	**KT30**	**1099676**
MS1970	**1106668**	12	106	M6	T30	**KT30**	**1099676**
MS2002	**1621087**	9	80	M6	T25	**KT25**	**1022725**
MS2091	**1931147**	9	80	M5	25IP	**K25IP**	**2050113**

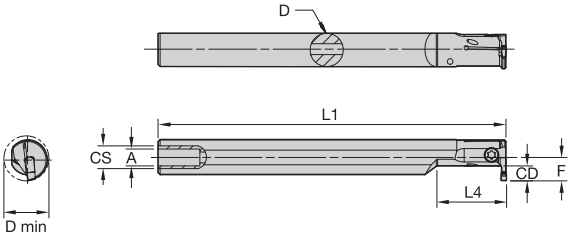
WGC Integral Boring Bars

Right Hand



Right Hand

Left Hand

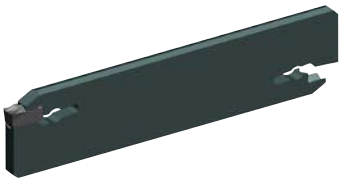


Left Hand

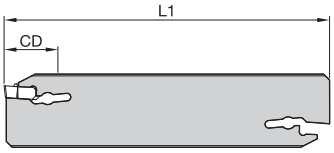
order number	catalogue number	SSC	D	D min	CD	F	L1	LS
right hand								
6948205	A12KWGCEMR0205M	2	12	16	5	9	125	108
6948206	A16MWGCEMR0207M	2	16	20	7	11	150	126
6948207	A20QWGCEMR0207M	2	20	25	7	13	180	149
6948208	A25RWGCEMR0210M	2	25	32	10	17	200	167
6948209	A16MWGCEMR0307M	3	16	20	7	11	150	126
6948210	A20QWGCEMR0307M	3	20	25	7	13	180	153
6948361	A25RWGCEMR0310M	3	25	32	10	17	200	169
6948362	A25RWGCEMR0410M	4	25	32	10	17	200	167
left hand								
6948363	A12KWGCEML0205M	2	12	16	5	9	125	108
6948364	A16MWGCEML0207M	2	16	20	7	11	150	126
6948365	A20QWGCEML0207M	2	20	25	7	13	180	149
6948366	A25RWGCEML0210M	2	25	32	10	17	200	167
6948367	A16MWGCEML0307M	3	16	20	7	11	150	126
6948368	A20QWGCEML0307M	3	20	25	7	13	180	153
6948369	A25RWGCEML0310M	3	25	32	10	17	200	169
6948370	A25RWGCEML0410M	4	25	32	10	17	200	167

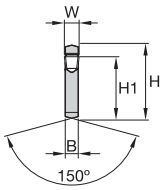
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WGC • Double-Ended Cut-Off Blade

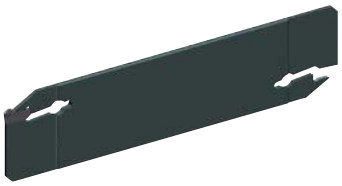


Straight

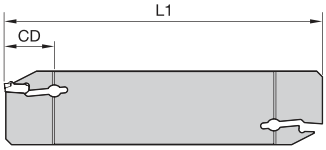


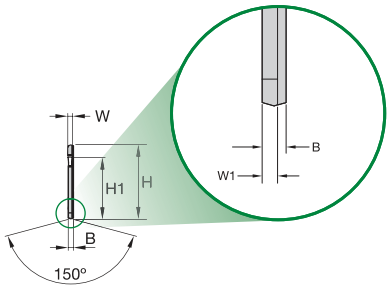


Straight



Reinforced





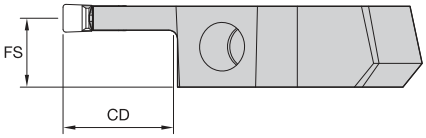
Reinforced

order number	catalogue number	SSC	H	W	W1	H1	L1	B	CD
neutral hand									
6498987	**WGCBSN19G1B14**	1B	19	1,4	1,15	15,5	90	1,80	14
6498988	**WGCBSN26J1B15**	1B	26	1,4	1,15	21,5	110	1,80	15
6498989	**WGCBSN19G1F16**	1F	19	1,6	1,30	15,5	90	1,80	16
6498990	**WGCBSN26J1F17**	1F	26	1,6	1,30	21,5	110	1,80	17
6499211	**WGCBSN19G0220**	2	19	2,0	—	15,5	90	1,65	20
6499212	**WGCBSN26J0230**	2	26	2,0	—	21,5	110	1,65	30
6499213	**WGCBSN32M0250**	2	32	2,0	—	25,1	150	1,65	50
6499214	**WGCBSN26J0340**	3	26	3,0	2,40	21,5	110	2,40	40
6499215	**WGCBSN32M0350**	3	32	3,0	2,40	25,1	150	2,40	50
6499216	**WGCBSN26J0440**	4	26	4,0	3,40	21,5	110	3,40	40
6499217	**WGCBSN32M0450**	4	32	4,0	3,40	25,1	150	3,40	50
6499218	**WGCBSN32M0560**	5	32	5,0	4,40	25,1	150	4,40	60
6499219	**WGCBSN32M0660**	6	32	6,0	5,40	25,1	150	5,40	60
6499220	**WGCBSN32M0860**	8	32	8,0	7,00	25,1	150	7,00	60
6499221	**WGCBSN52X08120**	8	53	8,0	7,00	45,3	260	7,00	120

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WGCM-S-C • WGC Modular Straight Blade with Coolant

Left Hand

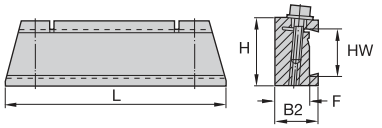


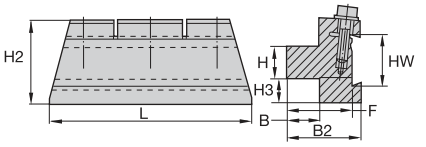
Left Hand

order number	catalogue number	SSC	CD	FS	blade size
right hand					
6498457	WGCM50R1F12M	1F	12,0	11,00	50
6498458	WGCM50R0212M	2	12,0	10,88	50
6498459	WGCM50R0216M	2	16,0	10,88	50
6498460	WGCM50R0312MC	3	12,0	10,43	50
6498861	WGCM50R0322MC	3	22,0	10,43	50
6498862	WGCM50R0412MC	4	12,0	9,93	50
6498863	WGCM50R0422MC	4	22,0	9,93	50
6498864	WGCM50R0432MC	4	32,0	9,93	50
6498865	WGCM50R0512MC	5	12,0	9,43	50
6498866	WGCM50R0516MC	5	16,0	9,43	50
6498867	WGCM50R0526MC	5	26,0	9,43	50
6498868	WGCM50R0532MC	5	32,0	9,43	50
6498869	WGCM65R0616MC	6	16,0	9,88	65
6498870	WGCM65R0626MC	6	26,0	9,88	65
6498881	WGCM65R0632MC	6	32,0	9,88	65
6498882	WGCM65R0816MC	8	16,0	9,00	65
6498883	WGCM65R0826MC	8	26,0	9,00	65
left hand					
6498884	WGCM50L1F12M	1F	12,0	11,00	50
6498885	WGCM50L0212M	2	12,0	10,88	50
6498886	WGCM50L0216M	2	16,0	10,88	50
6498887	WGCM50L0312MC	3	12,0	10,43	50
6498888	WGCM50L0322MC	3	22,0	10,43	50
6498889	WGCM50L0412MC	4	12,0	9,93	50
6498890	WGCM50L0422MC	4	22,0	9,93	50
6498891	WGCM50L0432MC	4	32,0	9,93	50
6498892	WGCM50L0512MC	5	12,0	9,43	50
6498893	WGCM50L0516MC	5	16,0	9,43	50
6498894	WGCM50L0526MC	5	26,0	9,43	50
6498895	WGCM50L0532MC	5	32,0	9,43	50
6498896	WGCM65L0616MC	6	16,0	9,88	65
6498897	WGCM65L0626MC	6	26,0	9,88	65
6498898	WGCM65L0632MC	6	32,0	9,88	65
6498899	WGCM65L0816MC	8	16,0	9,00	65
6498900	WGCM65L0826MC	8	26,0	9,00	65

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.
Through the pocket coolant available in seat sizes 3 and higher.

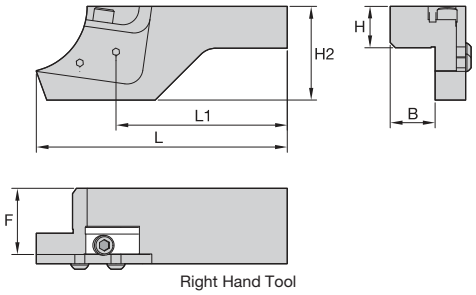
WGC • Blade Holders • Metric





order number	catalogue number	HW	H	B	F	H2	B2	H3	L
2007826	**12251222000**	26	20,0	18,0	33,0	40	38	8	100
2021635	**12251222500**	32	25,0	20,0	35,0	50	40	10	125
2008159	**12251233200**	53	32,0	25,0	50,0	82	57	30	160
2021723	**12251234000**	53	40,0	40,0	58,0	82	65	22	160

Universal Style Toolholder • 76mm Bar Capacity



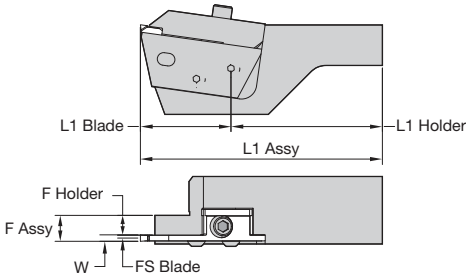
order number	catalogue number	B	H	H2	F	L1	L	support blade screw	clamp screw
right hand									
3538739	**206411**	27,00	25,00	56,36	39,78	102,96	150,85	**MS1072**	**MS352**
3615306	**206443**	27,00	32,00	56,36	39,78	102,96	150,85	**MS1072**	**MS1294**

NOTE: Support blade requires two screws.
Order blades separately.

Components

W	L1	FS	left hand clamp	support blade	right hand clamp
3.0	57,05	1,27	**435137**	**309111**	**435136**
4.0	57,05	1,84	**435106**	**309105**	**435103**

NOTE: All components ship separately.



L1 Assy = L1 (holder) + L1 (blade)
F Assy = F (holder) + FS (blade) + W/2

Coolant Kit

Kit Description	Order Number	Shank Size	Coolant Pressure	1/16 NPTF MALE TO JIC MALE (6145374)	1/8 NPTF MALE TO JIC MALE (6145375)	M8 X 1.25 MALE TO JIC MALE (6145378)	M8 X 1.0 MALE TO JIC MALE (6475041)	G1/8 MALE TO JIC MALE (6145376)	M10 MALE TO JIC MALE (6145377)	MALE JIC TO FEMALE JIC ELBOW (6145379)	HEAVY-DUTY 200MM COOLANT HOSE (6145380)	HEAVY-DUTY 300MM COOLANT HOSE (6145381)	UNIV 200MM FLEX COOLANT HOSE (6432549)	UNIV 300MM FLEX COOLANT HOSE (6432550)	M8X1.0 BANJO 200MM FLEX HOSE (6475043)	G1/8 BANJO 200MM FLEX HOSE (6475045)	M8X1.0 BANJO 300MM FLEX HOSE (6475047)	G1/8 BANJO 300MM FLEX HOSE (6475049)
Universal 200mm flex hose coolant kit	**6475019**	12–40mm 1/2–1-1/2"	200 Bar 2901 psi		•	•	•	•	•	•			•					
Universal 300mm flex hose coolant kit	**6475021**	12–40mm 1/2–1-1/2"	200 Bar 2901 psi	•	•	•	•	•	•	•				•				
M8x1.0 banjo 200mm flex hose coolant kit	**6475023**	12–20mm 1/2–3/4"	200 Bar 2901 psi					•	•	•					•			
M8x1.0 banjo 300mm flex hose coolant kit	**6475025**	12–20mm 1/2–3/4"	200 Bar 2901 psi					•	•	•							•	
G 1/8 banjo 200mm flex hose coolant kit	**6475027**	25–40mm 1–1-1/2"	200 Bar 2901 psi					•	•	•						•		
G 1/8 banjo 300mm flex hose coolant kit	**6475029**	25–40mm 1–1-1/2"	200 Bar 2901 psi					•	•	•								•
Universal 200mm heavy-duty coolant kit	**6145372**	25–40mm 1–1-1/2"	350 Bar* 5076 psi*	•	•			•	•	•	•							
Universal 300mm heavy-duty coolant kit	**6145373**	25–40mm 1–1-1/2"	350 Bar* 5076 psi*	•	•			•	•	•		•						

** Max pressure for seat size 02 holders is 200 bar/2901 psi.*

Individual Kit Component List

order number	catalogue number	description
6145374	1-16NPTF-JIC	Straight fitting, 1/16 NPTF male thread to JIC male thread
6145375	1-8NPTF-JIC	Straight fitting, 1/8 NPTF male thread to JIC male thread
6145378	M8X1.25-JIC	Straight fitting, M8 x 1.25 male thread to JIC male thread
6475041	M8X1-JIC	Straight fitting, M8 x 1.0 male thread to JIC male thread
6145376	G18-JIC	Straight fitting, G 1/8 male thread to JIC male thread
6145377	M10X1.5-JIC	Straight fitting, M10 x 1.5 male thread to JIC male thread
6145379	JICM-JICF-ELB	Elbow fitting, male JIC thread to female JIC thread
6145380	COOL-HOSE-200-HD	Heavy Duty 200mm Coolant hose with JIC female fitting both ends
6145381	COOL-HOSE-300-HD	Heavy Duty 300mm Coolant hose with JIC female fitting both ends
6432549	COOL-HOSE-200-FLEX	Flexible braided 200mm Coolant hose with JIC female fitting both ends
6432550	COOL-HOSE-300-FLEX	Flexible braided 300mm Coolant hose with JIC female fitting both ends
6475043	M8X1-BAN-JIC-HOSE-200	Flexible braided 200mm Coolant hose, M8 x 1.0 male thread to JIC female thread. Contains (1) M8x1.0 banjo bolt and (2) M8 bonded washers
6475045	G18-BAN-JIC-HOSE-200	Flexible braided 200mm Coolant hose, G 1/8 male thread to JIC female thread. Contains (1) G 1/8 banjo bolt and (2) G 1/8 bonded washers
6475047	M8X1-BAN-JIC-HOSE-300	Flexible braided 300mm Coolant hose, M8 x 1.0 male thread to JIC female thread. Contains (1) M8x1.0 banjo bolt and (2) M8 bonded washers
6475049	G18-BAN-JIC-HOSE-300	Flexible braided 300mm Coolant hose, G 1/8 male thread to JIC female thread. Contains (1) G 1/8 banjo bolt and (2) G 1/8 bonded washers

Individual Kit Component List

The items shown below are not part of any coolant kits shown on previous pages.

order number	catalogue number	description
6145382	M6X1-JIC	Straight fitting, M6 x 1.0 male thread to JIC male thread
6145383	JICM-JICM-STR	Straight fitting, JIC male thread to JIC male thread
6145386	G14-G18-RED	Straight fitting, G 1/4 male thread to G 1/8th male thread
6475058	R18-JIC	Straight fitting, 1/8 BSPT male thread to JIC male thread
6475059	R14-JIC	Straight fitting, 1/4 BSPT male thread to JIC male thread

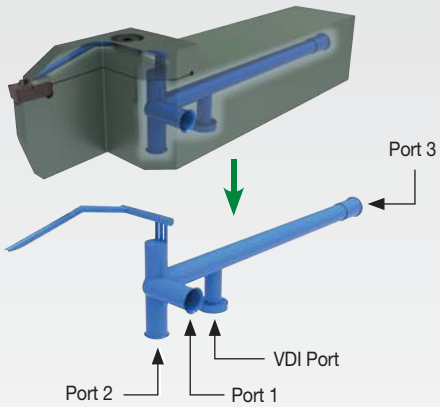
Coolant Spare Parts

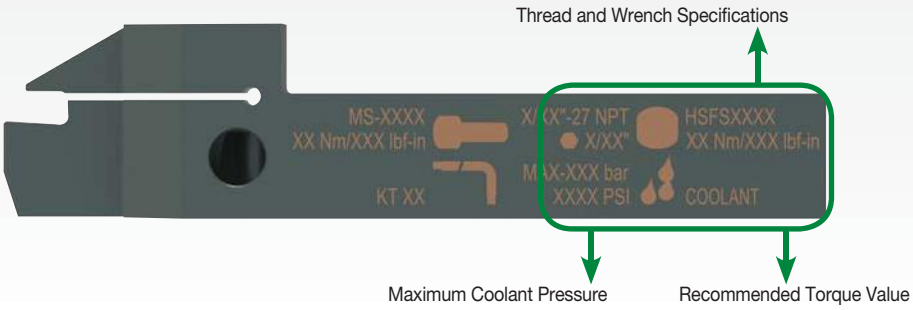
Included in kits; part of components.

order number	catalogue number	description
6475051	M8X1-BAN-BOLT	Banjo bolt, M8 x 1.0 male thread
6475053	G18-BAN-BOLT	Banjo bolt, G1/8 male thread
6475060	M6-BON-WASHER	M6 bonded washer
6475055	M8-BON-WASHER	M8 bonded washer
6475061	M10-BON-WASHER	M10 bonded washer
6475056	G18-BON-WASHER	G 1/8 bonded washer

Internal Coolant Delivery Guidelines

1. WGC system capable of 5076 psi (350 bar).
2. Toolholder delivered with four entry holes.
3. A quality filtration system is necessary to prevent blockages in the toolholder that will affect coolant flow and performance.
4. Machines without a proper filtering system may require modification or an inline filter.
   - For pressure >1015 psi [70 bar], use 10–20 µm filter.
   - For pressure <1015 psi [70 bar], 50–100 µm.
   - Using fine filters in low-pressure applications may affect flow rate.





General Safety Guidelines

1. All safety doors and mechanisms must be in place before trying out the internal coolant to avoid any danger to the operator in the event of a failure.
2. Use the correct pipe fittings to connect the holders to the system. Ensure the maximum pressure recommended for the fittings are not exceeded.
3. While implementing pressure >1160 psi [80 bar], increase the pressure in steps to ensure proper functioning of insert clamping and leak-free joints.
4. While indexing inserts, ensure the pocket is free from chips and/or dirt. Also, inspect the insert and make sure there are no blockages in the coolant canal.
5. Periodically check all hoses and fittings for damage and wear for proper functioning of the system. This check should also include filters.

Internal Coolant Delivery Performance

Internal coolant offers a clear advantage in tool life and chip forming/evacuation vs. external coolant in difficult conditions and in high-pressure coolant.

Example: Chipbreaking in plunging of steel.

Flood Coolant

Material steel ST52;
Insert size 6mm; f = 0,25 mm/U

Internal Coolant

1087 psi
(75 bar)

2900 psi
(200 bar)

Low Pressure — If performance is at risk due to low coolant pressure, apply internal coolant in combination with external coolant to increase volume.

Recommendation to improve tool life and/or productivity: Apply high-pressure coolant: 80–350 bar recommended.

VDI Assemblies

The WGC internal coolant delivery can be leveraged with VDI holding systems with both traditional or Quick-Change coolant connections.

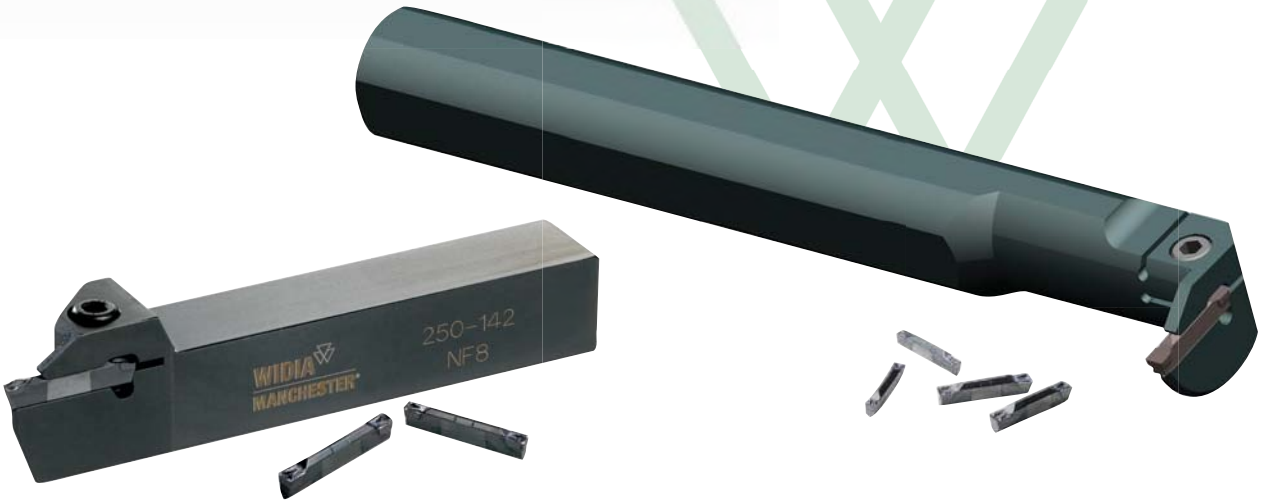
widia.com

WIDIA™

The WMT platform is the economical and reliable option for grooving, cut-off, turning, and profiling applications.

The WMT system, with its extra-long clamping area and precise insert positioning, ensures exceptionally fast and accurate machining, and is an all-in-one tool for demanding operations.

- Specifically designed to increase speeds and feeds.
- Versatile geometry for even your most demanding deep-grooving applications.
- The WMT system enables heavy stock removal in turning applications.
- Ensures finer surface finishes and a long, reliable tool life.
- Extra-long clamping area for unsurpassed grooving and turning stability.
- Interchangeable grooving and cut-off inserts designed for excellent chip control.

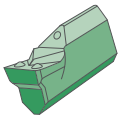


FIVE AVAILABLE CHIPBREAKER STYLES

CM	CM-W	PT	PC	PH
Cut-Off Medium	Cut-Off Medium with Wiper	Groove, Plunge, and Turn	Plunge and Contour	Groove, Plunge, and Turn

RELIABLE ACCURACY WITH WMT™

INSERTS

APPLICATION	TYPES	GROOVE WIDTH	INSERT GEOMETRY	GRADE	MATERIALS
GROOVING		2,0–8,0mm	PT, PH	WU10PT, WU25PT	P M K N S H
FACE GROOVING		3,0–6,35mm	PT, PH	WU10HT	M K N S
CUT-OFF		1,5–4,0mm	CM CM-W	WP10CT, WP25CT	P K
PROFILING		3,0–8,0mm	PC - Full Radius		

APPLICATIONS

TURNING

GROOVING

I.D. GROOVING

FACE GROOVING

CUT-OFF

PROFILING

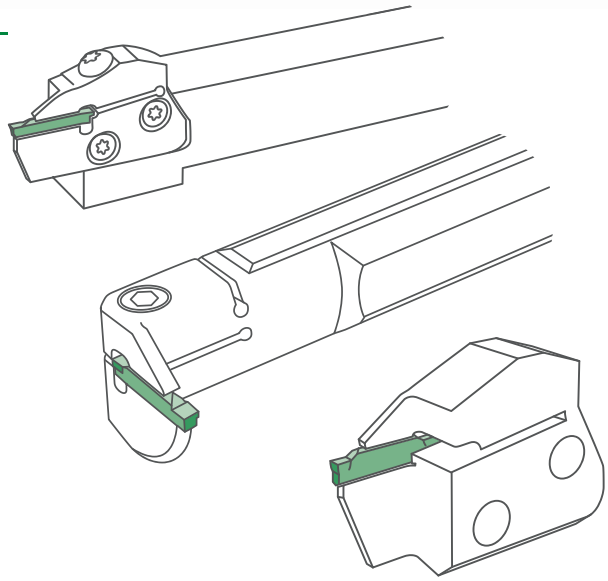
INDUSTRY

TRANSPORTATION

AEROSPACE

ENERGY

GENERAL ENGINEERING



Choosing the Correct WMT Tooling

The Most Advanced Turning Solutions in the Industry

For unsurpassed quality, value, and performance, look no further than the WIDIA™ comprehensive line of specially engineered and dependable grooving and cut-off solutions. All the tools you need from the reliable name you can trust!

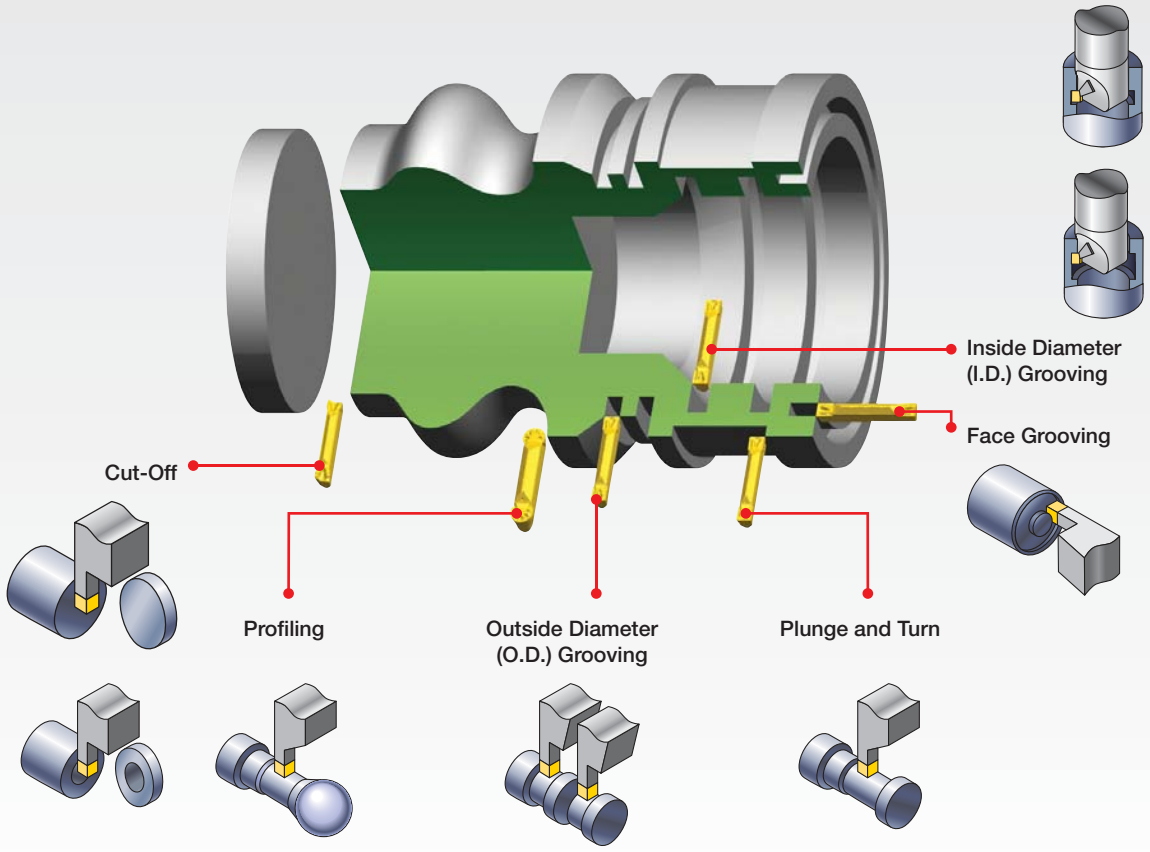
The WMT system, with its extra-long clamping area and precise insert positioning, ensures exceptionally fast and accurate machining, all-in-one tool, for your most demanding grooving, cut-off, turning, and profiling applications.

It is perfect for all general-purpose operations, including both shallow and deep grooving.

Utilize this handy, easy-to-use guide to identify and select the appropriate grooving and cut-off tools for your specific needs.

1 Choose the application to be performed:

Groove depth, width, and profile.



2 Identify the material to be machined:

Each tool has a material grid marked with a letter indicating the materials that can be machined.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

Choosing the Correct WMT Tooling

3 Select your toolholder based on the application:

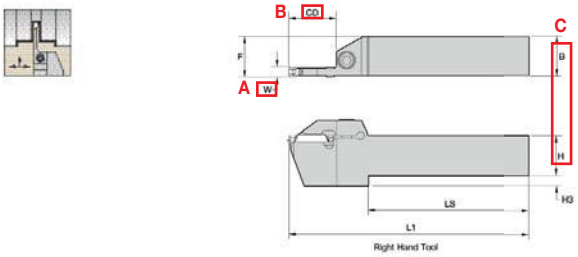
A Choose the appropriate width "W" required for the application.

B Choose the shortest cutting depth "CD" dimension for increased tool rigidity.

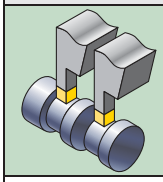
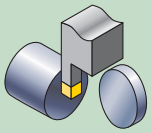
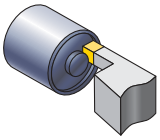
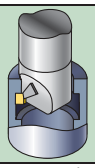
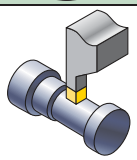
C Select the largest toolholder shank "H" and "B" dimensions for maximum rigidity.

Grooving and Cut-Off • WMT™

WMT Integral Toolholders • Metric



order number	catalogue number	SSC	A W	C H	C B	B CD	F	H3	L1	LS
right hand										
3650516	WMTSR2525M116	1	1,50	25,0	25,0	17	25,0	–	150	116
3539182	WMTCR1212H213	2	2,00	12,0	12,0	–	12,0	–	100	74
5964677	WMTCR1212H216	2	2,00	12,0	12,0	–	12,0	–	100	70
3650456	WMTSR1616K216	2	2,00	16,0	16,0	17	16,0	6	125	93
3650458	WMTSR2020K216	2	2,00	20,0	20,0	17	20,0	–	125	93
3650506	WMTSR2525M216	2	2,00	25,0	25,0	17	25,0	–	150	118
3539172	WMTSR1616K2B19	2B	2,38	16,0	16,0	24	15,9	5	125	88
3539174	WMTSR2020K2B19	2B	2,38	20,0	20,0	24	19,9	5	125	88
3539221	WMTCR2525M2B19	2B	2,38	25,0	25,4	24	24,9	–	150	113
3650460	WMTSR1616K311	3	3,00	16,0	16,0	11	16,0	–	125	93
3650462	WMTSR1616K322	3	3,00	16,0	16,0	22	16,0	5	125	85
3650468	WMTSR2020K311	3	3,00	20,0	20,0	11	20,0	–	125	93
3650470	WMTSR2020K322	3	3,00	20,0	20,0	22	20,0	5	125	85
3650479	WMTSR2525M311	3	3,00	25,0	25,0	11	25,0	–	150	118
3650481	WMTSR2525M322	3	3,00	25,0	25,0	22	25,0	–	150	110
3650502	WMTSR1616K411	4	4,00	16,0	16,0	11	16,0	–	125	92
3650464	WMTSR1616K422	4	4,00	16,0	16,0	22	16,0	5	125	83
3653751	WMTSR2020K22	4	4,00	20,0	20,0	22	20,0	5	125	83
3650504	WMTSR2020K411	4	4,00	20,0	20,0	11	20,0	–	125	92
3653752	WMTSR2525M411	4	4,00	25,0	25,0	11	25,0	–	150	117
3650483	WMTSR2525M422	4	4,00	25,0	25,0	22	25,0	–	150	109
3650473	WMTSR2020K514	5	5,00	20,0	20,0	14	20,0	–	125	88
3650475	WMTSR2020L525	5	5,00	20,0	20,0	25	20,0	5	140	93
3650485	WMTSR2525M514	5	5,00	25,0	25,0	14	25,0	–	150	115
3650487	WMTSR2525M525	5	5,00	25,0	25,0	25	25,0	–	150	104
3650477	WMTSR2020L614	6	6,00	20,0	20,0	14	20,0	–	140	103
3650489	WMTSR2525M614	6	6,00	25,0	25,0	14	25,0	–	150	113
3650491	WMTSR2525M625	6	6,00	25,0	25,0	25	25,0	–	150	104

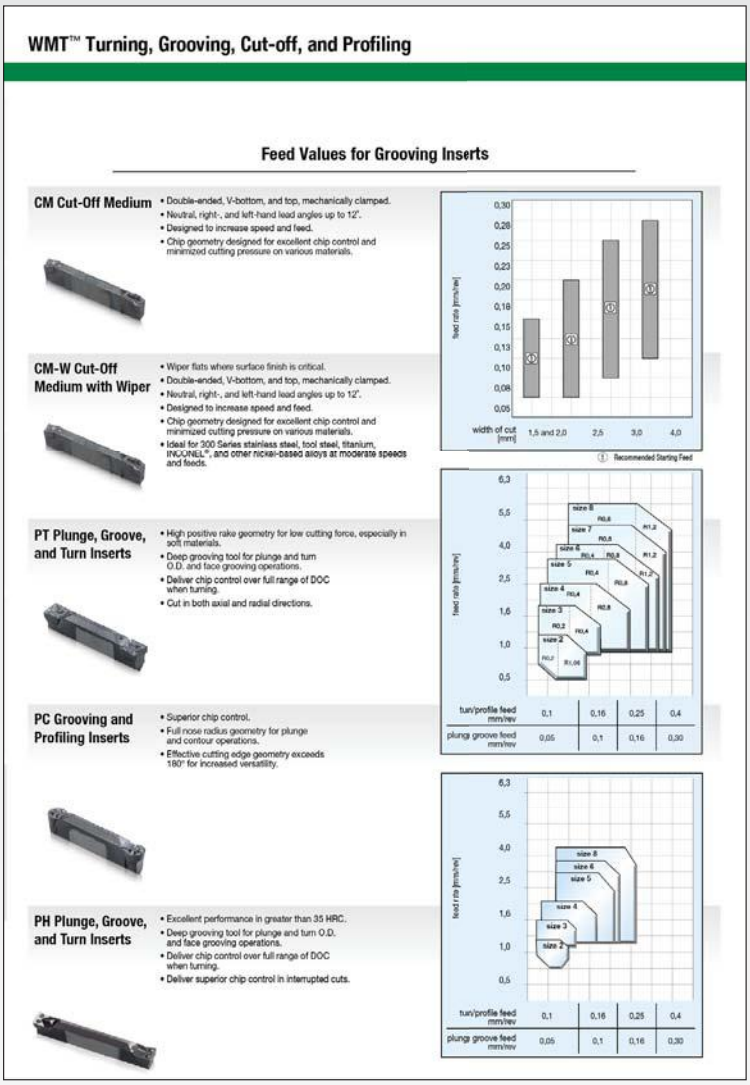
		application	conventional toolholders	modular blades
		O.D. Grooving and Cut-Off	E364–E366	E372
		Face Grooving	E367–E368	E371
		I.D. Grooving	E369	–
		Plunge and Turn	E364–E366	E372

Choosing the Correct WMT Tooling

4 Select chipbreaker style for the application:

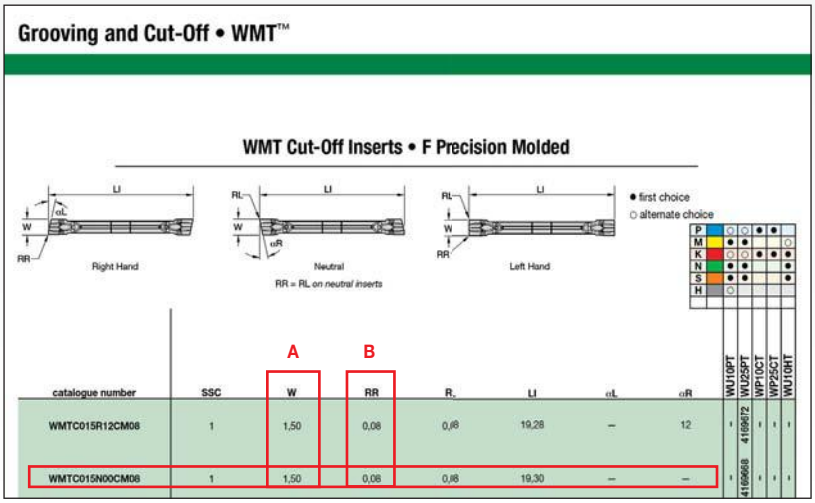
CM Cut-Off Medium
CM-W Cut-Off Medium with Wiper
PT Groove, Plunge, and Turn
PC Plunge and Contour
PH Groove, Plunge, and Turn

NOTE: Chart shows recommended starting feed rates.



A Choose the appropriate insert width "W" for your specific application.

B Select the required corner radius value "RR".



Choosing the Correct WMT Tooling

5 Select grade:

Grooving cutting condition		Recommended Grades					
		steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
heavily interrupted cut		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	–
lightly interrupted cut		WP25CT/ WU25PT	WU25PT	WP25CT/ WU25PT	WU25PT	WU25PT	–
varying depth of cut, casting, or forging skin		WU10PT	WU10PT	WP10CT/ WU10PT	WU10PT	WU10HT/ WU10PT	WU10PT
smooth cut, pre-turned surface		WP10CT/ WU10PT	WU10PT	WP10CT/ WU10PT	WU10PT	WU10HT/ WU10PT	WU10PT

Cut-Off cutting condition		Recommended Grades					
		steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
heavily interrupted cut		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	–
lightly interrupted cut		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	–
varying depth of cut, casting, or forging skin		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	WU25PT
smooth cut, pre-turned surface		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	WU25PT

NOTE: See page E347 for Grades and Grade Descriptions.

6 Determine cutting data:

A Based on material group and grade, identify starting speed (vc).

B First choice starting speed is in bold.

NOTE: See page E349 for cutting data.

Grooving and Cut-Off • WMT™

Recommended Cutting Speeds • Metric

Material Group		WU10HT min	WU10HT Start	WU10HT max	WU10PT min	WU10PT Start	WU10PT max	WU25PT min	WU25PT Start	WU25PT max	WP10CT min	WP10CT Start	WP10CT max	WP25CT min	WP25CT Start	WP25CT max
		Cutting Speed – vc m/min														
P	0/1	100	100	110	190	200	210	170	175	180	210	225	240	170	175	180
	A 2	95	95	105	180	185	190	150	160	170	210	220	230	185	195	205
	3	95	95	105	180	185	190	150	160	170	210	220	230	185	195	205
	4	70	70	75	165	170	175	135	145	155	140	145	155	125	125	135
	5	85	90	95	170	175	180	140	150	160	180	190	195	155	165	170
	6	50	50	50	140	150	160	120	125	130	70	75	80	70	75	80
M	1	70	75	80	120	125	130	120	125	130	–	–	–	–	–	–
	2	50	50	50	100	100	110	70	75	80	–	–	–	–	–	–
	3	50	50	50	95	100	105	85	90	95	–	–	–	–	–	–
K	1	85	90	95	190	200	210	155	165	170	215	225	235	180	190	195
	2	75	75	80	185	190	200	155	165	175	205	215	225	175	185	195
	3	70	75	80	170	175	180	140	150	160	210	225	240	190	200	210
	1	70	75	80	140	150	160	110	120	130	–	–	–	–	–	–
	2	70	75	80	140	150	80	110	120	80	–	–	–	–	–	–

Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

Cut-Off

WMT	C	015	N	00	CM	08
Tooling System	Cut-Off	W in mm* 10	Hand of Insert	Main Cutting Edge Lead Angle	Chipbreaker Geometry **CM** = Cut-Off Medium **CM-W** = Cut-Off Medium with Wiper	Corner Radius in mm* 10

Groove, Plunge, Turn, and Contour Inserts

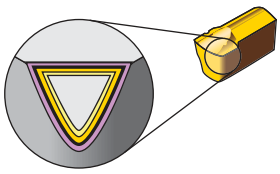
WMT	S	205	M	2	U	02	PT
Tooling System	Square	mm* 10 inch* 1000	Unit of Measurement for Width **M** = mm **I** = inch	Seat Size	Insert Tolerance	Corner Radius in mm* 10	Chipbreaker Geometry **PT** = Groove, Plunge, and Turn **PH** = Groove, Plunge, and Turn **PC** = Plunge and Contour

P = Precision ground grooving width tolerance:
± .001" (0,025mm)

U = Utility molded grooving width tolerance:

3,05–4,05:	+ .006" / -0	(+0,15mm) / -0
5,05–10,05:	+ .010" / -0	(+0,25mm) / -0

Grades and Grade Descriptions

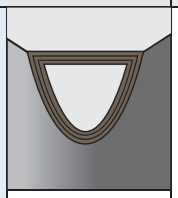
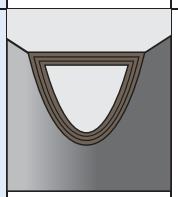
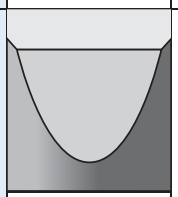
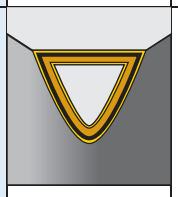
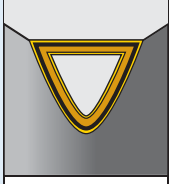


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ⟷ toughness

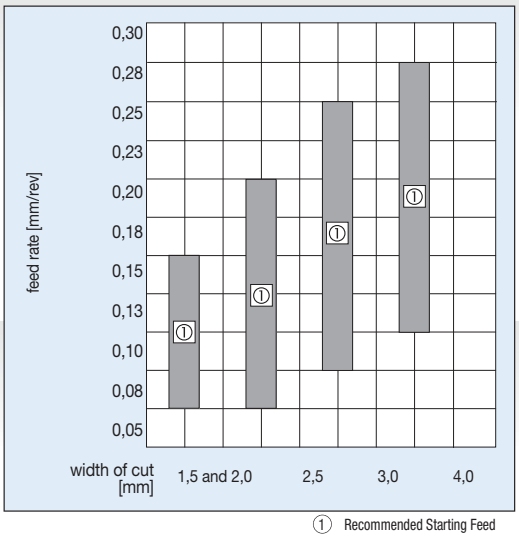
Grade

Coating		Grade Description		05	10	15	20	25	30	35	40	45
WU10PT	 HC-P15	An advanced PVD-TiAlN coating over a very deformation-resistant unalloyed carbide substrate. The WU10PT™ grade's new and improved coating enables speeds to be increased by 50–100%. The WU10PT grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P									
			M									
			K									
			N									
			S									
			H									
WU25PT	 HC-P30	An advanced PVD-TiAlN-coated grade with a tough, ultra-fine-grain, unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P									
			M									
			K									
			N									
			S									
			H									
WU10HT	 HW-K15	A hard, low binder content, unalloyed WC/Co fine-grained uncoated grade. Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys. Superior thermal deformation and depth-of-cut notch resistance. The grain structure is well controlled for minimal pits and flaws, which contributes to long, reliable service.										
			M									
			K									
			N									
			S									
WP10CT	 HC-P10	A specially engineered, proprietary, cobalt-enriched carbide grade with thick K-MTCVD-TiCN coating layer, an Al_2O_3 layer of controlled grain size, and outer layers of TiCN and TiN for maximum wear resistance. An excellent finishing to medium machining grade for a variety of workpiece materials including most steels, ferritic and martensitic stainless steels, and cast irons. The specially engineered cobalt-enriched substrate offers a balanced combination of deformation resistance and edge toughness, while the thick coating layers offer outstanding abrasion resistance and crater wear resistance for high-speed machining. The smooth coating provides good resistance to edge build-up and microchipping and produces excellent surface finishes.	P									
			K									
WP25CT	 HC-P25	A tough cobalt-enriched carbide grade with a newly designed multilayer K-MTCVD TiCN-Al_2O_3-TiCNTiN coating with superior interlayer adhesion. This is the industry's best general-purpose turning grade for most steels and ferritic and martensitic stainless steels. The substrate design, with cobalt-enrichment, ensures adequate deformation resistance along with excellent bulk toughness and insert edge strength. The coating layers offer good wear resistance over a wide range of machining conditions. The smoothness of the coating leads to reduced frictional heat, minimizes microchipping, and improves workpiece surface finishes.	P									
			K									

Feed Values for Grooving Inserts

CM Cut-Off Medium

- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12˚.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimized cutting pressure on various materials.



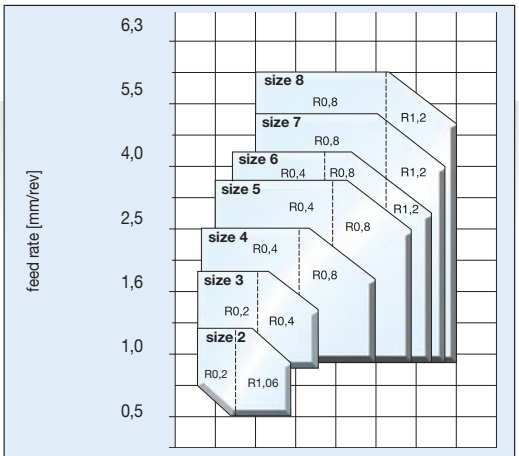
1 Recommended Starting Feed

CM-W Cut-Off Medium with Wiper

- Wiper flats where surface finish is critical.
- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12˚.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimized cutting pressure on various materials.
- Ideal for 300 Series stainless steel, tool steel, titanium, INCONEL®, and other nickel-based alloys at moderate speeds and feeds.

PT Plunge, Groove, and Turn Inserts

- High positive rake geometry for low cutting force, especially in soft materials.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Deliver chip control over full range of DOC when turning.
- Cut in both axial and radial directions.



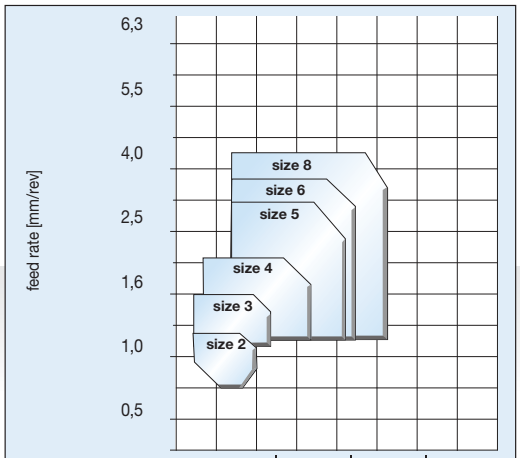
turn/profile feed mm/rev	0,1	0,16	0,25	0,4
plunge groove feed mm/rev	0,05	0,1	0,16	0,30

PC Grooving and Profiling Inserts

- Superior chip control.
- Full nose radius geometry for plunge and contour operations.
- Effective cutting edge geometry exceeds 180° for increased versatility.

PH Plunge, Groove, and Turn Inserts

- Excellent performance in greater than 35 HRC.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Deliver chip control over full range of DOC when turning.
- Deliver superior chip control in interrupted cuts.

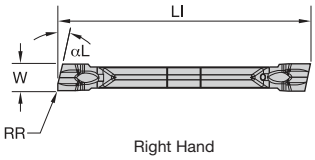


turn/profile feed mm/rev	0,1	0,16	0,25	0,4
plunge groove feed mm/rev	0,05	0,1	0,16	0,30

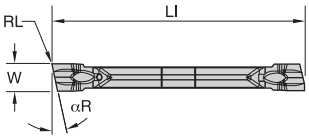
Recommended Cutting Speeds • Metric

Material Group		Cutting Speed — vc m/min														
		WU10HT			WU10PT			WU25PT			WP10CT			WP25CT		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	100	**100**	110	190	**200**	210	170	**175**	180	210	**225**	240	170	**175**	180
	2	95	**95**	105	180	**185**	190	150	**160**	170	210	**220**	230	185	**195**	205
	3	95	**95**	105	180	**185**	190	150	**160**	170	210	**220**	230	185	**195**	205
	4	70	**70**	75	165	**170**	175	135	**145**	155	140	**145**	155	125	**125**	135
	5	85	**90**	95	170	**175**	180	140	**150**	160	180	**190**	195	155	**165**	170
	6	50	**50**	50	140	**150**	160	120	**125**	130	70	**75**	80	70	**75**	80
M	1	70	**75**	80	120	**125**	130	120	**125**	130	–	**–**	–	–	**–**	–
	2	50	**50**	50	100	**100**	110	70	**75**	80	–	**–**	–	–	**–**	–
	3	50	**50**	50	95	**100**	105	85	**90**	95	–	**–**	–	–	**–**	–
K	1	85	**90**	95	190	**200**	210	155	**165**	170	215	**225**	235	180	**190**	195
	2	75	**75**	80	185	**190**	200	155	**165**	175	205	**215**	225	175	**185**	195
	3	70	**75**	80	170	**175**	180	140	**150**	160	210	**225**	240	190	**200**	210
N	1	70	**75**	80	140	**150**	160	110	**120**	130	–	**–**	–	–	**–**	–
	2	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	3	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	4	70	**75**	80	140	**150**	80	110	**120**	80	–	–	–	–	–	–
	5	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	6	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	7	70	**75**	80	140	**150**	120	110	**120**	105	–	**–**	–	–	**–**	–
S	1	20	**25**	30	70	**75**	80	60	**65**	65	–	**–**	–	–	**–**	–
	2	20	**25**	30	65	**65**	70	50	**50**	50	–	**–**	–	–	**–**	–
	3	50	**50**	50	100	**100**	110	70	**75**	80	–	**–**	–	–	**–**	–
	4	-	**–**	–	70	**75**	80	50	**50**	50	–	**–**	–	–	**–**	–
H	1	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–
	2	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–
	3	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–
	4	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–

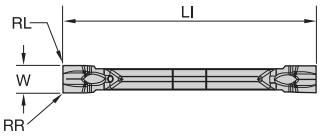
WMT Cut-Off Inserts • F Precision Molded



Right Hand



Neutral



Left Hand

RR = RL *on neutral inserts*

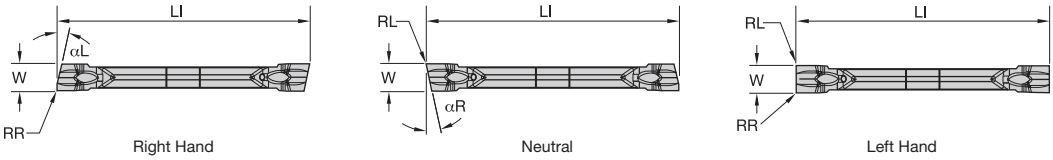
● first choice
○ alternate choice

	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
P	○	○	●	●	
M	●	●			○
K	○	○	●	●	●
N	●	●			●
S	●	●			●
H	○				

catalogue number	SSC	W	RR	RL	LI	αL	αR	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTC015R12CM08	1	1,50	0,08	0,08	19,28	–	12	'	4169672	'	'	'
WMTC015N00CM08	1	1,50	0,08	0,08	19,30	–	–	'	4169668	'	'	'
WMTC015R05CM08	1	1,50	0,08	0,08	19,31	–	5	'	4169670	'	'	'
WMTC015L05CM08	1	1,50	0,08	0,08	19,31	5	–	'	4169671	'	'	'
WMTC020L05CM08	2	1,99	0,08	0,08	19,21	5	–	'	4169677	'	'	'
WMTC020R05CM08	2	1,99	0,08	0,08	19,21	–	5	'	4169675	'	'	'
WMTC020N00CM08	2	2,00	0,08	0,08	19,21	–	–	'	4169673	'	'	'
WMTC020L12CM08	2	2,00	0,08	0,08	19,25	12	–	'	4169680	'	'	'
WMTC020R12CM08	2	2,00	0,08	0,08	19,26	–	12	'	4169678	'	'	'
WMTC094R12CM13	2B	2,39	0,13	0,13	22,28	–	12	'	4169580	'	'	'
WMTC094N00CM13	2B	2,39	0,13	0,13	22,32	–	–	'	4169576	'	'	'
WMTC094R05CM13	2B	2,39	0,13	0,13	22,32	–	5	'	4169578	'	'	'

WMT Cut-Off Inserts • F Precision Molded

(continued)



Right Hand — Neutral — Left Hand

RR = RL *on neutral inserts*

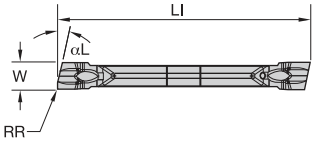
● first choice
○ alternate choice

P	○	○	●	●	
M	●	●			○
K	○	○	●	●	●
N	●	●			●
S	●	●			●
H	○				

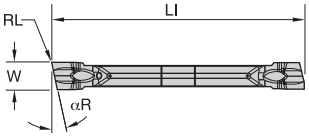
catalogue number	SSC	W	RR	RL	LI	αL	αR	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTC030R05CM17	3	3,00	0,17	0,17	25,40	–	5	'	4169684	'	'	'
WMTC030R12CM17	3	3,00	0,17	0,17	25,40	–	12	'	4169688	'	'	'
WMTC030L12CM17	3	3,00	0,17	0,17	25,40	12	–	'	4169690	'	'	'
WMTC030N00CM17	3	3,00	0,17	0,17	25,40	–	–	'	4169682	'	'	'
WMTC030L05CM17	3	3,00	0,17	0,17	25,40	5	–	'	4169686	'	'	'
WMTC125R05CM17	3	3,17	0,17	0,17	25,40	–	5	'	4169664	'	'	'
WMTC125N00CM17	3	3,17	0,17	0,17	25,41	–	–	'	4169582	'	'	'
WMTC125R12CM17	3	3,18	0,17	0,17	25,40	–	12	'	4169666	'	'	'
WMTC040L12CM17	4	4,00	0,17	0,17	25,40	12	–	'	4169697	'	'	'
WMTC040N00CM17	4	4,00	0,17	0,17	25,40	–	–	'	4169692	'	'	'
WMTC040R12CM17	4	4,00	0,17	0,17	25,40	–	12	'	4169696	'	'	'
WMTC040R05CM17	4	4,00	0,17	0,17	25,40	–	5	'	4169694	'	'	'
WMTC040L05CM17	4	4,00	0,17	0,17	25,40	5	–	'	4169695	'	'	'

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Cut-Off Inserts • F Precision Molded

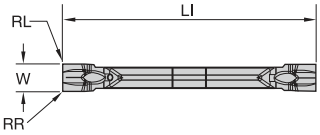


Right Hand



Neutral

RR = RL *on neutral inserts*



Left Hand

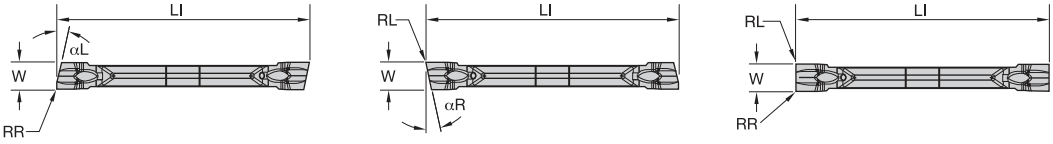
● first choice
○ alternate choice

P	○	○	●	●		
M	●	●				○
K	○	○	●	●		●
N	●	●				●
S	●	●				●
H	○					

catalogue number	SSC	W	RR	RL	LI	αL	αR	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTC015N00CMW08	1	1,50	0,08	0,08	19,30	–	–	'	4169669	'	'	'
WMTC020R05CMW08	2	2,00	0,08	0,08	19,20	–	5	'	4169676	'	'	'
WMTC020N00CMW08	2	2,00	0,08	0,08	19,21	–	–	'	4169674	'	'	'
WMTC020L12CMW08	2	2,00	0,08	0,08	19,27	12	–	'	4169681	'	'	'
WMTC020R12CMW08	2	2,00	0,08	0,08	19,27	–	12	'	4169679	'	'	'
WMTC094R12CMW13	2B	2,39	0,13	0,13	22,29	–	12	'	4169581	'	'	'
WMTC094N00CMW13	2B	2,39	0,13	0,13	22,32	–	–	'	4169577	'	'	'
WMTC094R05CMW13	2B	2,39	0,13	0,13	22,32	–	5	'	4169579	'	'	'
WMTC030R05CMW17	3	3,00	0,17	0,17	25,40	–	5	'	4169685	'	'	'
WMTC030R12CMW17	3	3,00	0,17	0,17	25,40	–	12	'	4169689	'	'	'
WMTC030L12CMW17	3	3,00	0,17	0,17	25,40	12	–	'	4169691	'	'	'
WMTC030N00CMW17	3	3,00	0,17	0,17	25,40	–	–	'	4169683	'	'	'

WMT Cut-Off Inserts • F Precision Molded

(continued)



Right Hand — Neutral — Left Hand

RR = RL *on neutral inserts*

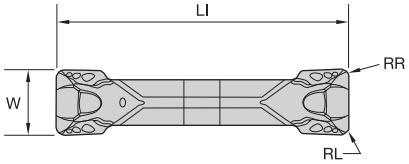
● first choice
○ alternate choice

P	○	○	●	●		
M	●	●				○
K	○	○	●	●	●	●
N	●	●				●
S	●	●				●
H	○					

catalogue number	SSC	W	RR	RL	LI	αL	αR	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTC030L05CMW17	3	3,00	0,17	0,17	25,40	5	–	'	4169687	'	'	'
WMTC125R05CMW17	3	3,17	0,17	0,17	25,41	–	5	'	4169665	'	'	'
WMTC125R12CMW17	3	3,17	0,17	0,17	25,41	–	12	'	4169667	'	'	'
WMTC125N00CMW17	3	3,18	0,17	0,17	25,41	–	–	'	4169663	'	'	'
WMTC040N00CMW17	4	4,00	0,17	0,17	25,40	–	–	'	4169693	'	'	'

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Grooving Inserts • PT Precision Molded



RR = RL

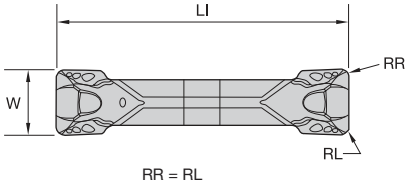
● first choice
○ alternate choice

P		○	○	●	●	
M		●	●			○
K		○	○	●	●	●
N		●	●			●
S		●	●			●
H		○				

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTS205M2U02PT	2	2,13	0,15	19,23	4116131	4116132	4169554	4169555	-
WMTS305M3U03PT	3	3,13	0,31	25,81	4113568	4113569	4169556	4169557	-
WMTS305M3U06PT	3	3,13	0,61	25,78	4113570	4113571	4169558	4169559	-
WMTS405M4U03PT	4	4,13	0,31	25,53	4113577	4113578	4169560	4169561	-
WMTS405M4U06PT	4	4,13	0,61	25,53	4113579	4113580	4169562	4169563	-
WMTS505M5U03PT	5	5,13	0,30	28,76	4116148	4116149	4169564	4169565	-
WMTS505M5U06PT	5	5,13	0,61	28,76	4116150	4116151	4169566	4169567	-
WMTS605M6U03PT	6	6,13	0,30	28,76	4117253	4117254	4169568	4169569	-
WMTS605M6U06PT	6	6,13	0,59	28,76	4117255	4117256	4169570	4169571	-
WMTS805M8U06PT	8	8,13	0,61	28,70	4117261	4117262	4169572	4169573	-
WMTS805M8U15PT	8	8,13	1,50	28,71	4117263	4117264	4169574	4169575	-

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Grooving Inserts • PT Precision Ground



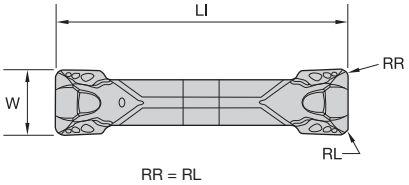
● first choice
○ alternate choice

P		○	○	●	●	
M		●	●			○
K		○	○	●	●	●
N		●	●			●
S		●	●			●
H		○				

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTS200M2P02PT	2	2,00	0,15	19,10	4116129	4116130	-	-	-
WMTS094I2BP02PT	2B	2,38	0,15	22,15	4118451	4118452	-	-	-
WMTS094I2BP04PT	2B	2,38	0,38	22,14	4118583	4118584	-	-	-
WMTS300M3P03PT	3	3,00	0,31	25,65	4113563	4113564	-	-	4113566
WMTS300M3P06PT	3	3,00	0,61	25,65	4113565	4113567	-	-	-
WMTS125I3P03PT	3	3,17	0,23	25,40	4118585	4118586	-	-	-
WMTS125I3P08PT	3	3,17	0,76	25,40	4118587	4118588	-	-	-
WMTS400M4P03PT	4	4,00	0,31	25,40	4113572	4113574	-	-	4113573
WMTS400M4P06PT	4	4,00	0,60	25,40	4113575	4113576	-	-	-
WMTS188I5P03PT	5	4,76	0,26	28,63	4118589	4118590	-	-	-
WMTS188I5P08PT	5	4,77	0,76	28,63	4118591	4118592	-	-	-
WMTS500M5P03PT	5	5,00	0,30	28,63	4116143	4116144	-	-	4116145

WMT Grooving Inserts • PT Precision Ground

(continued)



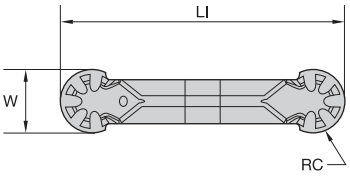
● first choice
○ alternate choice

P	○	○	●	●	
M	●	●			○
K	○	○	●	●	●
N	●	●			●
S	●	●			●
H	○				

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTS500M5P06PT	5	5,00	0,61	28,63	4116146	4116147	-	-	-
WMTS600M6P03PT	6	6,00	0,30	28,63	4117239	4117240	-	-	-
WMTS600M6P06PT	6	6,00	0,58	28,63	4117241	4117242	-	-	-
WMTS250I6P08PT	6	6,34	0,76	28,63	4118595	4118596	-	-	-
WMTS250I6P03PT	6	6,35	0,25	28,63	4118593	4118594	-	-	-
WMTS800M8P06PT	8	8,00	0,61	28,57	-	4117258	-	-	-
WMTS800M8P15PT	8	8,00	1,50	28,57	4117259	4117260	-	-	-

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Grooving Inserts • PC Full Radius Precision Molded



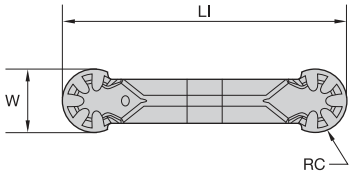
● first choice
○ alternate choice

P		○	○	●	●	
M		●	●			○
K		○	○	●	●	●
N		●	●			●
S		●	●			●
H		○				

catalogue number	SSC	W	RC	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTR305M3UPC	3	3,13	1,53	25,53	4170172	4170173	4170174	-	-
WMTR405M4UPC	4	4,13	2,03	25,58	4170177	4170178	4170179	-	-
WMTR505M5UPC	5	5,13	2,53	29,01	4170182	4170183	4170184	-	-
WMTR605M6UPC	6	6,12	3,03	28,77	4170187	4170188	4170189	-	-
WMTR805M8UPC	8	8,13	4,03	29,22	4170192	4170193	4170194	-	-

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Grooving Inserts • PC Full Radius Precision Ground



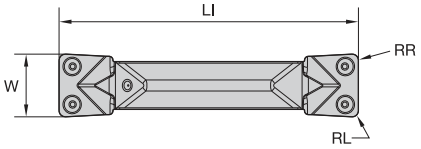
● first choice
○ alternate choice

P		○	○	●	●	
M		●	●			○
K		○	○	●	●	●
N		●	●			●
S		●	●			●
H		○				

catalogue number	SSC	W	RC	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTR300M3PPC	3	3,00	1,50	25,40	4170170	4170171	-	-	4170195
WMTR400M4PPC	4	4,00	2,00	25,45	4170175	4170176	-	-	4170196
WMTR188I5PPC	5	4,78	2,39	28,65	4170119	4170120	-	-	-
WMTR500M5PPC	5	5,00	2,50	28,88	4170180	4170181	-	-	-
WMTR600M6PPC	6	6,00	3,00	28,65	4170185	4170186	-	-	-
WMTR250I6PPC	6	6,36	3,18	29,01	4170121	4170122	-	-	-
WMTR312I8PPC	8	7,94	3,96	29,00	4170163	4170164	-	-	-
WMTR800M8PPC	8	8,00	4,00	29,08	4170190	4170191	-	-	-

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Grooving Inserts • PH Precision Molded



RR = RL

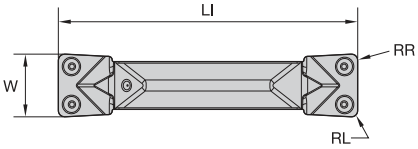
● first choice
○ alternate choice

P		○	○	●	●	
M		●	●			○
K		○	○	●	●	●
N		●	●			●
S		●	●			●
H		○				

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTS305M3U03PH	3	3,13	0,30	25,81	5346392	5346393	'	'	'
WMTS305M3U06PH	3	3,13	0,60	25,81	5346394	5346395	'	'	'
WMTS405M4U03PH	4	4,13	0,30	25,53	5346396	5346397	'	'	'
WMTS405M4U06PH	4	4,13	0,60	25,53	5346398	5346399	'	'	'
WMTS505M5U03PH	5	5,13	0,30	28,76	5346400	5346401	'	'	'
WMTS505M5U06PH	5	5,13	0,60	28,76	5346402	5346403	'	'	'
WMTS605M6U03PH	6	6,13	0,30	28,76	5346404	5346405	'	'	'
WMTS605M6U06PH	6	6,13	0,60	28,76	5346406	5346407	'	'	'
WMTS805M8U03PH	8	8,13	0,30	28,70	5346410	5346411	'	'	'
WMTS805M8U06PH	8	8,13	0,60	28,70	5346408	5346409	'	'	'

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Grooving Inserts • PH Precision Ground



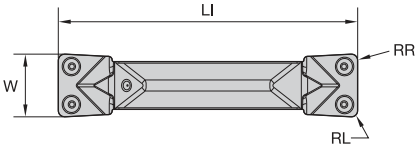
● first choice
○ alternate choice

P	○	○	●	●	
M	●	●			○
K	○	○	●	●	●
N	●	●			●
S	●	●			●
H	○				

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTS300M3P03PH	3	3,00	0,30	25,65	5346412	5346413	-	-	5346414
WMTS300M3P06PH	3	3,00	0,60	25,65	5346415	5346416	-	-	5346417
WMTS125I3P03PH	3	3,18	0,25	25,40	5345914	5291300	-	-	-
WMTS125I3P08PH	3	3,18	0,75	25,40	5345915	5331093	-	-	-
WMTS156I4P03PH	4	3,95	0,30	25,40	5345916	5345917	-	-	-
WMTS156I4P08PH	4	3,96	0,75	25,40	5345918	5345919	-	-	-
WMTS400M4P03PH	4	4,00	0,30	25,40	5346418	5346419	-	-	5346420
WMTS400M4P06PH	4	4,00	0,60	25,40	5346421	5346422	-	-	5346423
WMTS188I5P03PH	5	4,77	0,25	28,63	5345980	5331095	-	-	-
WMTS188I5P08PH	5	4,77	0,75	28,63	5345981	5331097	-	-	-
WMTS500M5P03PH	5	5,00	0,30	28,63	-	5346425	-	-	5346426
WMTS500M5P06PH	5	5,00	0,60	28,63	5346427	5346428	-	-	5346429

WMT Grooving Inserts • PH Precision Ground

(continued)



● first choice
○ alternate choice

P	○	○	●	●	
M	●	●			○
K	○	○	●	●	●
N	●	●			●
S	●	●			●
H	○				

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WP10CT	WP25CT	WU10HT
WMTS600M6P03PH	6	6,00	0,30	28,63	5346430	5346431	-	-	-
WMTS600M6P06PH	6	6,00	0,60	28,63	5346432	5346433	-	-	-
WMTS250I6P08PH	6	6,32	0,75	28,63	5345984	5327621	-	-	-
WMTS250I6P03PH	6	6,35	0,25	28,63	5345983	5327620	-	-	-
WMTS312I8P03PH	8	7,92	0,25	28,57	5345985	5345986	-	-	-
WMTS312I8P08PH	8	7,92	0,75	28,57	5345987	5345988	-	-	-
WMTS800M8P03PH	8	8,00	0,30	28,57	-	5346437	-	-	-
WMTS800M8P06PH	8	8,00	0,60	28,57	-	5346435	-	-	-

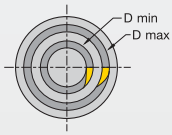
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

Catalog Numbering System

Our WMT Toolholders now have a smart new naming system.
Here are some examples of the improved nomenclature for our WMT Toolholders.

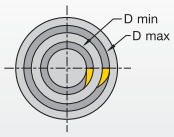
Integral Toolholders

WMT	B	R	2525	M	3	13	—	038-052
Tooling System	Tool Style	Hand	Shank Size	Tool Length	Seat Size	Max Grooving Depth		Face Grooving Diameter
WMT = Groove and Turn (WMT Insert)	**S** = Straight **C** = Straight with circular support **E** = End mount **A** = Straight, face grooving curve in **B** = Straight, face grooving curve out	**R** = Right hand **L** = Left hand	Height x Width in mm	**H** = 100 **J** = 110 **K** = 125 **L** = 140 **M** = 150 **P** = 170	**1** **2** **2B** **3** **4** **5** **6** **8**	CD max in mm	D min – D max in mm (e.g., 70–100 = 70mm D min 100 mm D max)	Diameters are min and max for outer face groove diameter 999 = unlimited D max



Modular Blades

WMT	WGM	R	3	16	B	070-100
Tooling System	Connection Type	Hand	Seat Size	Max Grooving Depth	Tool Style	Face Grooving Diameter
		R = Right hand **L** = Left hand			**A** = Curve In **B** = Curve Out	



Catalog Numbering System

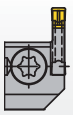
Our WMT Toolholders now have a smart new naming system.
Here are some examples of the improved nomenclature for our WMT Toolholders.

Modular Toolholders

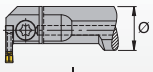
WGM	S	R	2525
Tooling System	Tool Style	Hand	Shank Size
MDG = Modular Deep Grooving **WGM** = Modular Serrated Locking System	**S** = Straight **E** = End mount	**R** = Right hand **L** = Left hand	

Integral Boring Bars

A — Steel Bar with Coolant

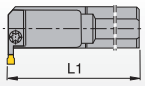


25 — Bar Diameter



metric bars:	inch bars:
Bar diameter in millimeters	A two-digit number which indicates the bar diameter in 1/16" increments.

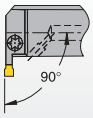
R — Bar Length



metric bars:	inch bars:
R = 200mm	R = 8"
S = 250mm	S = 10"
T = 300mm	T = 12"

WMT — WMT Groove & Turn System

E — Tool Style



E = End mounted (90º)

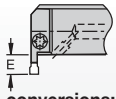
R — Hand

R = Right hand
L = Left hand

03 — Seat Size

pocket seat size	cutting width (mm)
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05

16 — Max Grooving Depth



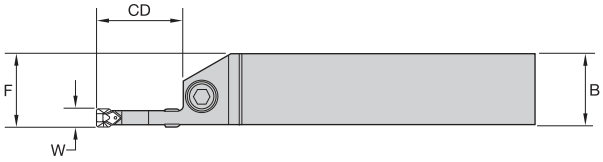
conversions:

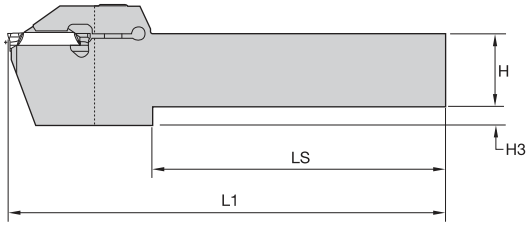
mm	inch
7mm	.28"
10mm	.39"
12mm	.47"
16mm	.63"

M — Tool Units

N = Inch
M = Metric

WMT Integral Toolholders • Metric



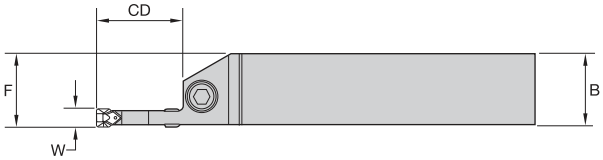


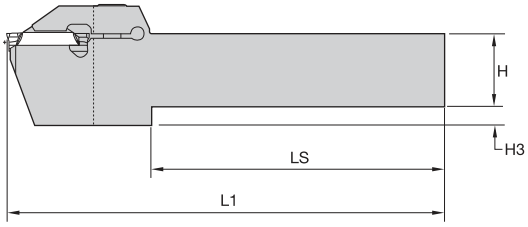
Right Hand Tool

order number	catalogue number	SSC	W	H	B	CD	F	H3	L1	LS
right hand										
3650516	WMTSR2525M116	1	1,50	25,0	25,0	17	25,0	—	150	116
3539162	WMTCR1212H213	2	2,00	12,0	12,0	—	12,0	—	100	74
5964677	WMTCR1212H216	2	2,00	12,0	12,0	—	12,0	—	100	70
3650456	WMTSR1616K216	2	2,00	16,0	16,0	17	16,0	6	125	93
3650458	WMTSR2020K216	2	2,00	20,0	20,0	17	20,0	—	125	93
3650506	WMTSR2525M216	2	2,00	25,0	25,0	17	25,0	—	150	118
3539172	WMTSR1616K2B19	2B	2,38	16,0	16,0	24	15,9	5	125	88
3539174	WMTSR2020K2B19	2B	2,38	20,0	20,0	24	19,9	5	125	88
3539221	WMTCR2525M2B19	2B	2,38	25,0	25,4	24	24,9	—	150	113
3650460	WMTSR1616K311	3	3,00	16,0	16,0	11	16,0	—	125	93
3650462	WMTSR1616K322	3	3,00	16,0	16,0	22	16,0	5	125	85
3650468	WMTSR2020K311	3	3,00	20,0	20,0	11	20,0	—	125	93
3650470	WMTSR2020K322	3	3,00	20,0	20,0	22	20,0	5	125	85
3650479	WMTSR2525M311	3	3,00	25,0	25,0	11	25,0	—	150	118
3650481	WMTSR2525M322	3	3,00	25,0	25,0	22	25,0	—	150	110
3650502	WMTSR1616K411	4	4,00	16,0	16,0	11	16,0	—	125	92
3650464	WMTSR1616K422	4	4,00	16,0	16,0	22	16,0	5	125	83
3653751	WMTSR2020K22	4	4,00	20,0	20,0	22	20,0	5	125	83
3650504	WMTSR2020K411	4	4,00	20,0	20,0	11	20,0	—	125	92
3653752	WMTSR2525M411	4	4,00	25,0	25,0	11	25,0	—	150	117
3650483	WMTSR2525M422	4	4,00	25,0	25,0	22	25,0	—	150	109
3650473	WMTSR2020K514	5	5,00	20,0	20,0	14	20,0	—	125	88
3650475	WMTSR2020L525	5	5,00	20,0	20,0	25	20,0	5	140	93
3650485	WMTSR2525M514	5	5,00	25,0	25,0	14	25,0	—	150	115
3650487	WMTSR2525M525	5	5,00	25,0	25,0	25	25,0	—	150	104
3650477	WMTSR2020L614	6	6,00	20,0	20,0	14	20,0	—	140	103
3650489	WMTSR2525M614	6	6,00	25,0	25,0	14	25,0	—	150	113
3650491	WMTSR2525M625	6	6,00	25,0	25,0	25	25,0	—	150	104
3650494	WMTSR2525M814	8	8,00	25,0	25,0	14	25,0	—	150	113
3650496	WMTSR2525M825	8	8,00	25,0	25,0	25	25,0	—	150	104
3650498	WMTSR3232M814	8	8,00	32,0	32,0	14	32,0	—	150	113
3650500	WMTSR3232M825	8	8,00	32,0	32,0	25	32,0	—	150	104
left hand										
3653332	WMTSL2525M116	1	1,50	25,0	25,0	17	25,0	—	150	116
3539163	WMTCL1212H213	2	2,00	12,0	12,0	—	12,0	—	100	74
3650457	WMTSL1616K216	2	2,00	16,0	16,0	17	16,0	6	125	93
3650459	WMTSL2020K216	2	2,00	20,0	20,0	17	20,0	—	125	93
3650507	WMTSL2525M216	2	2,00	25,0	25,0	17	25,0	—	150	118
3539173	WMTSL1616K2B19	2B	2,38	16,0	16,0	24	15,9	5	125	88
3539175	WMTSL2020K2B19	2B	2,38	20,0	20,0	24	19,9	5	125	88
3650461	WMTSL1616K311	3	3,00	16,0	16,0	11	16,0	—	125	93
3650463	WMTSL1616K322	3	3,00	16,0	16,0	22	16,0	5	125	85
3650469	WMTSL2020K311	3	3,00	20,0	20,0	11	20,0	—	125	93
3650471	WMTSL2020K322	3	3,00	20,0	20,0	22	20,0	5	125	85
3650480	WMTSL2525M311	3	3,00	25,0	25,0	11	25,0	—	150	118
3650482	WMTSL2525M322	3	3,00	25,0	25,0	22	25,0	—	150	110
3650465	WMTSL1616K422	4	4,00	16,0	16,0	22	16,0	5	125	83
3650472	WMTSL2020K22	4	4,00	20,0	20,0	22	20,0	5	125	83
3650505	WMTSL2020K411	4	4,00	20,0	20,0	11	20,0	—	125	92
3653763	WMTSL2525M411	4	4,00	25,0	25,0	11	25,0	—	150	117
3650484	WMTSL2525M422	4	4,00	25,0	25,0	22	25,0	—	150	109

WMT Integral Toolholders • Metric

(continued)



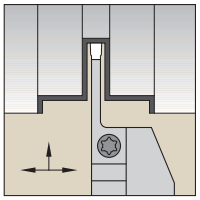


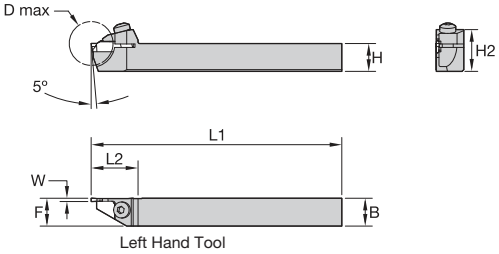
Right Hand Tool

order number	catalogue number	SSC	W	H	B	CD	F	H3	L1	LS
3650467	**WMTSL1616K514**	5	5,00	16,0	16,0	14	16,0	—	125	88
3650474	**WMTSL2020K514**	5	5,00	20,0	20,0	14	20,0	—	125	88
3650486	**WMTSL2525M514**	5	5,00	25,0	25,0	14	25,0	—	150	113
3650488	**WMTSL2525M525**	5	5,00	25,0	25,0	25	25,0	—	150	104
3650490	**WMTSL2525M614**	6	6,00	25,0	25,0	14	25,0	—	150	114
3650493	**WMTSL2525M625**	6	6,00	25,0	25,0	25	25,0	—	150	104
3650495	**WMTSL2525M814**	8	8,00	25,0	25,0	14	25,0	—	150	113
3650497	**WMTSL2525M825**	8	8,00	25,0	25,0	25	25,0	—	150	104
3650499	**WMTSL3232M814**	8	8,00	32,0	32,0	14	32,0	—	150	113
3650501	**WMTSL3232M825**	8	8,00	32,0	32,0	25	32,0	—	150	104

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Integral Toolholders for Swiss-Style Machines • Metric

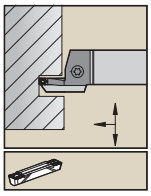


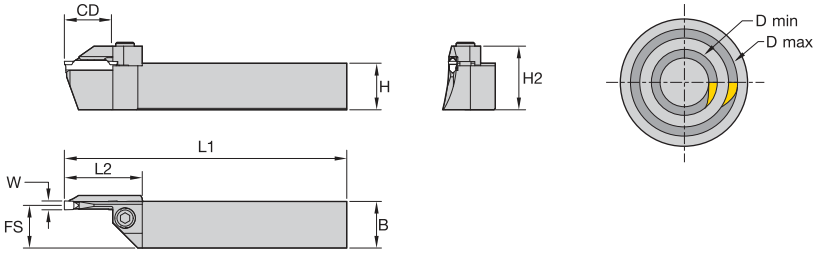


order number	catalogue number	SSC	W	H	B	F	D max	H2	L1	L2
right hand										
3650508	**WMTCR1010H110**	1	1,50	10,0	10,0	10,0	20	16	100	21
3650510	**WMTCR1212H110**	1	1,50	12,0	12,0	12,0	20	18	100	21
3650512	**WMTCR1616K113**	1	1,50	16,0	15,9	16,0	26	24	125	24
3650514	**WMTCR2020K113**	1	1,50	20,0	19,9	20,0	26	28	125	24
3653413	**WMTCR1010H210**	2	2,00	10,0	10,0	10,0	20	16	100	21
3653415	**WMTCR1212H210**	2	2,00	12,0	12,0	12,0	20	18	100	21
3653417	**WMTCR1616K213**	2	2,00	16,0	15,8	16,0	26	24	125	24
3653419	**WMTCR2020K213**	2	2,00	20,0	19,8	20,0	26	28	125	24
3539170	**WMTCR1212H2B16**	2B	2,38	12,0	11,7	11,9	32	23	100	30
left hand										
3650509	**WMTCL1010H110**	1	1,50	10,0	10,0	10,0	20	16	100	21
3650511	**WMTCL1212H110**	1	1,50	12,0	12,0	12,0	20	18	100	21
3650513	**WMTCL1616K113**	1	1,50	16,0	15,9	16,0	26	24	125	24
3650515	**WMTCL2020K113**	1	1,50	20,0	19,9	20,0	26	28	125	24
3653414	**WMTCL1010H210**	2	2,00	10,0	10,0	10,0	20	16	100	21
3653416	**WMTCL1212H210**	2	2,00	12,0	12,0	12,0	20	18	100	21
3653418	**WMTCL1616K213**	2	2,00	16,0	15,8	16,0	26	24	125	24
3653420	**WMTCL2020K213**	2	2,00	20,0	19,8	20,0	26	28	125	24
3539171	**WMTCL1212H2B16**	2B	2,38	12,0	11,7	11,9	32	23	100	30

NOTE: Insert exterior edge in line with toolholder edge for 10mm and 12mm shank toolholders.
SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

WMT Integral Toolholders for Face Grooving • Curve Out • Metric





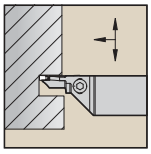
Left Hand Tool

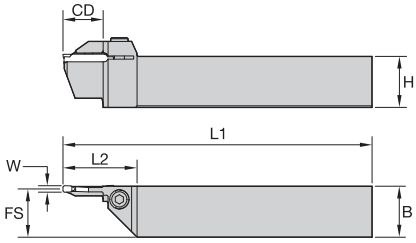
order number	catalogue number	SSC	W	H	B	FS	CD	D max	D min	H2	L1	L2
right hand												
3653421	**WMTBR2525M313-038-052**	3	3,00	25,0	25,0	23,5	13	52	38	32	150	34
3653423	**WMTBR2525M316-052-070**	3	3,00	25,0	25,0	23,5	16	70	52	32	150	34
3653425	**WMTBR2525M316-070-100**	3	3,00	25,0	25,0	23,5	16	100	70	32	150	34
3653427	**WMTBR2525M319-100-205**	3	3,00	25,0	25,0	23,5	19	205	100	32	150	37
3653764	**WMTBR2525M412-032-052**	4	4,00	25,0	25,0	23,0	13	52	32	32	150	34
3653766	**WMTBR2525M415-052-070**	4	4,00	25,0	25,0	23,0	16	70	52	32	150	34
3653768	**WMTBR2525M415-070-100**	4	4,00	25,0	25,0	23,0	16	100	70	32	150	34
3653770	**WMTBR2525M418-100-205**	4	4,00	25,0	25,0	23,0	19	205	100	32	150	37
3653433	**WMTBR2525M519-070-100**	5	5,00	25,0	25,0	22,5	19	100	70	34	150	42
3653435	**WMTBR2525M525-100-205**	5	5,00	25,0	25,0	22,5	25	205	100	34	150	42
left hand												
3653422	**WMTBL2525M313-038-052**	3	3,00	25,0	25,0	23,5	13	52	38	32	150	34
3653424	**WMTBL2525M316-052-070**	3	3,00	25,0	25,0	23,5	16	70	52	32	150	34
3653426	**WMTBL2525M316-070-100**	3	3,00	25,0	25,0	23,5	16	100	70	32	150	34
3653428	**WMTBL2525M319-100-205**	3	3,00	25,0	25,0	23,5	19	205	100	32	150	37
3653771	**WMTBL2525M418-100-205**	4	4,00	24,8	24,8	23,0	19	205	100	32	150	37
3653436	**WMTBL2525M525-100-205**	5	5,00	24,8	24,8	22,5	25	205	100	34	150	42
3653444	**WMTBL2525M625-100-205**	6	6,00	24,8	24,8	22,0	25	205	100	34	150	42

NOTE: Insert cutting edge for WMT Face Grooving system is positioned +0,75mm above center.
The WMT Face Grooving system is not designed to cut diameters of less than 12,6mm.
Toolholders that accept 3mm width inserts have an integral clamp.
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.
SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

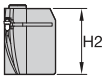
Blade Style	Part Shape	Left Hand	Right Hand
Curve Out			

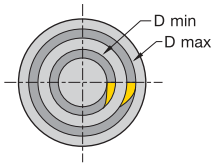
WMT Integral Toolholders for Face Grooving • Curve In • Metric





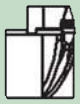
Left Hand Tool



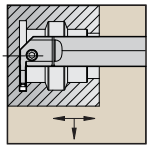


order number	catalogue number	SSC	W	H	B	FS	CD	D max	D min	H2	L1	L2
right hand												
3634282	**WMTAR2525M316-070-100**	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34
3634284	**WMTAR2525M319-100-205**	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37
3634290	**WMTAR2525M619-070-100**	6	6,00	24,8	24,8	22,0	19	100	70	34	150	42
left hand												
3634285	**WMTAL2525M319-100-205**	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37
3634287	**WMTAL2525M519-070-100**	5	5,00	24,8	24,8	22,5	19	100	70	34	150	42

NOTE: Insert cutting edge for WMT Face Grooving system is positioned +0,75mm above center.
The WMT Face Grooving system is not designed to cut diameters of less than 12,6mm.
Toolholders that accept 3mm width inserts have an integral clamp.
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.
SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

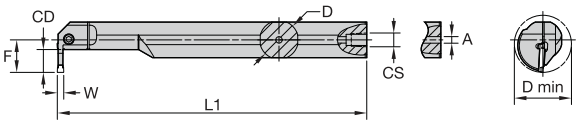
Blade Style	Part Shape	Left Hand	Right Hand
Curve In			

WMT Integral I.D. Grooving Boring Bars • Metric



Steel shank with through coolant.

Right Hand Tool

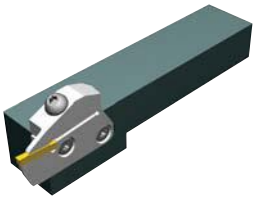


Right Hand Tool

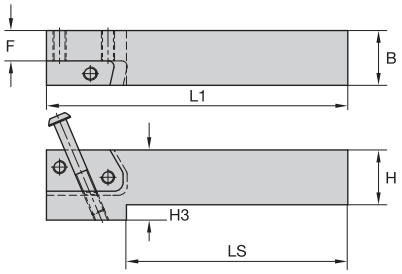
order number	catalogue number	SSC	W	F	CD	D	D min	L1	A	CS
right hand										
5423874	**A25RWMTER0316M**	3	3,00	26,0	16	25,00	41	200	6,40	1/4-18 NPT
5423875	**A32SWMTER0319M**	3	3,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423876	**A25RWMTER0416M**	4	4,00	26,0	16	25,00	41	200	6,40	1/4-18 NPT
5423877	**A32SWMTER0419M**	4	4,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423878	**A32SWMTER0519M**	5	5,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423879	**A40TWMTER0522M**	5	5,00	32,0	22	40,00	54	300	6,40	1/4-18 NPT
5423880	**A32SWMTER0619M**	6	6,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423881	**A40TWMTER0622M**	6	6,00	31,8	22	40,00	54	300	6,40	1/4-18 NPT
left hand										
5423882	**A25RWMTEL0316M**	3	3,00	26,0	16	25,00	41	200	6,40	1/4-18 NPT
5423883	**A32SWMTEL0319M**	3	3,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423884	**A25RWMTEL0416M**	4	4,00	26,0	16	25,00	41	200	6,40	1/4-18 NPT
5423885	**A32SWMTEL0419M**	4	4,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423886	**A32SWMTEL0519M**	5	5,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423887	**A40TWMTEL0522M**	5	5,00	32,0	22	40,00	54	300	6,40	1/4-18 NPT
5423888	**A32SWMTEL0619M**	6	6,00	29,0	19	32,00	47	250	6,40	1/4-18 NPT
5423889	**A40TWMTEL0622M**	6	6,00	31,8	22	40,00	54	300	6,40	1/4-18 NPT

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

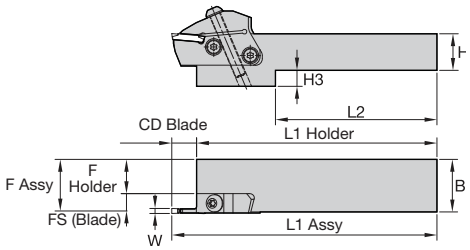
WMT Modular Toolholders • Straight Mount • Grooving, Cut-Off, Face Grooving • Metric



Right Hand Tool
2 blade screws required



Right Hand Tool
2 blade screws required

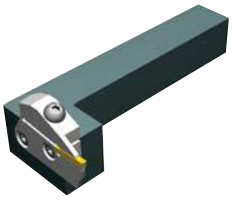


F Assy = F (Holder) + FS (Blade) + W/2
L1 Assy = L1 (Holder) + CD (Blade)

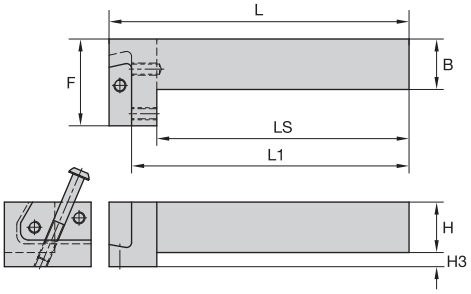
order number	catalogue number	H	B	L1	LS	F	H3
right hand							
5349628	**WGMSR2020**	20	20	108,0	68,00	8,84	12
5349629	**WGMSR2525**	25	25	126,0	95,78	13,84	7
5349641	**WGMSR3232**	32	32	126,0	69,85	20,81	—
left hand							
5349627	**WGMSL2525**	25	25	126,0	95,78	13,84	7

NOTE: Use the larger seat size toolholder for optimal performance.

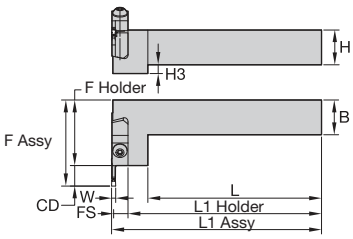
WMT Modular Toolholders • End Mount • Grooving, Cut-Off, Face Grooving • Metric



Right Hand Tool



Right Hand Tool



F Assy = F (Holder) + CD (Blade)
L1 Assy = L1 (Holder) + FS (Blade) + W/2

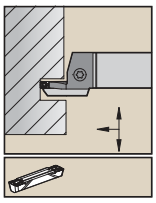
order number	catalogue number	H	B	L	L1	LS	F	H3
right hand								
5514979	**WGMER2525**	25	25	150,3	139,3	125,25	42,75	9
left hand								
5514978	**WGMEL2525**	25	25	150,3	139,3	125,25	42,75	9

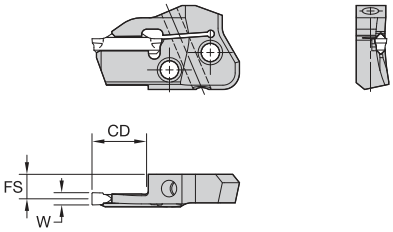
Toolholder Style	Hand of Holder	Hand of Blade
WGMS — Straight Mount	Right	Right
	Left	Left
WGME — End Mount	Right	Left
	Left	Right

Grooving and Cut-Off Blades found on page E38

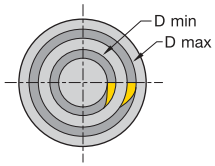
Face Grooving Blades found on page E39

WMT • Face Grooving • Metric





Right Hand Tool

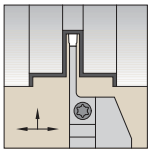


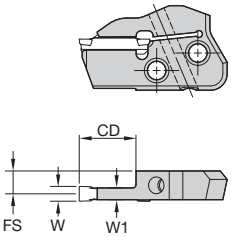
order number	catalogue number	SSC	D min	D max	CD	W	FS
right hand							
5359150	**WMTWGMR313B038-052**	3	38,00	52,00	12,70	3,00	11,00
5359151	**WMTWGMR316B052-070**	3	52,00	70,00	15,88	3,00	11,00
5359152	**WMTWGMR316B070-100**	3	70,00	100,00	15,88	3,00	11,00
5359153	**WMTWGMR319B100-205**	3	100,00	205,00	19,05	3,00	11,00
5359154	**WMTWGMR416B052-070**	4	52,00	70,00	15,88	4,00	10,50
5359155	**WMTWGMR416B070-100**	4	70,00	100,00	15,88	4,00	10,50
5359156	**WMTWGMR419B100-205**	4	100,00	205,00	19,05	4,00	10,50
5359157	**WMTWGMR522B100-205**	5	100,00	205,00	22,00	5,00	10,00
5359158	**WMTWGMR622B100-205**	6	100,00	205,00	22,00	6,00	10,00
left hand							
5359134	**WMTWGML313B038-052**	3	38,00	52,00	12,70	3,00	11,00
5359135	**WMTWGML316B052-070**	3	52,00	70,00	15,88	3,00	11,00
5359136	**WMTWGML316B070-100**	3	70,00	100,00	15,88	3,00	11,00
5359137	**WMTWGML319100-205**	3	100,00	205,00	19,05	3,00	11,00
5359138	**WMTWGML413B038-052**	4	38,00	52,00	12,70	4,00	10,50
5359139	**WMTWGML416B052-070**	4	52,00	70,00	15,88	4,00	10,50
5359141	**WMTWGML419B100-205**	4	100,00	205,00	19,05	4,00	10,50
5359142	**WMTWGML516B038-052**	5	38,00	52,00	15,88	5,00	10,00
5359143	**WMTWGML519B052-070**	5	52,00	70,00	19,05	5,00	10,00
5359144	**WMTWGML519B070-100**	5	70,00	100,00	19,05	5,00	10,00
5359145	**WMTWGML522B100-205**	5	100,00	205,00	22,00	5,00	10,00
5359147	**WMTWGML619B052-070**	6	52,00	70,00	19,05	6,00	10,00
5359148	**WMTWGML619B070-100**	6	70,00	100,00	19,05	6,00	10,00
5359149	**WMTWGML622B100-205**	6	100,00	205,00	22,00	6,00	10,00

NOTE: Blade and clamp screw torque equals 8–10 Nm.

Toolholder Style	Hand of Holder	Hand of Blade
WGMS — Straight Mount	Right	Right
	Left	Left
WGME — End Mount	Right	Left
	Left	Right

WMT Grooving and Cut-Off • Metric





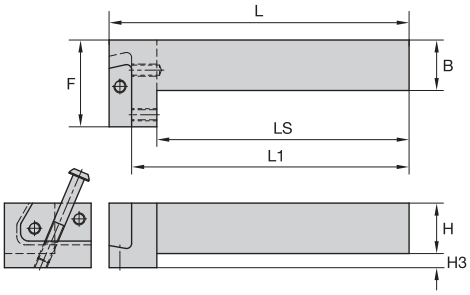
Right Hand Blade

order number	catalogue number	SSC	CD	W	FS	W1
right hand						
5359127	**WMTWGMR114S**	1	14,00	1,50	11,04	1,22
5359128	**WMTWGMR213S**	2	13,00	2,00	10,81	1,68
5359129	**WMTWGMR2B16S**	2B	16,50	2,39	10,71	1,88
5359130	**WMTWGMR319S**	3	19,00	3,00	10,38	2,54
5359131	**WMTWGMR419S**	4	19,00	4,00	10,00	3,30
5359132	**WMTWGMR522S**	5	22,00	5,00	9,82	3,66
5359133	**WMTWGMR622S**	6	22,00	6,00	9,26	4,78
left hand						
5359121	**WMTWGML213S**	2	13,00	2,00	10,81	1,68
5359122	**WMTWGML2B16S**	2B	16,50	2,39	10,71	1,88
5359123	**WMTWGML319S**	3	19,00	3,00	10,38	2,54
5359124	**WMTWGML419S**	4	19,00	4,00	10,00	3,30
5359125	**WMTWGML522S**	5	22,00	5,00	9,82	3,66
5359126	**WMTWGML622S**	6	22,00	6,00	9,26	4,78

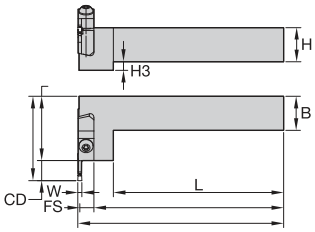
NOTE: Blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.).
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Toolholder Style	Hand of Holder	Hand of Blade
WGMS — Straight Mount	Right	Right
	Left	Left
WGME — End Mount	Right	Left
	Left	Right

WMT Modular Toolholders • End Mount • Grooving, Cut-Off, Face Grooving • Inch



Right Hand Tool



F Assy
F Holder
L1 Holder
L1 Assy

order number	catalogue number	H	B	L	L1	LS	F	H3
right hand								
5514977	**WGMER16**	1.00	1.00	5.96	5.53	4.96	1.70	.24
5515022	**WGMER2050**	1.25	1.25	5.96	5.53	4.96	1.70	—
left hand								
5514976	**WGMEL16**	1.00	1.00	5.96	5.53	4.96	1.70	.24
5515023	**WGMEL2050**	1.25	1.25	5.96	5.53	4.96	1.70	—

TopGroove™

TopGroove for Shallow Grooving and Face Grooving

The WIDIA™ TopGroove clamping system is perfect for shallow grooving operations and features an extensive carbide grade selection to meet the most demanding application requirements. With maximum clamping rigidity and superior versatility, TopGroove inserts employ a unique top rake chip control geometry that efficiently evacuates chips and produces better quality parts.

- TopGroove clamping design features a rugged bridge clamp, which locates in a groove molded into the insert, to provide superior resistance to side and radial cutting forces.
- TopGroove inserts are available for shallow grooving, deep grooving, light turning, profiling, shallow and deep face grooving, back turning, undercutting, and Poly-Vee grooving.
- The proprietary WIDIA chip control design works in multidirectional turning as well as radial feed applications to provide excellent chip evacuation in deep grooving applications.

RIGID

Inserts feature a top rake chip control geometry for maximum clamping rigidity.

VERSATILE

The TopGroove clamping system provides a complete line of grooving geometries and an extensive grade selection to meet even the most demanding application requirements.

SHALLOW GROOVING CLAMPING SYSTEM

INSERTS

INSERT STYLE	APPLICATION	RAKE ANGLE
NG	• General-purpose grooving. • O-ring grooving. • Circlip grooving.	Neutral
NG-K	• Chip control geometry. • General-purpose grooving. • O-ring grooving. • Circlip grooving. • Light turning.	10° positive
NGC-K*	• Combined groove and chamfered edge break in one positive plunge with chip control. • Designed for DIN 471/472 standard circlip grooves.	10° positive
NGD*	• Deep grooving.	Neutral
NGD-K	• Chip control geometry. • Deep grooving. • Light turning.	10° positive
NGP	• General-purpose grooving. • O-ring grooving. • Circlip grooving.	5° positive
NF*	• Face grooving. • Additional side clearance.	Neutral
NF-K	• Face grooving with chip control. • Additional side clearance.	10° positive
NFD-K	• Deep face grooving with chip control. • Additional side clearance.	10° positive

INSERT STYLE	APPLICATION	RAKE ANGLE
NFD-KI*	• Internal deep face grooving with chip control. • For use in boring bars for internal face grooves.	10° positive
NP-K	• Turning. • Back turning positive. • Profiling with chip control.	10° positive
NR	• Full radius grooving. • Turning and profiling.	Neutral
NR-K	• Chip control geometry. • Full radius grooving, turning, and profiling.	10° positive
NRD	• Deep grooving. • Full radius end-form.	Neutral
NRP*	• Full radius grooving. • Light-turning profiling.	5° positive
NU*	• Undercutting.	Neutral
NV*	• Poly-Vee grooving.	Neutral
NB/NBD	• Blanks. • Blanks for deep grooving. • Available in uncoated grades only.	—

Inserts are available as custom solutions.

INDUSTRY

GENERAL ENGINEERING

TRANSPORTATION

APPLICATIONS

FACE GROOVING

GROOVING

I.D. GROOVING

Choosing the Correct TopGroove Cutter

The Most Advanced Turning Solutions in the Industry

Perfect for shallow grooving operations, the WIDIA™ TopGroove clamping system provides a complete line of grooving geometries and an extensive grade selection to meet even the most demanding application requirements. For increased rigidity, versatility, chip control, and carbide grade options, the TopGroove clamping system is the proven solution.

With maximum clamping rigidity and superior versatility, TopGroove inserts employ a unique top rake chip control geometry that efficiently evacuates chips and produces better quality parts, faster than ever before.

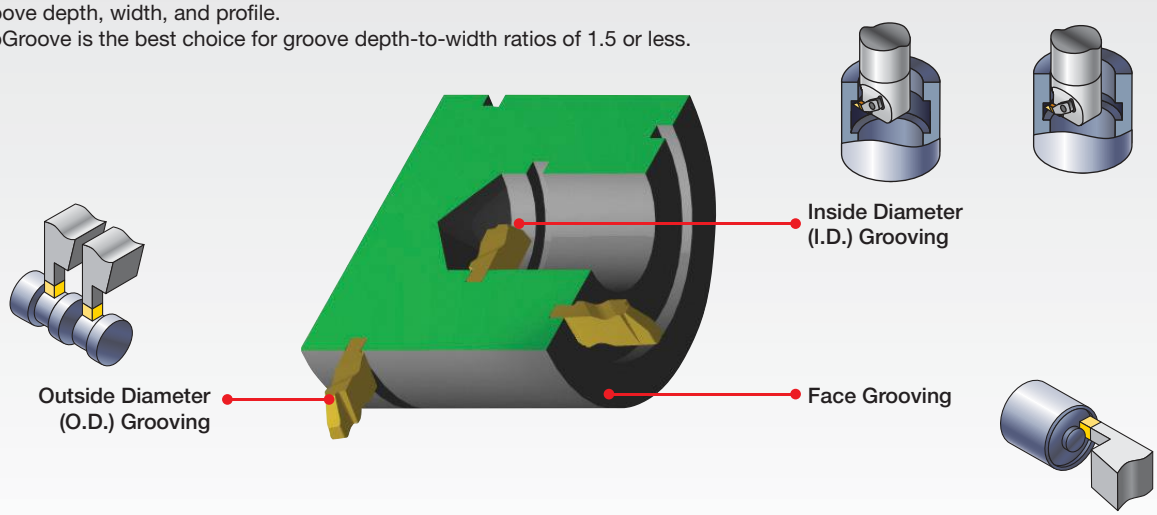
Use this comprehensive, easy-to-use guide for the information necessary to identify, choose, and select the appropriate cutting tools for your specific needs.

What you need to know:

- Material being machined.
- Groove depth, width, and profile.
- Application to be performed (face, O.D., or I.D. grooving).
- Toolholder requirements (e.g., KM™, ERICKSON™, square shank, right/left).

1 Choose the application to be performed:

Groove depth, width, and profile.
TopGroove is the best choice for groove depth-to-width ratios of 1.5 or less.



For deep grooving, use WMT™ on page E340–E373.

TopGroove for Internal, External, and Face Grooving Applications

system capabilities			minimum	maximum
	O.D./I.D. Grooving	width	0,50mm	9,53mm
		depth	–	12,7mm
	Face Grooving	width	3,2mm	6,35mm
		depth	–	12,7mm
	Internal Grooving	diameter	11,2mm	–
	Face Grooving Diameter	standard	23,9mm	–
		deep	–	–
	Deep O.D./I.D. Grooving	width	1,50mm	6,35mm
		depth	–	12,7mm
	Deep Face Grooving	width	3,18mm	6,35mm
		depth	–	12,7mm

Choosing the Correct TopGroove Cutter

2 Identify the material to be machined:

Each tool has a material grid marked with a letter indicating the materials that can be machined.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

3 Select your toolholder based on the application:

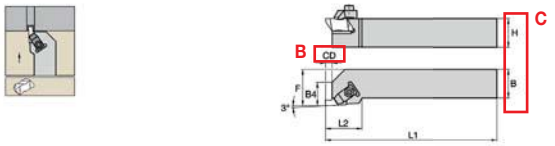
A Choose the appropriate gage insert (width) required for the application.

B Choose the shortest cutting depth "CD" dimension for increased tool rigidity.

C Select the largest toolholder shank "H" and "B" dimensions for maximum rigidity.

Grooving and Cut-Off • TopGroove™

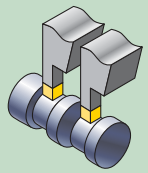
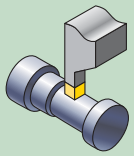
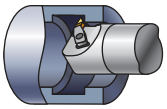
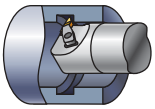
Integral Toolholders • NS • Metric



order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert
right hand									
3641660	NSR1212F2	12,0	12,0	16,0	80	19	9	4	N.2R
3636542	NSR1616H2	16,0	16,0	20,0	100	19	9	4	N.2R
3638589	NSR2020K2	20,0	20,0	25,0	125	19	9	4	N.2R
3638588	NSR2020K3	20,0	20,0	25,0	125	32	13	5	N.3R
3638590	NSR2525M2	25,0	25,0	32,0	150	19	9	4	N.2R
3636536	NSR2525M3	25,0	25,0	32,0	150	32	13	5	N.3R
3636540	NSR2525M4	25,0	25,0	32,0	150	35	14	7	N.4R
3641666	NSR3232P3	32,0	32,0	40,0	170	32	13	5	N.3R
3641669	NSR3232P4	32,0	32,0	40,0	170	35	14	7	N.4R
left hand									
3639045	NSL2020K2	20,0	20,0	25,0	125	19	9	4	N.2L
3639046	NSL2020K3	20,0	20,0	32,0	125	32	13	5	N.3L
3639047	NSL2525M2	25,0	25,0	32,0	150	19	9	4	N.2L
3636539	NSL2525M3	25,0	25,0	32,0	150	32	13	5	N.3L
3636544	NSL2525M4	25,0	25,0	32,0	150	35	14	7	N.4L

NOTE: F dimension measured over sharp point of insert.

C B A

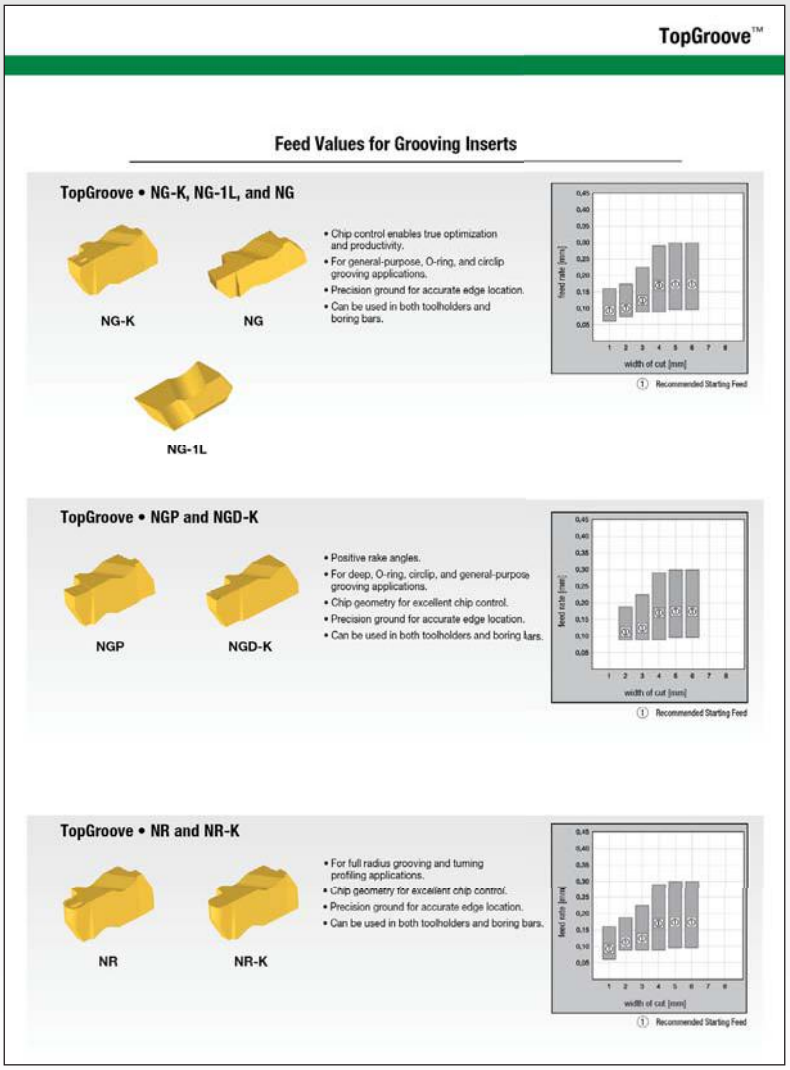
		application	conventional toolholders	modular blades
		O.D. Grooving and Plunge and Turn	E364–E366	E372
		I.D. Grooving	E369	—

Choosing the Correct TopGroove Cutter

4 Select chipbreaker style for the application:

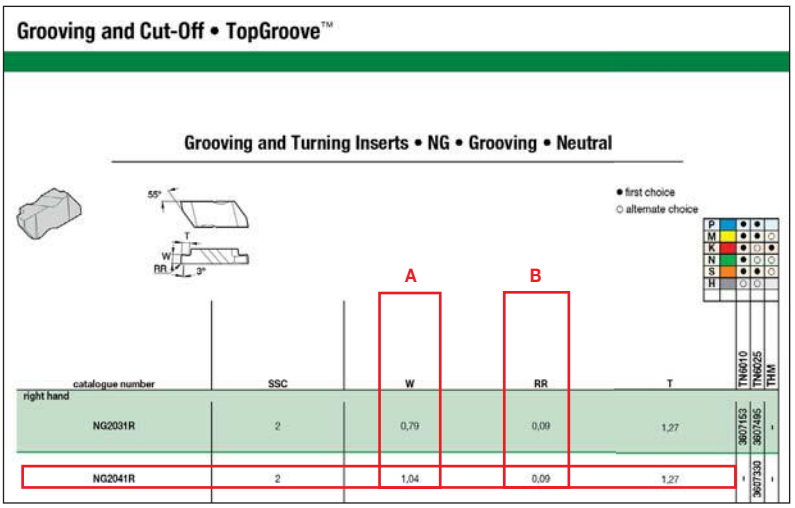
See application guide on page E382 for a complete list of insert styles.

NOTE: Chart shows recommended starting feed rates.



A Choose the appropriate insert width "W" for your specific application.

B Select the required corner radius value "RR".



Choosing the Correct TopGroove Cutter

5 Select grade:

cutting condition		Recommended Grades					
		steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
smooth cut, pre-turned surface		TN7110	TN6010	TN7110	TN6010/THM	TN6010	TN6010
varying depth of cut, casting, or forging skin		TN6010	TN6010	TN6010	TN6010/THM	TN6010	TN6010
lightly interrupted cut		TN6025	TN6025	TN6025	TN6010/THM	TN6010	TN6025
heavily interrupted cut		TN6025	TN6025	TN6025	TN6010/THM	TN6010	TN6025

See page E347 for Grades and Grade Descriptions.

6 Determine cutting data:

A Based on material group and grade, identify starting speed (vc).

B First choice starting speed is in bold.

See page E384 for cutting data.

TopGroove™

Recommended Cutting Speeds • Metric

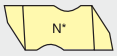
Material Group		Cutting Speed – vc m/min								
		TN6010			TN6025			THM		
		min	Start	max	min	Start	max	min	Start	max
P	0/1	140	175	210	130	140	150	90	95	100
	2	115	145	175	110	145	175	75	100	125
	3	115	145	175	110	145	175	75	100	125
	4	75	100	120	75	95	115	55	65	80
	5	105	140	170	100	125	145	70	85	100
	6	45	60	75	40	55	65	30	40	45
M	1	90	115	140	60	75	90	60	75	90
	2	55	70	90	40	50	55	50	60	75
	3	60	80	95	40	50	60	40	50	55
K	1	120	150	180	60	80	90	70	90	100
	2	120	150	180	60	75	85	50	65	80
	3	110	140	170	60	75	90	60	70	80
N	1	600	750	900	600	750	900	600	750	900
	2	535	685	835	535	685	835	500	650	800
	3	230	300	370	230	300	370	600	750	900
	4	135	180	225	135	180	225	500	650	800
	5	70	90	110	70	90	110	230	300	370
	6	445	565	690	445	565	690	150	200	250
	7	550	700	850	550	700	850	150	200	250
S	1	35	40	50	25	35	40	25	35	45
	2	20	20	30	15	20	20	20	30	35
	3	60	70	80	40	60	70	15	25	30
	4	30	35	45	20	30	35	10	15	20
H	1	15	30	60	15	30	60	10	20	35
	2	15	30	60	15	30	60	10	20	35
	3	15	30	60	15	30	60	10	20	35
	4	15	30	60	15	30	60	10	20	35

Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

N — Type of Insert

N — TopGroove



G — Insert Style

B — Blank (for special forms)

F — Face grooving

G — Grooving

P — Back turning

R — Full radius

U — Undercutting (or relieving)

V — Poly-Vee

D — Additional Information

D — Deep grooving

P — Positive

C — Groove and chamfer

2 — Insert Size

insert number	W1 mm
1	2,54
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73

M — Size Identification

M — Metric insert groove width

C — Circlip groove insert width is nominal circlip size

Blank — Indicates inch width insert

150 — Groove Size**

Position pertains to groove width for F-, G-, and U-style inserts, radii for R-style grooving inserts, and circlip size for groove and chamfer inserts. Dimension in 0,01mm.

Metric example: 3,25mm width groove or radius equals "325" catalog position number.

Width Tolerance: ±0,025mm unless otherwise specified.

R — Hand of Insert

L — Left hand

R — Right hand

Cutting Depth

Shown for groove and chamfer inserts in 0,01mm increments.

K — Chipbreaker Design

K — Standard chip control

E — Hone only

Definition of Inserts

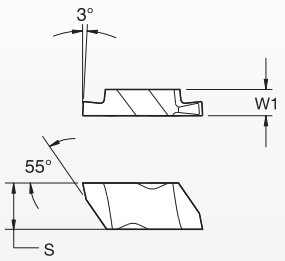
Groove size

J or L — Poly-Vee inserts

I — Internal face grooving

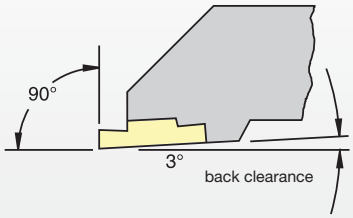
***Omit position for TopGroove NB-style blanks.*

TopGroove/TopThread Threading and Grooving Insert Dimensions



	S		W1	
insert size	mm	inch	mm	Inch
1	2,54	.100	2,54	.100
2	5,56	.219	3,81	.150
3	8,74	.344	4,95	.195
4	11,51	.453	6,48	.255
5	17,48	.688	9,65	.380
6	11,51	.453	9,73	.383
8	7,93	.312	11,13	.438

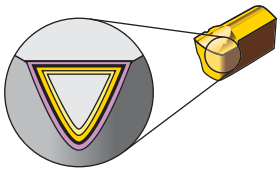
TopGroove/TopThread Holder Design



NOTE: Holders are designed to locate insert inclined to 3° to provide back clearance down open side.

WIDIA™ TopGroove and TopThread™ tooling technology combine to bring you the very best threading and grooving system available in the world today.

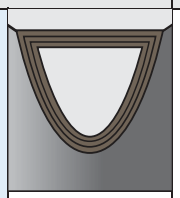
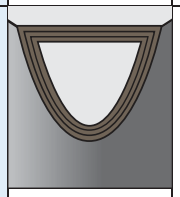
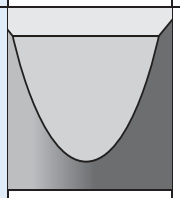
Grades and Grade Descriptions



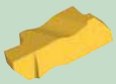
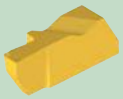
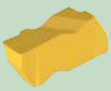
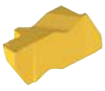
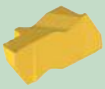
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

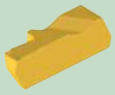
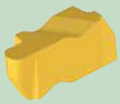
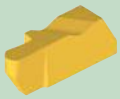
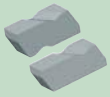
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
TN6010	 HC-S10	An advanced PVD TiAlN coating over a very deformation-resistant unalloyed carbide substrate. TN6010 is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P									
			M									
			K									
			N									
			S									
			H									
TN6025	 HC-S25	An advanced PVD TiAlN-coated grade with a tough, ultra-fine-grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P									
			M									
			K									
			N									
			S									
			H									
THM	 HW-K15	Uncoated carbide. Extraordinarily good balance of hardness, wear resistance, edge stability, and toughness. Light and medium machining. For cast iron and all non-ferrous metals and non-metals. Useful in unfavorable conditions.	P									
			M									
			K									
			N									
			S									
			H									

Application Guide

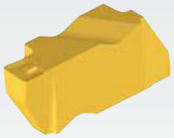
insert style	application	rake angle	page(s)
NG 	• General-purpose grooving. • O-ring grooving. • Circlip grooving.	neutral	E386–E388
NG-K	• Chip control geometry. • General-purpose grooving. • O-ring grooving. • Circlip grooving. • Light turning.	10° positive	E389–E397
NGC-K*	• Combined groove and chamfered edge break in one positive plunge with chip control. • Designed for DIN 471/472 standard circlip grooves.	10° positive	–
NGD*	• Deep grooving.	neutral	–
NGD-K 	• Chip control geometry. • Deep grooving. • Light turning.	10° positive	E398–E400
NGP	• General-purpose grooving. • O-ring grooving. • Circlip grooving.	5° positive	E401
NF* 	• Face grooving. • Additional side clearance.	neutral	–
NF-K 	• Face grooving with chip control. • Additional side clearance.	10° positive	E402
NFD-K 	• Deep face grooving with chip control. • Additional side clearance.	10° positive	E403

insert style	application	rake angle	page(s)
NFD-KI* 	• Internal deep face grooving with chip control. • For use in boring bars for internal face grooves.	10° positive	–
NP-K	• Turning. • Back turning positive. • Profiling with chip control.	10° positive	E404
NR 	• Full radius grooving. • Turning and profiling.	neutral	E405–E408
NR-K	• Chip control geometry. • Full radius grooving, turning, and profiling.	10° positive	E409
NRD 	• Deep grooving. • Full radius end-form.	neutral	E410
NRP*	• Full radius grooving. • Light-turning profiling.	5° positive	–
NU*	• Undercutting.	neutral	–
NV*	• Poly-Vee grooving.	neutral	–
NB/NBD 	• Blanks. • Blanks for deep grooving. • Available in uncoated grades only.	–	E385

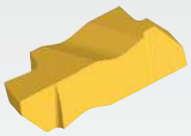
Inserts are available as custom solutions.

Feed Values for Grooving Inserts

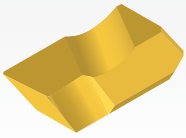
TopGroove • NG-K, NG-1L, and NG



NG-K

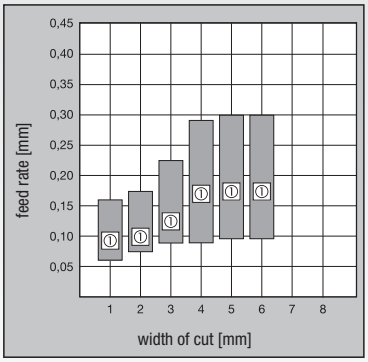


NG



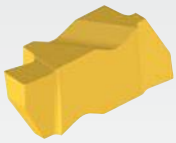
NG-1L

- Chip control enables true optimization and productivity.
- For general-purpose, O-ring, and circlip grooving applications.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.

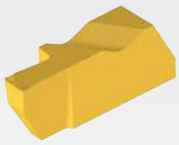


① Recommended Starting Feed

TopGroove • NGP and NGD-K

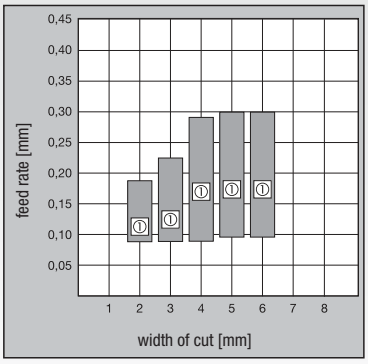


NGP



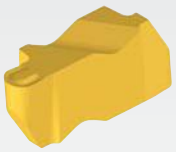
NGD-K

- Positive rake angles.
- For deep, O-ring, circlip, and general-purpose grooving applications.
- Chip geometry for excellent chip control.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.

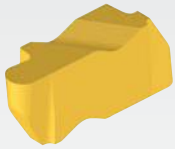


① Recommended Starting Feed

TopGroove • NR and NR-K

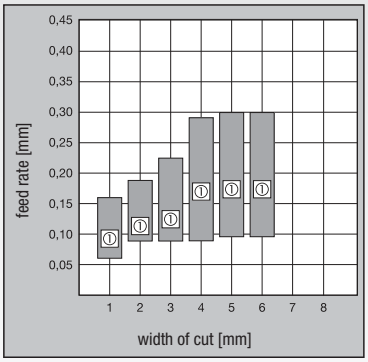


NR



NR-K

- For full radius grooving and turning profiling applications.
- Chip geometry for excellent chip control.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.

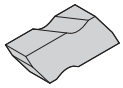


① Recommended Starting Feed

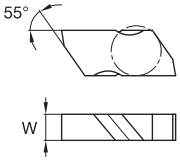
Recommended Cutting Speeds • Metric

Material Group		Cutting Speed — vc m/min								
		TN6010			TN6025			THM		
		min	Start	max	min	Start	max	min	Start	max
P	0/1	140	**175**	210	130	**140**	150	90	**95**	100
	2	115	**145**	175	110	**145**	175	75	**100**	125
	3	115	**145**	175	110	**145**	175	75	**100**	125
	4	75	**100**	120	75	**95**	115	55	**65**	80
	5	105	**140**	170	100	**125**	145	70	**85**	100
	6	45	**60**	75	40	**55**	65	30	**40**	45
M	1	90	**115**	140	60	**75**	90	60	**75**	90
	2	55	**70**	90	40	**50**	55	50	**60**	75
	3	60	**80**	95	40	**50**	60	40	**50**	55
K	1	120	**150**	180	60	**80**	90	70	**90**	100
	2	120	**150**	180	60	**75**	85	50	**65**	80
	3	110	**140**	170	60	**75**	90	60	**70**	80
N	1	600	**750**	900	600	**750**	900	600	**750**	900
	2	535	**685**	835	535	**685**	835	500	**650**	800
	3	230	**300**	370	230	**300**	370	600	**750**	900
	4	135	**180**	225	135	**180**	225	500	**650**	800
	5	70	**90**	110	70	**90**	110	230	**300**	370
	6	445	**565**	690	445	**565**	690	150	**200**	250
	7	550	**700**	850	550	**700**	850	150	**200**	250
S	1	35	**40**	50	25	**35**	40	25	**35**	45
	2	20	**20**	30	15	**20**	20	20	**30**	35
	3	60	**70**	80	40	**60**	70	15	**25**	30
	4	30	**35**	45	20	**30**	35	10	**15**	20
H	1	15	**30**	60	15	**30**	60	10	**20**	35
	2	15	**30**	60	15	**30**	60	10	**20**	35
	3	15	**30**	60	15	**30**	60	10	**20**	35
	4	15	**30**	60	15	**30**	60	10	**20**	35

Grooving and Turning Inserts • NB • Blanks



Right-hand insert shown; left-hand insert is mirror image.

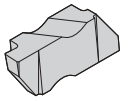


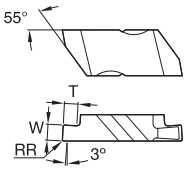
● first choice
○ alternate choice

P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	TN6010	TN6025	THM
right hand					
NB2R	2	3,84	-	-	3607064
left hand					
NB2L	2	3,84	-	-	3607016
NB3L	3	4,95	-	-	3607017

Grooving and Turning Inserts • NG • Grooving • Neutral





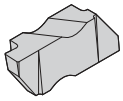
● first choice
○ alternate choice

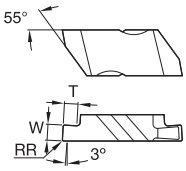
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	RR	T	TN6010	TN6025	THM
right hand							
NG2031R	2	0,79	0,09	1,27	3607153	3607495	-
NG2041R	2	1,04	0,09	1,27	-	3607330	-
NG2058R	2	1,47	0,19	1,27	-	3607450	-
NG2062R	2	1,58	0,19	2,79	3607167	3607453	-
NG3047R	3	1,19	0,19	1,91	3607157	3607416	-
NG3062R	3	1,58	0,19	2,39	3607109	3607403	3607014
NG3094R	3	2,39	0,19	3,81	3607137	3607406	3607018
NG3125R	3	3,18	0,19	3,81	3607110	3607375	3607020
NG4250R	4	6,35	0,57	6,35	-	3607382	-
left hand							
NG2031L	2	0,79	0,09	1,27	-	3607482	-
NG2058L	2	1,47	0,19	1,27	-	3607498	-
NG2062L	2	1,58	0,19	2,79	-	3607481	-
NG3047L	3	1,19	0,19	1,91	3607179	3607501	-
NG3062L	3	1,57	0,19	2,38	3607158	3607459	-

Grooving and Turning Inserts • NG • Grooving • Neutral

(continued)





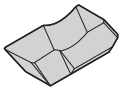
● first choice
○ alternate choice

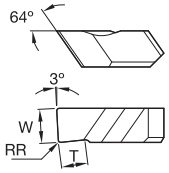
P		●	●	
M		●	●	○
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○	

catalogue number	SSC	W	RR	T	TN6010	TN6025	THM
NG3094L	3	2,39	0,19	3,81	3607160	3607323	-
NG3125L	3	3,18	0,19	3,81	3607152	3607445	-
NG4250L	4	6,35	0,57	6,35	-	3607513	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NG-1L • Grooving





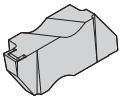
● first choice
○ alternate choice

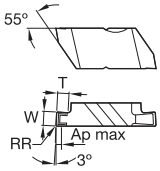
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	RR	T	cutting edges	TN6010	TN6025	THM
left hand								
NG1047L	1	1,19	0,19	1,91	1	-	3636571	-
NG1062L	1	1,58	0,19	1,91	1	-	3636569	-
NG1094L	1	2,39	0,19	1,91	1	-	3636570	-

NOTE: SSC = To correspond with the SSC on the toolholder.
Width tolerance is +/– .003" (+/- 0,076mm) on NG-1L inserts.

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker





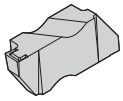
● first choice
○ alternate choice

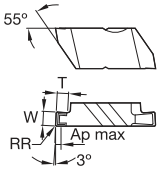
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
right hand								
NG2M050RK	2	0,50	0,64	0,09	0,64	3606991	3607394	-
NG2031RK	2	0,79	0,76	0,09	1,27	3607090	3607313	-
NG2M080RK	2	0,80	0,76	0,09	1,27	3606903	3607291	-
NG2M100RK	2	1,00	0,76	0,09	1,28	3607129	3607218	-
NG2M120RK	2	1,20	0,76	0,09	1,27	3606679	3607299	-
NG2047RK	2	1,19	0,76	0,09	1,27	3607123	3607404	-
NG2M140RK	2	1,40	0,76	0,09	1,28	3607151	3607318	-
NG2M150RK	2	1,50	1,09	0,19	2,81	-	3607234	-
NG2062RK	2	1,56	1,09	0,19	2,79	3607089	3607215	-
NG2M170RK	2	1,70	1,09	0,19	2,81	-	3607242	-
NG2M175RK	2	1,75	1,09	0,19	2,81	-	3607379	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





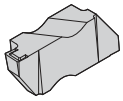
● first choice
○ alternate choice

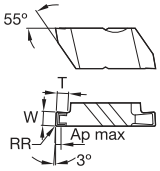
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG2M195RK	2	1,95	1,09	0,19	2,81	3606829	3607417	-
NG2M200RK	2	2,00	1,09	0,19	2,81	3607100	3607071	-
NG2M220RK	2	2,20	1,09	0,19	2,81	-	3607521	-
NG2M225RK	2	2,25	1,09	0,19	2,81	3606828	3607411	-
NG2094RK	2	2,39	1,09	0,19	2,79	3607146	3607317	-
NG2M250RK	2	2,50	1,09	0,19	2,81	-	3607324	-
NG2M275RK	2	2,75	1,09	0,19	2,81	3606916	3607409	-
NG2M300RK	2	3,00	1,09	0,19	2,81	3606676	3607340	-
NG2125RK	2	3,18	1,09	0,19	2,79	3607155	3607381	-
NG2M325RK	2	3,25	1,09	0,19	2,79	-	3607533	-
NG3M100RK	3	1,00	0,76	0,20	1,91	-	3607219	-
NG3M120RK	3	1,20	0,76	0,19	1,91	-	3607412	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





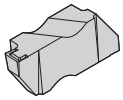
● first choice
○ alternate choice

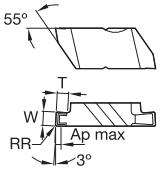
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG3047RK	3	1,19	0,76	0,19	1,91	3607084	3607238	-
NG3M150RK	3	1,50	1,02	0,19	2,39	-	3607221	-
NG3062RK	3	1,57	1,02	0,19	2,39	3607055	3607070	-
NG3M175RK	3	1,75	1,02	0,19	2,39	-	3607418	-
NG3072RK	3	1,83	1,02	0,19	2,39	-	3607332	-
NG3078RK	3	1,98	1,02	0,19	2,39	3607111	3607309	-
NG3M200RK	3	2,00	1,02	0,19	2,39	-	3607208	-
NG3M220RK	3	2,20	1,02	0,19	2,39	-	3607336	-
NG3M225RK	3	2,24	1,02	0,19	2,39	3606674	3607310	-
NG3094RK	3	2,39	1,02	0,19	3,81	3606660	3607069	-
NG3M250RK	3	2,50	1,02	0,19	3,81	-	3607217	-
NG3M275RK	3	2,75	1,02	0,19	3,81	3606677	3607337	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





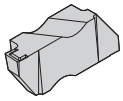
● first choice
○ alternate choice

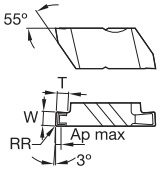
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG3M300RK	3	3,00	1,02	0,19	3,81	3607138	3607072	-
NG3125RK	3	3,18	1,02	0,19	3,81	3607057	3607068	-
NG3M320RK	3	3,20	1,02	0,19	3,81	-	3607365	-
NG3M350RK	3	3,50	2,92	0,32	3,81	-	3607302	-
NG3156RK	3	3,96	2,92	0,19	3,81	3607127	3607456	-
NG3M400RK	3	4,00	2,92	0,32	3,81	3606678	3607235	-
NG3M425RK	3	4,25	2,92	0,32	3,81	3606914	-	-
NG3M450RK	3	4,50	2,92	0,32	3,81	-	3607362	-
NG3189RK	3	4,80	2,92	0,57	3,81	3607108	3607305	-
NG4M300RK	4	3,00	1,02	0,19	3,81	-	3607388	-
NG4125RK	4	3,18	1,06	0,19	3,81	3607163	3607449	-
NG4M350RK	4	3,50	2,92	0,57	6,35	-	3607370	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





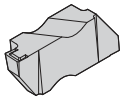
● first choice
○ alternate choice

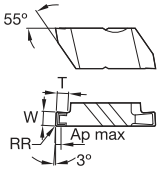
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG4M400RK	4	4,00	2,92	0,57	6,35	3606908	-	-
NG4M450RK	4	4,50	2,92	0,57	6,35	-	3607390	-
NG4189RK	4	4,80	2,92	0,57	6,35	3607103	3607220	-
NG4M550RK	4	5,50	3,81	0,58	6,35	-	3607383	-
NG4250RK	4	6,35	3,81	0,57	6,35	-	3607304	-
left hand								
NG2M050LK	2	0,50	0,64	0,09	0,64	-	3607463	-
NG2031LK	2	0,79	0,76	0,09	1,27	3607112	3607443	-
NG2M080LK	2	0,80	0,76	0,09	1,27	3606911	3607534	-
NG2M100LK	2	1,00	0,76	0,09	1,27	-	3607239	-
NG2M120LK	2	1,20	0,76	0,09	1,27	3606827	3607334	-
NG2047LK	2	1,19	0,76	0,09	1,27	-	3607376	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





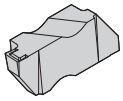
● first choice
○ alternate choice

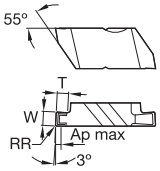
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG2M140LK	2	1,40	0,76	0,09	1,27	3606904	3607338	-
NG2M150LK	2	1,50	1,09	0,19	2,79	-	3607294	-
NG2062LK	2	1,58	1,09	0,19	2,79	3607126	3607307	-
NG2M170LK	2	1,70	1,09	0,19	2,79	3606905	3607327	-
NG2M175LK	2	1,75	1,09	0,19	2,79	-	3607421	-
NG2M195LK	2	1,95	1,09	0,19	2,79	-	3607420	-
NG2M200LK	2	2,00	1,09	0,19	2,79	3607144	3607207	-
NG2M220LK	2	2,20	1,09	0,19	2,79	-	3607367	-
NG2M225LK	2	2,25	1,09	0,19	2,79	-	3607413	-
NG2094LK	2	2,39	1,09	0,19	2,79	3607149	3607380	-
NG2M250LK	2	2,50	1,09	0,19	2,79	-	3607518	-
NG2M275LK	2	2,75	1,09	0,19	2,80	-	3607292	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





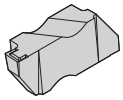
● first choice
○ alternate choice

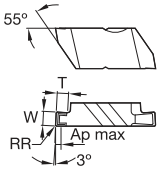
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG2M300LK	2	3,00	1,09	0,19	2,80	-	3607326	-
NG2125LK	2	3,18	1,09	0,19	2,79	3607165	3607444	-
NG2M325LK	2	3,25	1,09	0,19	2,79	-	3607368	-
NG3M100LK	3	1,00	0,76	0,20	1,91	-	3607419	-
NG3M120LK	3	1,20	0,76	0,19	1,91	-	3607384	-
NG3047LK	3	1,19	0,76	0,19	1,90	3607105	3607374	-
NG3M150LK	3	1,50	1,02	0,19	2,39	-	3607308	-
NG3062LK	3	1,58	1,02	0,19	2,39	3607092	3607213	-
NG3M175LK	3	1,75	1,02	0,19	2,39	-	3607331	-
NG3072LK	3	1,83	1,02	0,19	2,39	-	3607454	-
NG3078LK	3	1,98	1,02	0,19	2,39	3607106	3607460	-
NG3M200LK	3	2,00	1,02	0,19	2,39	-	3607211	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





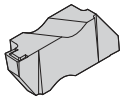
● first choice
○ alternate choice

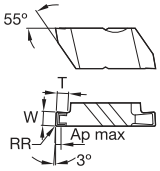
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG3M220LK	3	2,20	1,02	0,19	2,39	-	3607516	-
NG3M225LK	3	2,25	1,02	0,19	2,39	-	3607329	-
NG3094LK	3	2,39	1,02	0,19	3,81	3607058	3607204	-
NG3M250LK	3	2,50	1,02	0,19	3,81	-	3607300	-
NG3M275LK	3	2,75	1,02	0,19	3,81	-	3607297	-
NG3M300LK	3	3,00	1,02	0,19	3,81	3606522	3607212	-
NG3125LK	3	3,18	1,02	0,19	3,81	3607061	3607203	-
NG3M320LK	3	3,20	1,02	0,19	3,81	-	3607372	-
NG3M325LK	3	3,25	1,02	0,19	3,81	-	3607315	-
NG3M350LK	3	3,50	2,92	0,32	3,81	-	3607519	-
NG3156LK	3	3,96	2,92	0,19	3,81	3607177	3607335	-
NG3M400LK	3	4,00	2,92	0,32	3,81	3606906	3607237	-

Grooving and Turning Inserts • NG-K • Grooving with Chip Breaker

(continued)





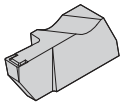
● first choice
○ alternate choice

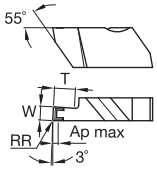
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
NG3M450LK	3	4,50	2,92	0,32	3,81	-	3607369	-
NG3189LK	3	4,80	2,92	0,57	3,81	3607107	3607320	-
NG4125LK	4	3,18	1,06	0,19	3,81	-	3607448	-
NG4M400LK	4	4,00	2,92	0,57	6,35	-	3607363	-
NG4189LK	4	4,80	2,92	0,57	6,35	3607140	3607377	-
NG4M600LK	4	6,00	3,81	0,57	6,34	-	3607387	-
NG4250LK	4	6,35	3,81	0,57	6,35	-	3607311	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NGD-K • Deep Grooving with Chip Breaker





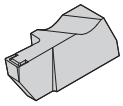
● first choice
○ alternate choice

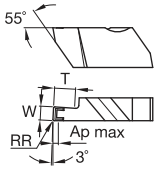
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	cutting edges	TN6010	TN6025	THM
right hand									
NGD2M150RK	2	1,50	1,09	0,19	4,06	1	-	3607503	-
NGD2M200RK	2	2,00	1,09	0,19	5,08	1	3606938	3607465	-
NGD2M250RK	2	2,50	1,09	0,19	5,08	1	-	3607504	-
NGD3062RK	3	1,58	1,02	0,19	3,18	2	3607104	3607233	-
NGD3M200RK	3	2,00	1,02	0,19	4,06	1	3606945	3607505	-
NGD3094RK	3	2,39	1,02	0,19	6,35	1	3607083	3607205	3607029
NGD3M250RK	3	2,50	1,02	0,19	6,35	1	3606946	3607425	-
NGD3M300RK	3	3,00	1,02	0,19	6,35	1	3606922	3607426	-
NGD3125RK	3	3,18	1,02	0,19	6,35	1	3607088	3607210	-
NGD3M350RK	3	3,50	2,92	0,32	6,35	1	-	3607506	-
NGD3M400RK	3	4,00	2,92	0,32	6,35	1	-	3607427	-

Grooving and Turning Inserts • NGD-K • Deep Grooving with Chip Breaker

(continued)





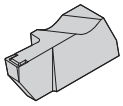
● first choice
○ alternate choice

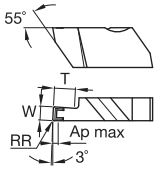
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	cutting edges	TN6010	TN6025	THM
NGD3189RK	3	4,80	2,92	0,58	6,35	1	3607170	3607373	-
NGD4125RK	4	3,18	1,02	0,19	6,35	2	3607133	3607312	-
NGD4M400RK	4	4,00	2,92	0,57	9,53	1	-	3607507	-
NGD4M450RK	4	4,50	2,92	0,57	12,70	1	-	3607508	-
NGD4189RK	4	4,80	2,92	0,57	9,53	1	3607161	3607321	-
NGD4M500RK	4	5,00	2,92	0,57	12,70	1	3606988	-	-
NGD4250RK	4	6,35	3,81	0,57	12,70	1	3607134	3607414	-
left hand									
NGD2M150LK	2	1,50	1,09	0,19	4,06	1	3606935	3607402	-
NGD2M200LK	2	2,00	1,09	0,19	5,08	1	3606936	3607399	-
NGD2M250LK	2	2,50	1,09	0,19	5,08	1	3606992	3607391	-
NGD3062LK	3	1,57	1,02	0,19	3,18	2	3607098	3607451	-

Grooving and Turning Inserts • NGD-K • Deep Grooving with Chip Breaker

(continued)





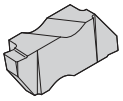
● first choice
○ alternate choice

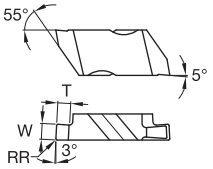
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	cutting edges	TN6010	TN6025	THM
NGD3M200LK	3	2,00	1,02	0,19	4,06	1	3606941	3607487	-
NGD3094LK	3	2,39	1,02	0,19	6,34	1	3607096	3607240	3607035
NGD3M250LK	3	2,50	1,02	0,19	6,35	1	3606942	3607423	-
NGD3M300LK	3	3,00	1,02	0,19	6,35	1	3606943	3607400	-
NGD3125LK	3	3,18	1,02	0,19	6,35	1	3607097	3607209	-
NGD3M350LK	3	3,50	2,92	0,32	6,35	1	-	3607488	-
NGD3M400LK	3	4,00	2,92	0,32	6,35	1	-	3607424	-
NGD3189LK	3	4,80	2,92	0,57	6,35	1	3607148	3607410	-
NGD4125LK	4	3,18	1,02	0,19	6,35	2	-	3607316	-
NGD4M400LK	4	4,00	2,92	0,58	9,52	1	-	3607489	-
NGD4M450LK	4	4,50	2,92	0,57	12,70	1	-	3607490	-
NGD4189LK	4	4,80	2,92	0,57	9,53	1	3607147	3607314	-
NGD4M500LK	4	5,00	2,92	0,58	12,70	1	-	3607491	-
NGD4250LK	4	6,35	3,80	0,57	12,70	1	-	3607422	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NGP • Grooving • Positive





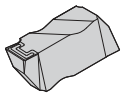
● first choice
○ alternate choice

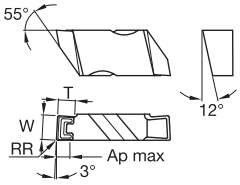
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	RR	T	TN6010	TN6025	THM
right hand							
NGP2M150R	2	1,50	0,19	2,79	-	-	3607045
NGP2062R	2	1,58	0,19	2,79	3607128	-	-
NGP2M200R	2	2,00	0,19	2,79	-	-	3607046
NGP2M300R	2	3,00	0,19	2,79	3606978	-	-
NGP3M150R	3	1,50	0,19	1,90	3606979	-	-
left hand							
NGP2062L	2	1,57	0,19	2,79	3607182	-	-
NGP2M200L	2	2,00	0,19	2,79	3606968	-	-
NGP3M250L	3	2,50	0,19	3,81	3606973	-	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NF-K • Face Grooving with Chip Breaker





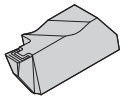
● first choice
○ alternate choice

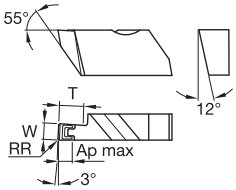
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RR	T	TN6010	TN6025	THM
right hand								
NF3M200RK	3	2,00	1,02	0,19	1,78	-	3607511	-
NF3M300RK	3	3,00	1,02	0,19	3,81	-	3607512	-
NF3125RK	3	3,18	1,02	0,19	3,81	-	3607241	-
left hand								
NF3M200LK	3	2,00	1,02	0,19	1,78	-	3607428	-
NF3M300LK	3	3,00	1,02	0,19	3,81	-	3607429	-
NF3125LK	3	3,18	1,02	0,19	3,81	-	3607322	-
NF3156LK	3	3,96	2,92	0,19	3,81	-	3607333	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NFD-K • Deep Face Grooving with Chip Breaker





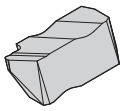
● first choice
○ alternate choice

P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

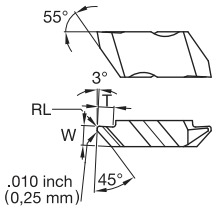
catalogue number	SSC	W	Ap max	RR	T	cutting edges	TN6010	TN6025	THM
right hand									
NFD3M300RK	3	3,00	1,02	0,19	6,35	1	-	3607523	-
NFD3125RK	3	3,18	1,02	0,19	6,35	1	-	3607296	-
NFD4189RK	4	4,80	2,92	0,57	9,53	1	-	3607325	-
left hand									
NFD3M300LK	3	3,00	1,02	0,19	6,35	1	-	3607464	-
NFD3125LK	3	3,18	1,02	0,19	6,35	1	-	3607293	-
NFD4189LK	4	4,80	2,92	0,57	9,53	1	-	3607415	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NP-K • Profiling with Chip Control



Right-hand insert shown; left-hand insert is mirror image.

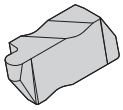


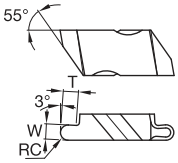
● first choice
○ alternate choice

P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RL	T	TN6010	TN6025	THM
right hand								
NP2002RK	2	3,73	2,75	0,09	2,81	3607136	3607477	-
NP3002RK	3	4,88	3,84	0,09	5,08	3607154	3607493	-
NP3012RK	3	4,90	3,86	0,34	5,08	-	3607328	-

Grooving and Turning Inserts • NR • Full Radius





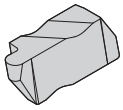
● first choice
○ alternate choice

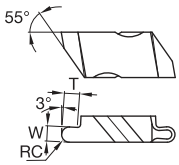
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	RC	T	TN6010	TN6025	THM
right hand							
NR2M050R	2	1,00	0,50	1,27	3606957	3607393	-
NR2M075R	2	1,50	0,75	2,79	3606929	3607469	-
NR2031R	2	1,58	0,79	2,79	3607174	3607301	-
NR2M100R	2	2,00	1,00	2,79	3606930	3607470	-
NR2047R	2	2,39	1,19	2,79	-	3607494	-
NR2M150R	2	3,00	1,50	2,79	-	3607472	-
NR2M175R	2	3,50	1,75	2,79	-	3607483	-
NR3031R	3	1,58	0,79	2,39	3607125	3607475	-
NR3M100R	3	2,00	1,00	2,39	3606958	3607397	-
NR3047R	3	2,39	1,19	3,81	3607093	3607502	-
NR3M125R	3	2,50	1,25	3,81	-	3607439	-

Grooving and Turning Inserts • NR • Full Radius

(continued)





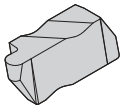
● first choice
○ alternate choice

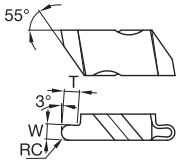
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	RC	T	TN6010	TN6025	THM
NR3M150R	3	3,00	1,50	3,81	3606960	3607440	-
NR3062R	3	3,18	1,59	3,81	3607131	3607473	-
NR3M175R	3	3,50	1,75	3,81	-	3607441	-
NR3M200R	3	4,00	2,00	3,81	-	3607398	-
NR3M225R	3	4,50	2,25	3,81	-	3607442	-
NR3094R	3	4,78	2,39	3,81	3607180	3607476	-
NR4M200R	4	4,00	2,00	6,35	-	3607484	-
NR4M250R	4	5,00	2,50	6,35	-	3607486	-
NR4125R	4	6,35	3,18	6,35	3607130	3607500	-
left hand							
NR2M050L	2	1,00	0,50	1,27	3606948	3607401	-
NR2M075L	2	1,50	0,75	2,79	3606924	3607430	-

Grooving and Turning Inserts • NR • Full Radius

(continued)





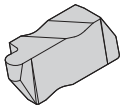
● first choice
○ alternate choice

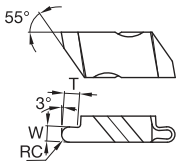
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	RC	T	TN6010	TN6025	THM
NR2031L	2	1,58	0,79	2,79	3607176	3607319	-
NR2M100L	2	2,00	1,00	2,79	-	3607431	-
NR2047L	2	2,39	1,19	2,79	-	3607446	-
NR2M125L	2	2,50	1,25	2,79	-	3607432	-
NR2M150L	2	3,00	1,50	2,79	3606927	3607433	-
NR2M175L	2	3,50	1,75	2,79	-	3607434	-
NR3031L	3	1,58	0,79	2,39	3607139	3607478	-
NR3M100L	3	2,00	1,00	2,39	3606949	-	-
NR3047L	3	2,39	1,19	3,81	3607135	3607479	-
NR3M125L	3	2,50	1,25	3,81	-	3607435	-
NR3M150L	3	3,00	1,50	3,81	-	3607436	-
NR3062L	3	3,18	1,59	3,81	3607171	3607497	3607032

Grooving and Turning Inserts • NR • Full Radius

(continued)





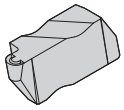
● first choice
○ alternate choice

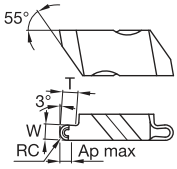
P		●	●	
M		●	●	○
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○	

catalogue number	SSC	W	RC	T	TN6010	TN6025	THM
NR3M175L	3	3,50	1,75	3,81	-	3607437	-
NR3M200L	3	4,00	2,00	3,81	3606953	3607396	-
NR3M225L	3	4,50	2,25	3,81	-	3607438	-
NR3094L	3	4,78	2,39	3,81	-	3607339	-
NR4M250L	4	5,00	2,50	6,35	3606956	-	-
NR4125L	4	6,35	3,18	6,35	-	3607514	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NR-K • Full Radius with Chip Breaker





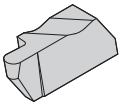
● first choice
○ alternate choice

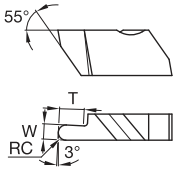
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	SSC	W	Ap max	RC	T	TN6010	TN6025	THM
right hand								
NR3031RK	3	1,57	1,97	0,79	2,39	3607062	3607206	-
NR3047RK	3	2,39	1,91	1,19	3,81	3607086	3607214	-
NR3062RK	3	3,18	2,92	1,59	3,81	3607056	3607236	-
NR3078RK	3	3,97	2,54	1,98	3,81	-	3607407	-
NR4062RK	4	3,18	2,92	1,59	3,81	-	3607461	-
NR4125RK	4	6,35	3,81	3,18	6,35	-	3607303	-
left hand								
NR3031LK	3	1,58	1,98	0,79	2,39	3607095	3607222	-
NR3047LK	3	2,39	3,81	1,20	3,81	3607102	3607408	-
NR3062LK	3	3,18	2,92	1,59	3,81	3607091	3607216	-
NR3078LK	3	3,96	2,54	1,98	3,81	3607172	3607306	-
NR4062LK	4	3,18	2,92	1,59	3,81	3607156	-	-
NR4094LK	4	4,79	3,81	2,39	6,35	3607150	3607452	-
NR4125LK	4	6,36	3,81	3,18	6,35	-	3607458	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Grooving and Turning Inserts • NRD • Deep Grooving • Full Radius





● first choice
○ alternate choice

P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

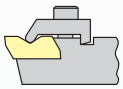
catalogue number	SSC	W	RC	T	cutting edges	TN6010	TN6025	THM
right hand								
NRD3031R	3	1,58	0,79	3,18	2	3607087	3607457	-
NRD3062R	3	3,17	1,59	6,35	1	3607099	3607474	-
NRD4062R	4	3,18	1,59	6,35	2	-	3607499	-
NRD4125R	4	6,35	3,18	12,70	1	-	3607496	-
left hand								
NRD3031L	3	1,58	0,79	3,18	2	3607085	3607455	-
NRD3062L	3	3,17	1,59	6,35	1	3607124	3607462	-
NRD4062L	4	3,18	1,59	6,35	2	-	3607295	-

NOTE: SSC = To correspond with the SSC on the toolholder.

TopGroove Holder • Catalog Numbering System

N	S	R		2525	M	4	
Insert Holding Method	Insert Mounting Location	Hand of Tool	Drop Head	Shank Size	Tool Length	Insert Size	Qualified Surface and Length

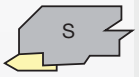
N —
TopGroove*



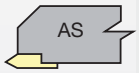
*Proprietary standard only.

End mount

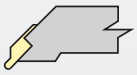
Side mount
Offset



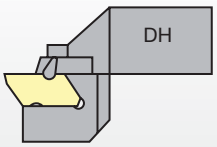
Side mount
No offset
for swiss
machining



NRR undercut



Shank height and width in mm and holder length according to ISO standard.

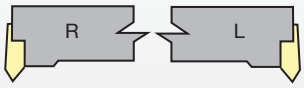


DH = Drop Head

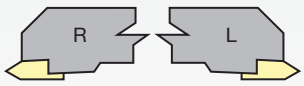
L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	I
125	J
140	K
150	L
160	M
170	N
180	P
200	Q
250	R
300	S
350	T
400	U
450	V
500	W
Special Length	Y
	X

insert size	W1
2	3,81mm
3	4,95mm
4	6,98mm
5	9,65mm
6	9,73mm
8	11,13mm

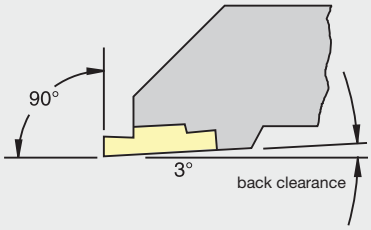
End mount



Side mount



Q —
qualified metric holder

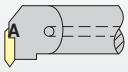


NOTE: Holders are designed to locate insert inclined to 3° to provide back clearance down open side.

TopGroove Boring Bar • Catalog Numbering System

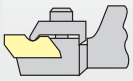
A	25	R	N	N	T	0	R	2
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle	Hand of Tool	Insert Size

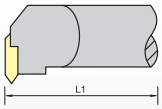
Steel with coolant



Bar diameter

N – TopGroove





Metric Bars	
M	150mm
Q	180mm
R	200mm
S	250mm
T	300mm
U	350mm

End mount

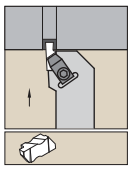
Side mount

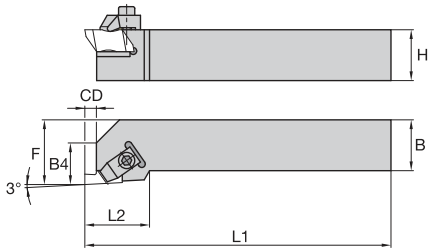
Right hand

Left hand

insert size	W1
1	3,54mm
2	3,81mm
3	5,35mm
4	6,40mm
5	9,65mm
6	9,73mm
8	11,13mm

Integral Toolholders • NS • Metric

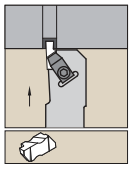


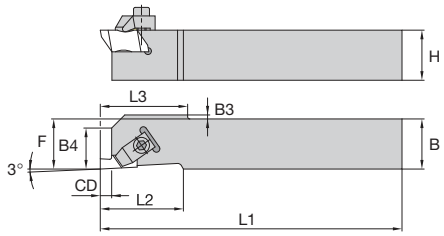


order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert
right hand									
3641660	**NSR1212F2**	12,0	12,0	16,0	80	19	9	4	N.2R
3636542	**NSR1616H2**	16,0	16,0	20,0	100	19	9	4	N.2R
3638589	**NSR2020K2**	20,0	20,0	25,0	125	19	9	4	N.2R
3638588	**NSR2020K3**	20,0	20,0	25,0	125	32	13	5	N.3R
3638590	**NSR2525M2**	25,0	25,0	32,0	150	19	9	4	N.2R
3636536	**NSR2525M3**	25,0	25,0	32,0	150	32	13	5	N.3R
3636540	**NSR2525M4**	25,0	25,0	32,0	150	35	14	7	N.4R
3641666	**NSR3232P3**	32,0	32,0	40,0	170	32	13	5	N.3R
3641669	**NSR3232P4**	32,0	32,0	40,0	170	35	14	7	N.4R
left hand									
3639045	**NSL2020K2**	20,0	20,0	25,0	125	19	9	4	N.2L
3639046	**NSL2020K3**	20,0	20,0	32,0	125	32	13	5	N.3L
3639047	**NSL2525M2**	25,0	25,0	32,0	150	19	9	4	N.2L
3636539	**NSL2525M3**	25,0	25,0	32,0	150	32	13	5	N.3L
3636544	**NSL2525M4**	25,0	25,0	32,0	150	35	14	7	N.4L

NOTE: F dimension measured over sharp point of insert.

Integral Toolholders • NAS • Metric

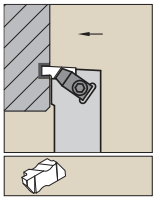


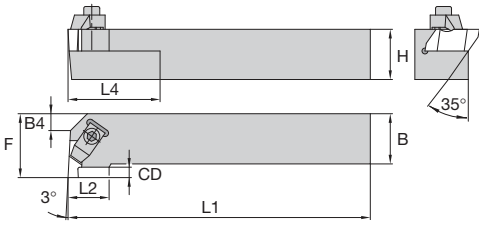


order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert
right hand									
3641662	**NASR1212M2Q**	12,0	12,0	12,0	150	19	9	3,5	N.2R
3639048	**NASR1616K3Q**	16,0	16,0	16,0	125	32	12	5,3	N.3R

NOTE: F dimension measured over sharp point of insert.

Integral Toolholders • NE • Metric



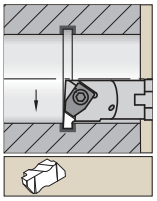


Right-hand toolholder shown.

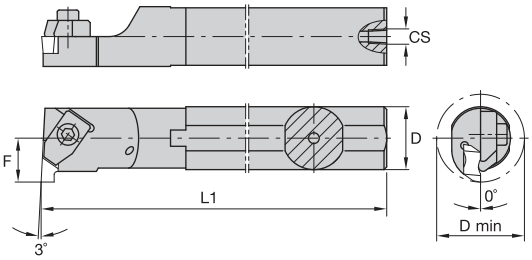
order number	catalogue number	H	B	F	L1	L2	L4	B4	CD	gage insert
right hand										
3641658	**NER2020K2**	20,0	20,0	25,0	125	15	25	6	4	N.2L
3641665	**NER2525M2**	25,0	25,0	32,0	150	15	25	12	4	N.2L
3636541	**NER2525M3**	25,0	25,0	32,0	150	22	51	—	5	N.3L
3641672	**NER2525M4**	25,0	25,0	35,0	150	24	51	—	7	N.4L
left hand										
3641677	**NEL2020K2**	20,0	20,0	25,0	125	15	25	6	4	N.2R
3641676	**NEL2525M2**	25,0	25,0	32,0	150	15	25	12	4	N.2R
3636543	**NEL2525M3**	25,0	25,0	32,0	150	22	51	—	5	N.3R
3641668	**NEL2525M4**	25,0	25,0	35,0	150	24	51	—	7	N.4R

NOTE: F dimension measured over sharp point of insert.

Integral I.D. Grooving Boring Bars • A-NNT • Metric



Steel shank with through coolant.

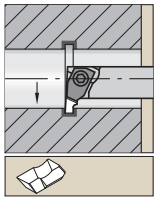


Right-hand toolholder shown.

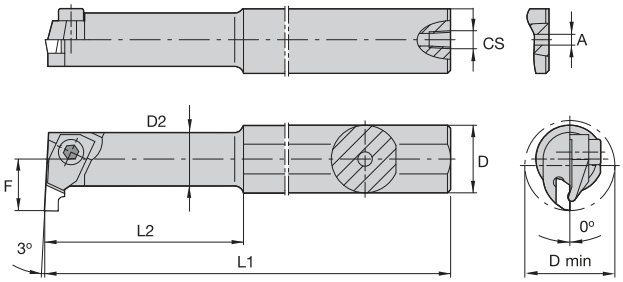
order number	catalogue number	D	D min	L1	F	CS	gage insert
right hand							
3641644	**A12MNNTOR2**	12	18,5	150	11	1/16-27 NPT	NG2L
3641643	**A16MNNTOR2**	16	22,0	150	11	1/8-27 NPT	N.2L
3641645	**A20QNNTOR2**	20	26,0	180	13	1/8-27 NPT	N.2L
3641651	**A25RNNTOR2**	25	34,0	200	17	1/4-18 NPT	N.2L
3641622	**A25RNNTOR3**	25	34,0	200	17	1/4-18 NPT	N.3L
3641646	**A32SNNTOR3**	32	44,0	250	22	1/4-18 NPT	N.3L
3641653	**A40TNNTOR3**	40	54,0	300	27	1/4-18 NPT	N.3L
3641654	**A40TNNTOR4**	40	54,0	300	27	1/4-18 NPT	N.4L
left hand							
3641655	**A12MNNTOL2**	12	18,5	150	11	1/16-27 NPT	NG2R
3641649	**A16MNNTOL2**	16	22,0	150	11	1/8-27 NPT	N.2R
3641652	**A20QNNTOL2**	20	26,0	180	13	1/8-27 NPT	N.2R
3641657	**A25RNNTOL2**	25	34,0	200	17	1/4-18 NPT	N.2R
3641650	**A25RNNTOL3**	25	34,0	200	17	1/4-18 NPT	N.3R
3641656	**A32SNNTOL3**	32	44,0	250	22	1/4-18 NPT	N.3R
3641659	**A40TNNTOL3**	40	54,0	300	27	1/4-18 NPT	N.3R

NOTE: Minimum bore capability varies with depth of groove. See page E418 for details.
F dimension measured over sharp point of insert.

Integral I.D. Grooving Boring Bars • A-NNT-1 • Metric



Necked steel shank with through coolant.



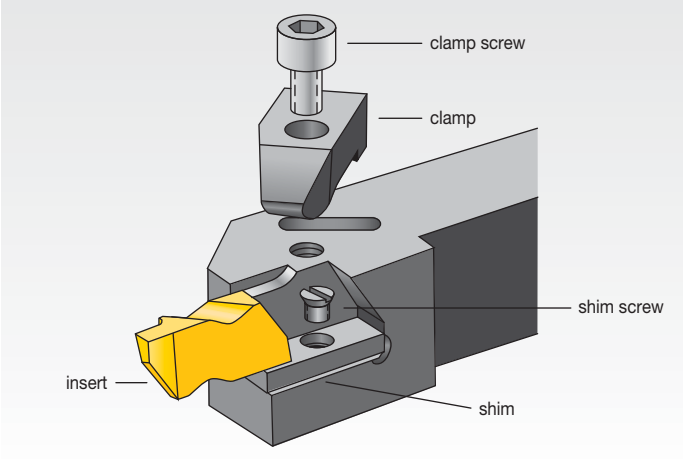
Right-hand toolholder shown.

order number	catalogue number	D	D min	D2	L1	L2	F	A	CS	gage insert
right hand										
3641648	**A10KNNTOR1**	10	11,5	10,0	125	—	7	3,2	—	NG1L
3641647	**A12MNNTOR1**	12	11,5	8,7	150	31,30	7	4,0	1/16-27 NPT	N.1L

NOTE: Minimum bore capability varies with depth of groove. See page E418 for details.
F dimension measured over sharp point of insert.

Hardware

TopGroove Toolholders and Boring Bars



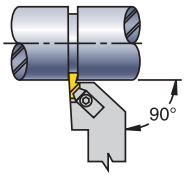
insert size and style	clamp	clamp screw	shim	shim screw
NG-1L	CM-109	S-304	–	–
NG-2R	CM-182	S-310	–	–
NG-2L	CM-183	S-310	–	–
NG-2R	CM-74	S-310	–	–
NG-2L	CM-75	S-310	–	–
NG-3R	CM-184	S-412	–	–
NG-3L	CM-185	S-412	–	–
NG-3R	CM-72	S-412	–	–
NG-3L	CM-73	S-412	–	–
NG-3R*	CM-78	S-412	–	–
NG-3L*	CM-70	S-412	–	–
NG-4R	CM-72	S-412	SM-420	SL-344
NG-4L	CM-73	S-412	SM-420	SL-344
NG-5R	CM-80	S-352	–	–
NG-5L	CM-81	S-352	–	–
NG-6R	CM-120	S-412	SM-416	S-111
NG-6L	CM-121	S-412	SM-416	S-111
TopGroove relief grooving				
NU-3125R	CM-72	S-412	–	–
NU-3125L	CM-73	S-412	–	–
NU-3125R**	CM-72	S-618	–	–
NU-3125L**	CM-73	S-618	–	–
Utility threading				
NTU-4R	CM-72	S-412	–	–
NTU-4L	CM-73	S-412	–	–

**25mm diameter boring head.*
***Boring head.*

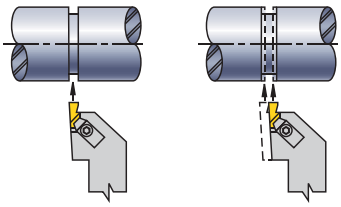
Grooving Tool Failure and Solution Guide

Practical Solutions to Common Grooving Problems

Holder Position for Grooving Operation

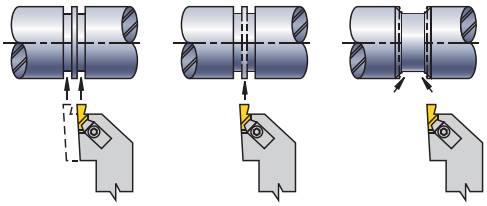


How to Cut a Groove Slightly Wider than the Groove Tool



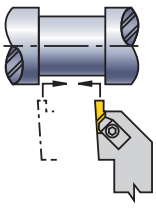
1. Plunge the center of the groove.
2. Plunge each side of the groove to get the specified width. Use a slower feed rate when cutting groove sides.

How to Cut Wider Grooves



1. Plunge out both sides of groove width.
2. Plunge center area to remove web of material remaining.
3. Plunge both sides of groove at the required angle, using approximately one-half the width of the grooving tool for maximum width of cut.

Finish Turning the Groove



1. Follow recommendations explained above.
2. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined here.
3. Use the lightest depth of cut that still enables good chip surface finishing.

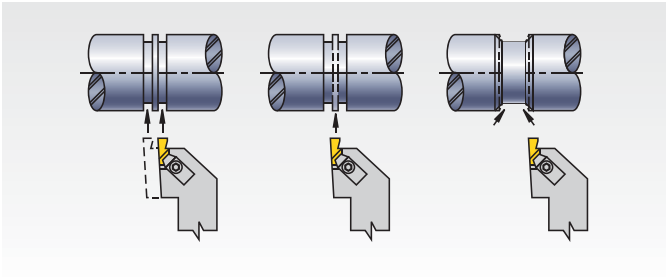
problem	solution
bur	1. Ensure tool center height. 2. Use sharp tool (index more often). 3. Use positive rake PVD-coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for work-hardening material). 6. Chamfer before grooving. 7. Change tool path.
poor surface finish	1. Increase speed. 2. Use sharp tool (index more often). 3. Dwell tool in bottom 1–3 revolutions (max). 4. Use proper chip control geometry. 5. Increase coolant flow/concentration. 6. Ensure proper setup (overhang, shank size). 7. Use correct geometry (e.g., positive rake for work-hardening material).
groove bottom that is not flat	1. Use sharp tool (index more often). 2. Dwell tool in bottom 1–3 revolutions (max). 3. Reduce tool overhang (increase rigidity). 4. Ensure correct tool alignment. 5. Reduce feed rate at groove bottom. 6. Use a wider insert. 7. Ensure tool center height.
poor chip control	1. Use “K” chip control geometry insert. 2. Use sharp tool (index more often). 3. Increase coolant concentration. 4. Adjust feed rate (usually increase first).
chatter	1. Reduce tool and workpiece overhang. 2. Adjust speed and feed (usually increase first). 3. Ensure center height.
insert chipping	1. Use correct grade for workpiece material. 2. Increase speed. 3. Reduce feed. 4. Use a stronger grade. 5. Increase tool and setup rigidity.
side walls not straight	1. Check tool alignment for square. 2. Use correct insert hand. 3. Reduce workpiece and tool overhang. 4. Use sharp insert (index more often).

Machining Guidelines

Machining Guidelines for Chip Control • Grooving

When the proper cutter diameter is not available, proper cutter positioning will provide positive results.

- Center height of insert should be positioned at the center of the workpiece or up to 0,13mm above.
- Dwell time in the bottom of the groove (more than three revolutions) is not recommended.
- Chip control is feed rate related and should be adjusted to fit the particular situation. Recommended feed range is 0,08–0,3 mm/rev.

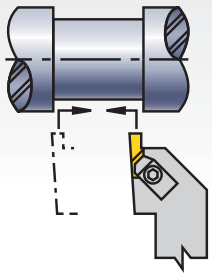


Machining Guidelines for Chip Control • Turning/Profiling

Maximum depth of cut for side cutting (turning/profiling) depends on the material being cut and the width of the tool.

- 0,79–1,6mm wide insert can cut up to 0,6mm deep.
- 1,7–3,3mm wide insert can cut up to 1mm deep.
- 3,5–4,8mm wide insert can cut up to 2mm deep.
- 5–6,35mm wide insert can cut up to 3mm deep.

Finish Turning the Groove



1. Plunge both sides of groove width.
2. Plunge center area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined.
4. Use the lightest depth of cut that still allows good chipbreaking, tool life, and surface finish.

Groove Limits

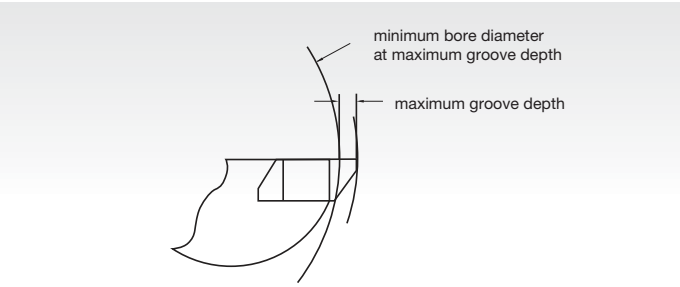
insert catalogue number	maximum internal groove depth mm	minimum bore diameter mm
NG-1094L	1,91	20,32
—	1,02	11,18
NG-2031R/L	1,27	18,54
NG-2041R/L	—	—
NG-2047R/L	—	—
NG-2058R/L	—	—
—	2,79	63,50
NG-2062R/L	2,59	44,45
NG-2094R/L	2,49	38,10
NG-2125R/L	2,03	25,40
—	1,40	18,54
NG-3047R/L	—	—
NG-3062R/L	2,39	44,45
NG-3072R/L	2,29	41,28
NG-3078R/L	1,91	34,93
NG-3088R/L	—	—
NG-3094R/L	—	—
NG-3097R/L	3,81	60,33
NG-3105R/L	—	—
NG-3110R/L	3,68	53,98
NG-3122R/L	—	—
NG-3125R/L	3,51	47,63
NG-3142R/L	—	—
NG-3156R/L	3,18	41,28
NG-3178R/L	—	—
NG-3185R/L	2,79	34,93
NG-3189R/L	—	—
NG-4125R/L	3,81	69,85
—	6,35	146,05
NG-4189R/L	6,22	127,00
NG-4213R/L	6,10	114,30
NG-4219R/L	5,54	82,55
NG-4250R/L	5,08	63,50

NOTE: The same maximum groove depth and minimum bore diameter values also apply to metric, NG-K (chip control), and NR (full radius) inserts of similar size.
The same internal grooving depth limits are a function of bar clearance versus bore diameters.

Machining Guidelines

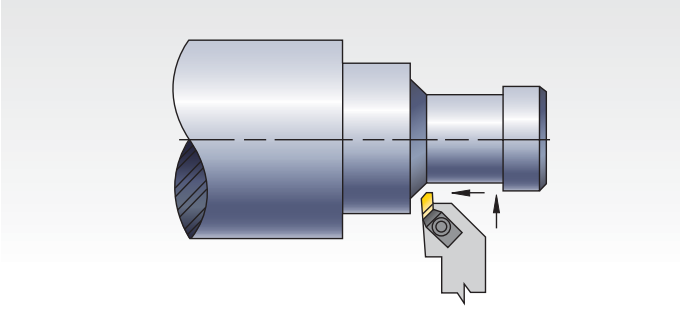
Internal Groove Depth versus Bar Interference

NOTE: Internal grooving depth limits are a function of bar clearance versus bore diameters.



Machining Guidelines for Back Turning/ Turning/Profiling

The NP-K-style TopGroove inserts were engineered specifically for back turning on small automatic lathes, but they also find applications for other light turning and profiling operations. For general applications, maximum depth of cut should not exceed 2,74mm for size 2 inserts or 3,84mm for size 3 inserts.



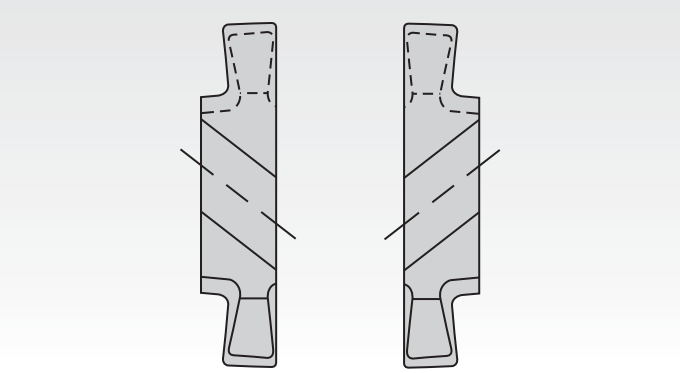
Machining Guidelines for Using TopGroove Deep Grooving Inserts (NGD)

Typically, those NGD- and NRD-style inserts with two cutting edges require no machine offset changes. However, those inserts with only one cutting edge do require offset changes. Refer to the chart here to ensure proper offset adjustments.

insert catalogue number	add to C dimension mm	add to F dimension mm
NGD-3062	0,00	0,00
NGD-3094	2,54	2,54
NGD-3125	2,54	2,54
NGD-3189	2,54	2,54
NGD-4125	0,00	0,00
NGD-4189	3,18	3,18
NGD-4250	6,35	6,35
NRD-3031	0,00	0,00
NRD-3062	2,54	2,54
NRD-4062	0,00	0,00
NRD-4094	6,35	6,35
NRD-4125	6,35	6,35

TopGroove Insert Selection Guide

- All TopGroove inserts are precision ground to provide accurate edge location and secure locking of the insert in the toolholder pocket.
- TopGroove inserts can be used in either toolholders or boring bars.
- Right-hand TopGroove toolholders use right-hand inserts. Left-hand TopGroove toolholders use left-hand inserts.
- Right-hand TopGroove boring bars use left-hand inserts. Left-hand TopGroove boring bars use right-hand inserts.



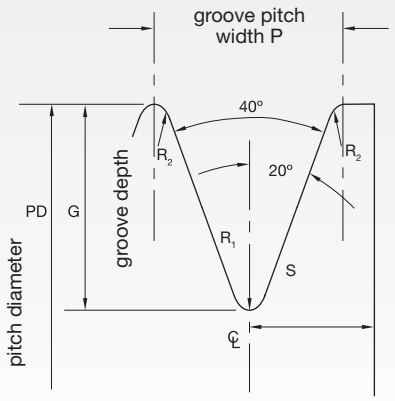
left-hand insert right-hand insert

Machining Guidelines

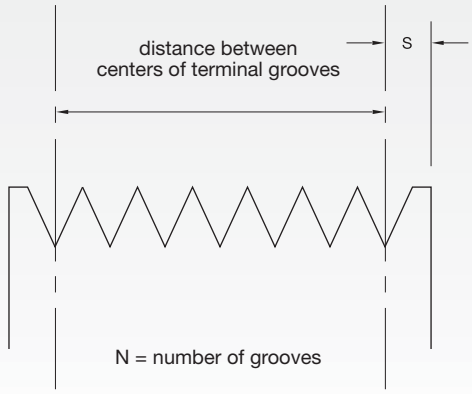
Machining Guidelines for Poly-Vee Grooving with Custom Solution and TopGroove NV Inserts (NV3-J and NV4-L)

- To machine cross section “J”, use insert NV3-J.
- To machine cross section “L”, use insert NV4-L.

Section J



Section L

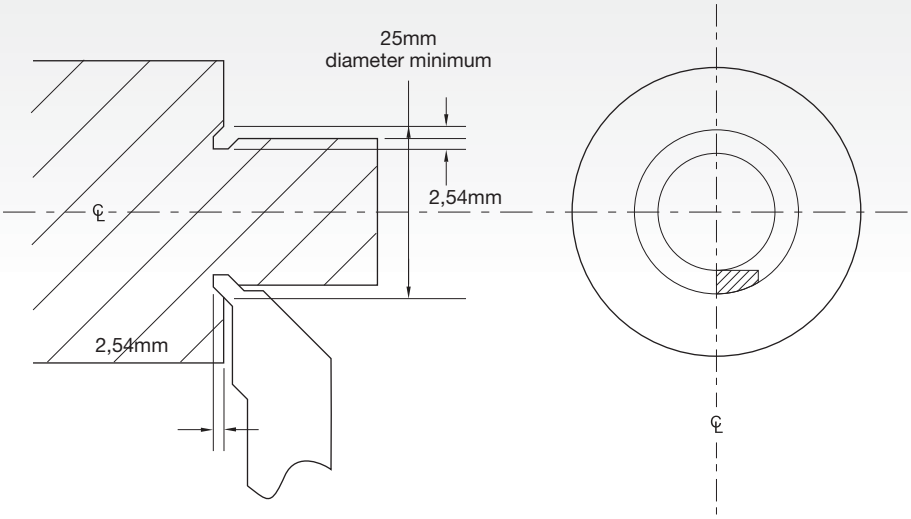


Groove Dimensions and Tolerances for Sheaves

groove cross section	pitch width (P)	groove depth (G)	minimum radius (R2)	radius (R1)	terminal distance	distance between centers of terminal grooves and maximum accumulated tolerance
J	2,34 ±0,03	2,21 ±0,13	0,20	0,32 ±0,06	3,18	(N-1)4,88 ±0,25
L	4,70 ±0,05	5,11 ±0,13	0,38	0,32 ±0,06	3,18	(N-1)4,70 ±0,25

Machining Guidelines

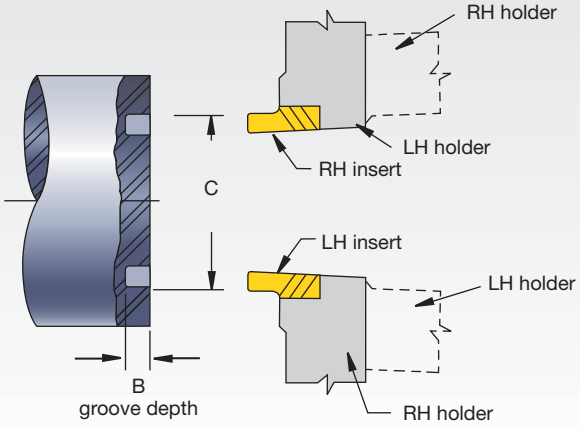
Machining Guidelines for Undercutting Operations Performed with Custom Solution and TopGroove NU Inserts (NU3094, NU3125, and NU3156)



Machining Guidelines

Machining Guidelines for Face Grooving Operations • External

Toolholders

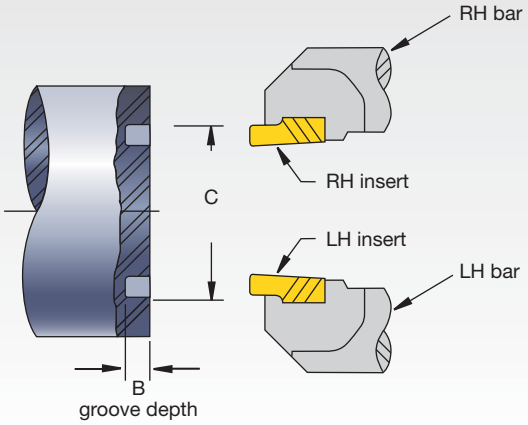


Standard NF/NDF Inserts

insert family	maximum groove depth B mm	minimum groove diameter C mm
NF-3	1,52	23,9
NF-3	2,39	30,5
NF-3	3,18	36,1
NF-3	3,81	41,3
NFD-3	6,35	47,6
NFD-4	9,53	57,2
NFD-4	12,70	57,2

Machining Guidelines for Face Grooving Operations • External

Boring Bars



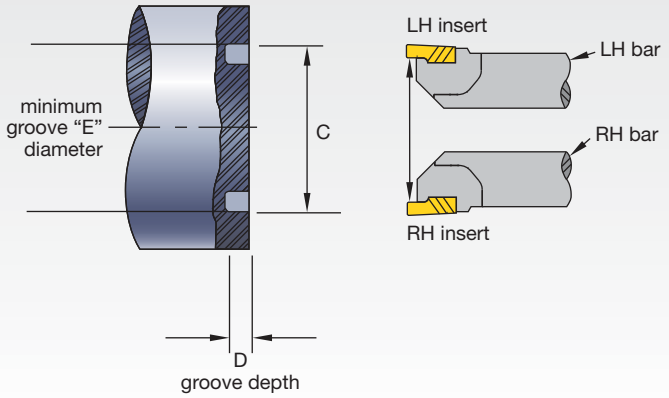
Standard NG/NGD Inserts

insert family	maximum groove depth B mm	minimum groove diameter C mm
NG-2	1,27	54,0
NG-2	2,79	88,9
NG-3	2,39	101,6
NG-3	3,18	127,0
NG-3	3,81	139,7
NGD-3	6,35	174,6
NG-4	3,81	152,4
NG-4	6,35	209,6
NGD-4	9,53	222,3
NGD-4	12,70	222,3

Machining Guidelines

Machining Guidelines for Face Grooving Operations • Internal

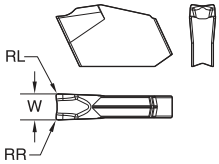
Boring Bars



Standard NG/NGD Inserts

insert family	maximum groove depth B mm	minimum groove diameter C mm
NFD-3-KI	6,35	63,5 *NOTE: Also check minimum bore diameter of boring bar. See page E418.*

Grooving and Turning Inserts • WGT-N



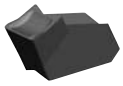
RR = RL *on neutral inserts*

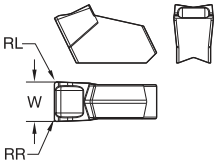
● first choice
○ alternate choice

	TN6010	TN6025	THM
P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	W mm	W in	RL mm	RL in	TN6010	TN6025	THM
WGTN2	2,25	.089	0,18	.007	-	4103785	-
WGTN3	3,05	.120	0,22	.009	-	4103784	-
WGTN3W	3,05	.120	0,22	.009	-	4103798	-
WGTN4	4,05	.159	0,24	.009	-	4103787	-
WGTN48	4,80	.189	0,26	.010	-	4103797	-
WGTN5	5,05	.199	0,26	.010	-	4103792	-

Grooving and Turning Inserts • WGF





RR = RL *on neutral inserts*

● first choice
○ alternate choice

P	●	●	
M	●	●	○
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	W mm	W in	RL mm	RL in	TN6010	TN6025	THM
WGFN2	2,20	.087	0,16	.006	-	4109153	-
WGFN24	2,40	.095	0,16	.006	-	4109154	-
WGFN3	3,00	.118	0,25	.010	-	4109097	-
WGFN4	4,10	.161	0,28	.011	-	4109102	-
WGFN6	6,39	.251	0,35	.014	-	4109164	-

LG Grooving

Large-Width Grooving

The LG Grooving platform is designed for large-width grooving using periphery ground inserts for close tolerances. (+/-.05mm)

- Inserts available from 8.15–16.20mm.
- Inserts feature a bottom 'V' for secure seating on the pocket seat.
- Grade WU35CT with easy-wear identification.
- The chip groove design with positive rake enables good chip control and reduced forces.

ENERGY

Primarily used in the Energy segment for grooving operations on turbine rotors.

BENEFITS

VERSATILITY

Single-sided, versatile grooving and cut-off solution with smooth surface finish.

STABILITY

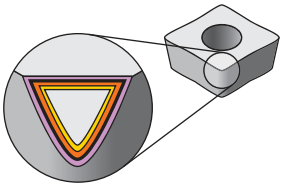
Insert seating and clamping mechanism ensures stability and reliability in heavy-duty applications.

APPLICATIONS

O.D. GROOVING

DEEP GROOVING

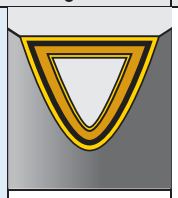
Grades and Grade Descriptions



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ⟷ toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
WU35CT	 –	Coated carbide MT-CVD/CVD – TiN-TiCN-Al_2O_3-TiN. A good combination of tough substrate and wear-resistant, multi-layer CVD coating. Suitable for rough turning in most steels and also stainless steel.	P									
			M									

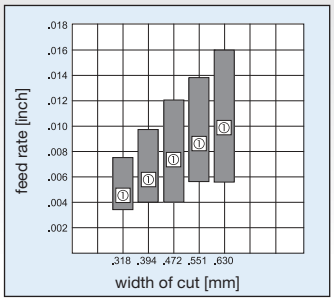
Feed Values for Grooving Inserts

LG System • 0

0

...0

Inserts with wide range of applications in grooving and deep grooving. With additional chip control element for good chip control, even with varying widths of cut.

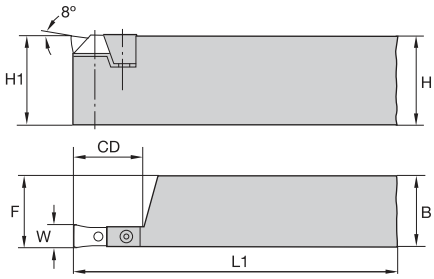


① Recommended Starting Feed

Recommended Cutting Speeds • Metric

Material Group		Cutting Speed — vc m/min WU35CT min	Start	max
P	0/1	140	175	210
	2	115	145	175
	3	115	145	175
	4	75	100	120
	5	105	140	170
	6	45	60	75
M	1	90	110	140
	2	75	90	115
	3	55	70	90

Integral Toolholders • LG • Metric



Right Hand Tool

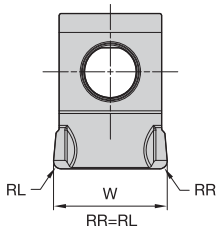
order number	catalogue number	SSC	W	CD	H	B	F	L1	H1
right hand									
2022446	**12250110100**	1	8,00	20,0	32	25,0	25,5	170	32
2008147	**12250110300**	1	10,00	20,0	32	25,0	25,5	170	32
2021719	**12250110500**	1	12,00	25,0	40	32,0	33,0	200	40
2021721	**12250110700**	1	14,00	28,0	40	32,0	33,0	200	40
2008521	**12250110900**	1	16,00	32,0	40	32,0	33,0	200	40
left hand									
2022447	**12250110200**	1	8,00	20,0	32	25,0	25,5	170	32
2008144	**12250110400**	1	10,00	20,0	32	25,0	25,5	170	32
2021718	**12250110600**	1	12,00	25,0	40	32,0	33,0	200	40
2021722	**12250111000**	1	16,00	32,0	40	32,0	33,0	200	40

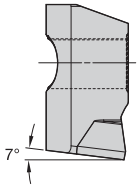
NOTE: SSC = To correspond with the SSC on the insert.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

Grooving and Turning Inserts • LG LGN0





● first choice
○ alternate choice

P	●
M	○
K	
N	
S	
H	

catalogue number	W	RR	WU35CT
123568080	8,15	0,80	6909025
123568100	10,15	0,80	6909026
123568120	12,20	0,80	6909027
123568140	14,20	0,80	6909028
123568160	16,20	0,80	6909029

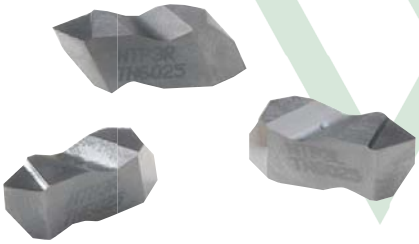
TopThread™

High-Demand Application Threading

Count on the WIDIA™ TopThread system for when high heat, high edge-line load concentrated to a small nose radius, and high feed rates combine to place tremendous demands on carbide threading inserts. TopThread insert technology brings superior chip control to high-demand applications like machining Acme, Buttress, and API threads.

TOOLHOLDERS

- Reduced inconsistencies and better workpiece finish.
- TopThread inserts are precision-ground to provide accurate edge location and secure locking of the insert in the toolholder pocket.
- Excellent choice for special thread forms and toolholder designs.
- TopThread inserts are available in TN6010™ and TN6025™ grades to withstand the demands placed on the cutting edge of the threading insert.



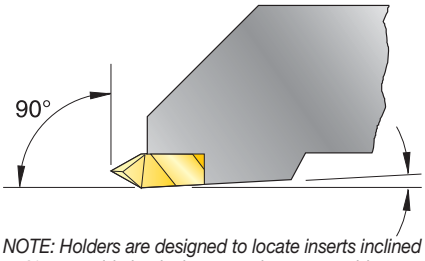
INSERTS

- Rigid design for increased stability during threading applications.
- Good quality threads, improved tool life, and improved surface finishes.
- Locking forces in three directions for superior resistance to tangential force.
- Unique 3° insert relief angle for back clearance.
- Available in partial profile inserts for 60° thread forms.

THE SIMPLE SOLUTION

VERSATILE

The versatility of the TopThread steel enables you to use both threading and grooving inserts in the same toolholder.



NOTE: Holders are designed to locate inserts inclined to 3° to provide back clearance down open side.

HIGH-DEMAND APPLICATION THREADING

TopThread™

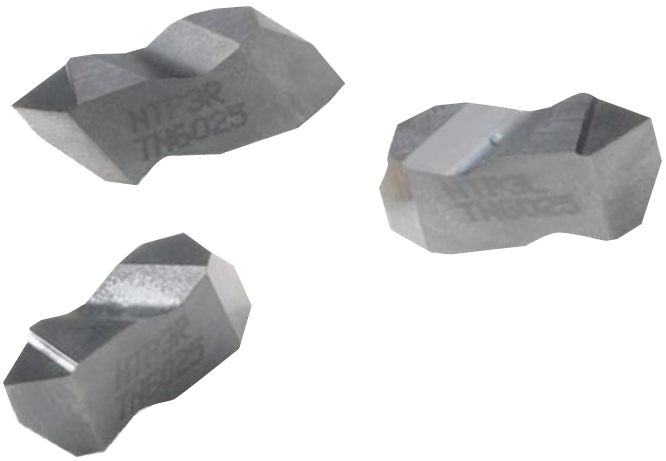
INSERT STYLE	OPTIMUM CUTTING CONDITIONS	FIRST CHOICE	MATERIALS
Chip control or neutral	**TN6010** 160–750	**TN6025** 130–650	P
Chip control or positive	**TN6010** 160–600	**TN6025** 130–450	M
Neutral	**TN6010** 230–700	**TN6025** 200–475	K
Positive	–	**TN6025** 160–1150	N
Positive	**TN6010** 65–400	**TN6025** 35–330	S

INDUSTRY

GENERAL ENGINEERING

AEROSPACE

TRANSPORTATION



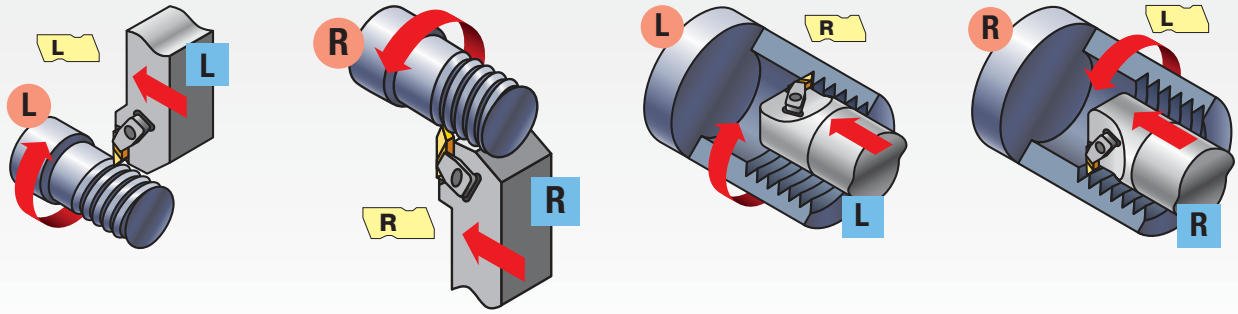
Threading Selection Guide

Step 1 • Select Threading Method and Hand of Tooling

Required Information:
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.

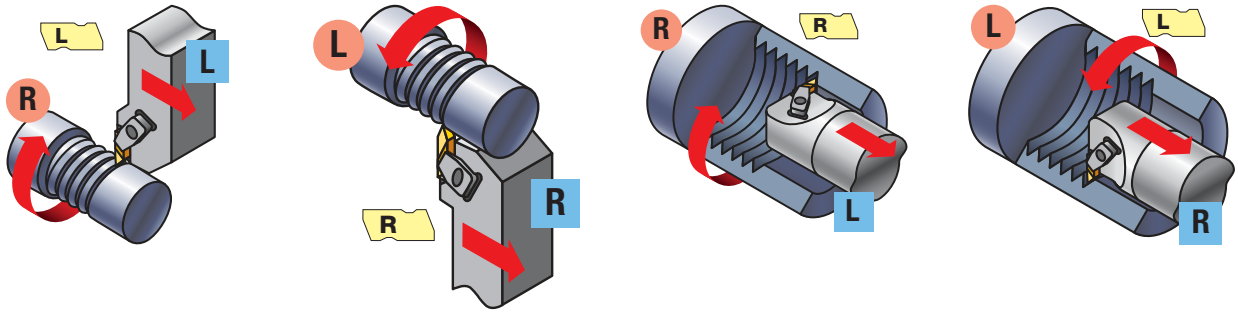
hand of thread | hand of toolholder | hand of insert

Feed direction toward the chuck • RECOMMENDED



external left-hand thread | external right-hand thread | internal left-hand thread | internal right-hand thread

Feed direction away from the chuck



external right-hand thread | external left-hand thread | internal right-hand thread | internal left-hand thread

Step 2 • Select Holder from Catalog Page

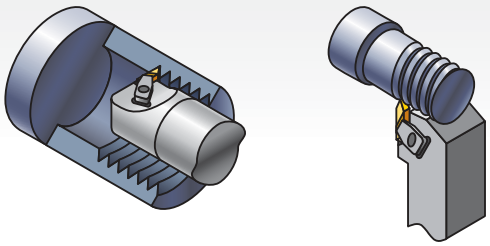
The insert size must match the gage insert size of your toolholder selection:

Required Information:
- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

catalogue number	gage insert
NSR-163D	N.3R
NSR-164D	N.4R

NOTE: TopThread toolholders and boring bars are listed with a gage insert to indicate the size and hand required. They are compatible with both grooving and threading inserts of the same size.

Select the appropriate holder for the insert size and hand:



NOTE: Optimize your threading operation by using the proper infeed method and the recommended infeed values.

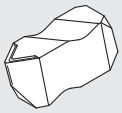
See the Technical section on pages E502–E503 of this catalog.

For internal threading, minimum bore varies depending on thread type. See page E418 for details.

Threading Selection Guide

Step 3 • Choose Insert for Application

- See threading insert overview on page E434.
- Select cresting inserts for fully controlled thread form including diameter control. Cresting inserts eliminate the need for deburring.
- Non-cresting partial profile inserts can cut a variety of thread pitches.
- Note insert size for toolholder selection.



insert size	catalog number	TN6025	TN6010
2	NT-2RK	●	●
3	NT-3RK	●	●
4	NT-4RK	●	●

Step 4 • Select Grade and Speed

Recommendations for Grade and Speed Selection — m/min (SFM)

workpiece material	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys
insert style	chip control or neutral	chip control or positive	neutral	positive	positive
optimum cutting conditions	**TN6010** 160–750	**TN6010** 160–600	**TN6010** 230–700	–	**TN6010** 65–400
first choice	**TN6025** 130–650	**TN6025** 130–450	**TN6025** 200–475	**TN6025** 160–1150	**TN6025** 35–330

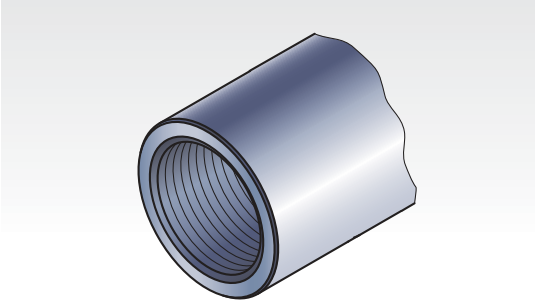
Examples:
Chip Control: NT-K or NT-CK (partial profile only)
Neutral: NT, NT-C, NTF, NTC, NJ, NJF, NDC-V, NA, NDC, NTB-A/B
Positive: NTP, NTK, NJP, NJK

TopThread Threading Example:

application: 8 TPI Acme internal right-hand thread
material: alloy steel
workpiece diameter: 114,3mm
good cutting conditions
feed towards the chuck

Recommendation:

insert:	NA3L8
grade:	TN6010
insert size:	3
boring bar:	A40NER3
gage insert:	N.3L
speed:	150 m/min
infeed passes*:	12 passes

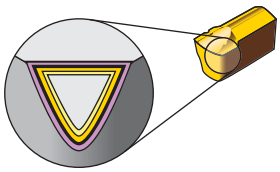


** Infeed recommendations provided in technical data section on pages E502–E503.*

Insert Overview

style						thread profile	standard	tolerance class	cresting	application	page(s)
chip control — K		neutral		positive							
NT-K		NT		NTP		Partial Profile 60°	–	–	N	General use for 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	**E438–E441**
NT-CK						Partial Profile 60° — coarse pitch	–	–	N	Coarse pitch 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	**E442**
		NTF		NTK		Partial Profile 60° — fine pitch	–	–	N	Fine pitch 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches — able to thread close to shoulders.	**E442–E443**
		NTC				American UN	ANSI B1.1:74	2A/2B	Y	Widely used inch-based 60° V-form for all industries.	**E444**
				NJP		UNJ	SAEA588791	3A/3B	N	Controlled root radius on external threads for military and aerospace industries.	**E445**
				NJK		UNJ — fine pitch	SAEA588790	3A/3B	N	Controlled root radius on external threads for military and aerospace industries — able to thread close to shoulders.	**E445**
		NDC-V				NPT	ANSI/ACME B1.201: 1983	Standard NPT	Y	National Pipe Thread standard forms for pipe fittings.	**custom solution**
		NDC-V-M				NPT — multi-tooth	ANSI/ACME B1.201: 1983	Standard NPT	Y	High-productivity multi-tooth threading inserts for NPT threads.	**custom solution**
		NWC-E				Whitworth, BSW, BSP	BS 84:1956, ISO 228/1: 1982, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections.	**E446**
		NDC-RD				API Round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry, including 8 and 10 round forms.	**E446**
		NA				Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries.	**E447**
		NAS				Stub Acme	ANSI B1.8:1988	2G	N	Shallow depth 29° truncated thread form for motion applications in a wide variety of industries.	**E448**
		NTB-B				American Buttress — 45° clearance flank leading (Pull)	ANSI B1.9:1973	Class 2	N	Sawtooth form for axial load bearing applications in a variety of industries — use the "B" style when the 45° clearance flank is the leading flank.	**E448**

Grades and Grade Descriptions

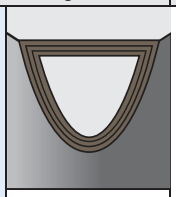
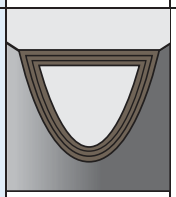
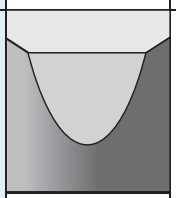


Coatings provide high-speed capability and are engineered for finishing to light roughing.

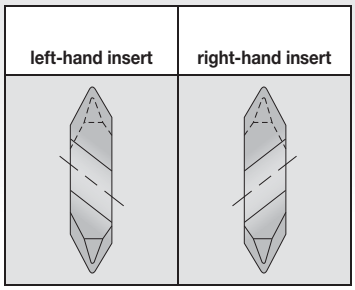
- Reduce cycle times — high-speed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
TN6010	 HC-P10	An advanced PVD TiAlN coating over a very deformation-resistant unalloyed carbide substrate. TN6010 is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P									
			M									
			K									
			N									
			S									
			H									
TN6025	 HC-P25	An advanced PVD TiAlN-coated grade with a tough, ultra-fine-grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P									
			M									
			K									
			N									
			S									
THM	 HW-K15	Uncoated carbide for light and medium machining. For cast iron, all non-ferrous metals, and non-metals. Also capable of machining hardened materials at low cutting speeds.										
			K									
			N									
			S									

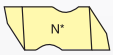
- All TopThread inserts are precision-ground to provide accurate edge location and secure locking of the insert in the toolholder pocket.
- TopThread inserts can be used in either toolholders or boring bars.
- All non-cresting-type threading inserts can be used for either external or internal applications. All cresting-type inserts are designated specifically for external or internal use.
- Right-hand TopThread toolholders use right-hand inserts. Left-hand TopThread toolholders use left-hand inserts.
- Right-hand TopThread boring bars use left-hand inserts. Left-hand TopThread boring bars use right-hand inserts.
- See this page for carbide grade selection and more technical information.



Catalog Numbering System

N	D	C	3	8RD	R	75	
Type of Insert	Insert	Additional Information	Insert Size	Industry Thread Identification	Hand of Insert	Definition of Insert	Additional Information

N — TopThread



B — Buttress

F — Fine pitch

S — Stub Acme

C — Cresting

P — Positive rake

K — Fine pitch, positive

Indicates API or drilling industry form designation (e.g., 10RD, 8RD, .038) or controlled root radius threading inserts indicate the root radius in .001" increments (NJ, NJF, NJP, NJK) or M indicates metric ISO thread

R — Right hand

L — Left hand

- Threads per inch or pitch (for metric)
- "A" or "B" type Buttress insert
- Taper per foot — API threads

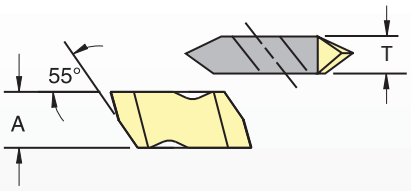
A — Acme

D — API or NPT

J — UNJ thread

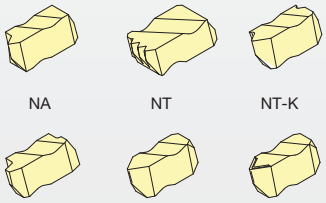
T — 60° V thread

W — 55° V Whitworth



TopThread insert dimensions

insert size	A mm	T mm
1	2,54	2,54
2	5,56	3,81
3	8,74	4,95
4	11,51	6,48
5	17,48	9,65
6	11,51	9,73
8	7,93	11,13



I — Internal thread

E — External thread (used only if internal and external thread forms are different)

M — Multiple tooth

K — Standard chip control

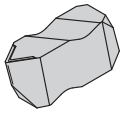
C — Coarse pitch

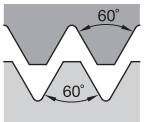
D — Dryseal

Recommended Cutting Speeds • Metric

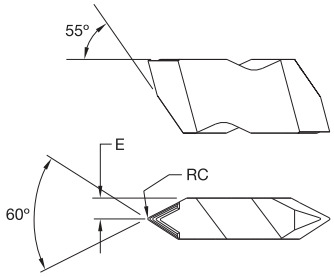
		Cutting Speed — vc m/min								
		TN6010			TN6025			THM		
	Material Group	min	Start	max	min	Start	max	min	Start	max
P	0/1	140	**175**	210	130	**140**	150	90	**95**	100
	2	115	**145**	175	110	**145**	175	75	**100**	125
	3	115	**145**	175	110	**145**	175	75	**100**	125
	4	75	**100**	120	75	**95**	115	55	**65**	80
	5	105	**140**	170	100	**125**	145	70	**85**	100
	6	45	**60**	75	40	**55**	65	30	**40**	45
M	1	90	**115**	140	60	**75**	90	60	**75**	90
	2	55	**70**	90	40	**50**	55	50	**60**	75
	3	60	**80**	95	40	**50**	60	40	**50**	55
K	1	120	**150**	180	60	**80**	90	70	**90**	100
	2	120	**150**	180	60	**75**	85	50	**65**	80
	3	110	**140**	170	60	**75**	90	60	**70**	80
N	1	600	**750**	900	600	**750**	900	600	**750**	900
	2	535	**685**	835	535	**685**	835	500	**650**	800
	3	230	**300**	370	230	**300**	370	600	**750**	900
	4	135	**180**	225	135	**180**	225	500	**650**	800
	5	70	**90**	110	70	**90**	110	230	**300**	370
	6	445	**565**	690	445	**565**	690	150	**200**	250
	7	550	**700**	850	550	**700**	850	150	**200**	250
S	1	35	**40**	50	25	**35**	40	25	**35**	45
	2	20	**20**	30	15	**20**	20	20	**30**	35
	3	60	**70**	80	40	**60**	70	15	**25**	30
	4	30	**35**	45	20	**30**	35	10	**15**	20
H	1	15	**30**	60	–	**–**	–	–	**–**	–
	2	15	**30**	60	–	**–**	–	–	**–**	–
	3	15	**30**	60	–	**–**	–	–	**–**	–
	4	15	**30**	60	–	–	–	–	**–**	–

Threading Inserts • NT-K





Partial Profile 60°



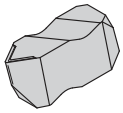
● first choice
○ alternate choice

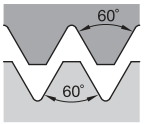
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NT2RK	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607651	3607837	-
NT4RK	0,16	3,24	4	1,25-6,25	2,0-6,25	4-20	4-12	-	3607846	-
NT3RK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607643	3607824	-
left hand										
NT2LK	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607674	3607833	-
NT3LK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607645	3607828	-

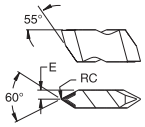
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NT-K





Partial Profile 60°



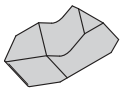
● first choice
○ alternate choice

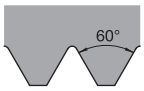
P		●	●							
M		●	●							
K		●	○	●						
N		●	○	○						
S		●	●	○						
H		○	○							

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
left hand										
NT2LK	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607674	3607833	-
right hand										
NT2RK	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607651	3607837	-
NT4RK	0,16	3,24	4	1,25-6,25	2,0-6,25	4-20	4-12	-	3607846	-
NT3RK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607643	3607824	-
left hand										
NT3LK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607645	3607828	-

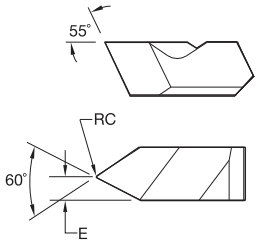
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NT-1L





Partial Profile 60°
Internal



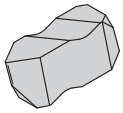
● first choice
○ alternate choice

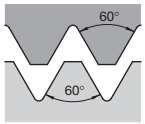
P		●	●							
M		●	●							
K		●	○	●						
N		●	○	○						
S		●	●	○						
H		○	○							

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
left hand										
NT1L	0,08	1,09	1	–	1,0-2,0	–	12-24	3636551	3636555	-

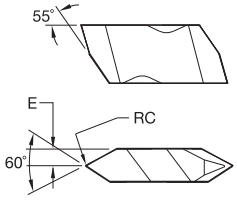
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NT





Partial Profile 60°



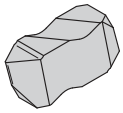
● first choice
○ alternate choice

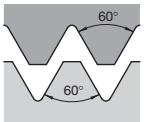
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NT2R	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607647	3607843	-
NT3R	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607530	3607825	-
NT4R	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607676	3607834	-
left hand										
NT2L	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607675	3607835	-
NT3L	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607532	3607826	-
NT4L	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	-	3607849	-

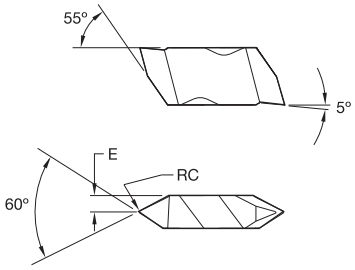
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTP





Partial Profile 60°



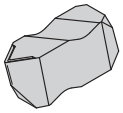
● first choice
○ alternate choice

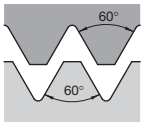
P		●	●	
M		●	●	
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTP2R	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607677	3607841	-
NTP3R	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607644	3607823	-
NTP4R	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	-	3607839	-
left hand										
NTP2L	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607678	3607840	-
NTP3L	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607650	3607831	-

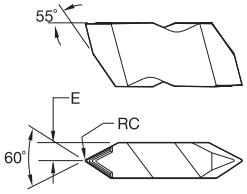
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NT-CK





Partial Profile 60°



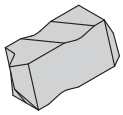
● first choice
○ alternate choice

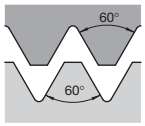
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NT3RCK	0,34	2,46	3	2,5-4,0	4,0	6-11	6	-	3607838	-

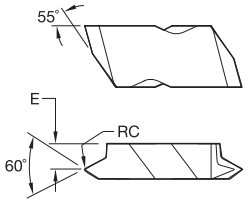
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTF





Partial Profile 60°



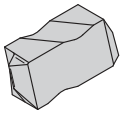
● first choice
○ alternate choice

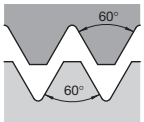
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTF2R	0,08	2,79	2	0,60-1,75	1,0-2,0	14-44	12-24	3607673	3607852	-
NTF3R	0,08	3,58	3	0,60-2,5	1,0-2,5	10-44	9-24	3607531	3607830	-
left hand										
NTF3L	0,08	3,58	3	0,60-2,5	1,0-2,5	10-44	9-24	3607652	3607832	-

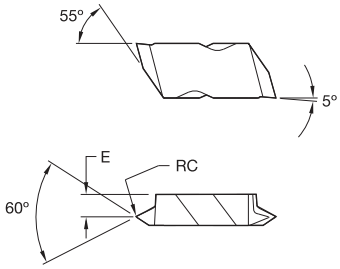
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTK





Partial Profile 60°



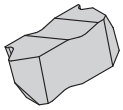
● first choice
○ alternate choice

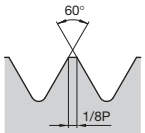
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTK2R	0,08	2,79	2	0,60-1,75	1,0-2,0	14-44	12-24	3607646	3607836	-
NTK3R	0,08	3,58	3	0,60-2,50	1,0-2,5	10-44	9-24	3607528	3607827	-
left hand										
NTK3L	0,08	3,58	3	0,60-2,50	1,0-2,5	10-44	9-24	-	3607853	-

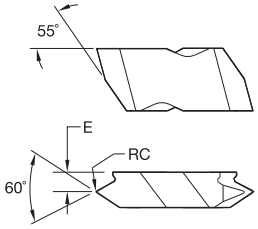
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTC-E





American
UN-External



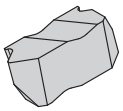
● first choice
○ alternate choice

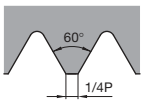
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTC3R16E	0,19	3,76	3	–	–	16	–	-	3636557	-
NTC3R14E	0,22	3,76	3	–	–	14	–	3636554	-	-
NTC3R12E	0,25	3,76	3	–	–	12	–	3636549	3636562	-

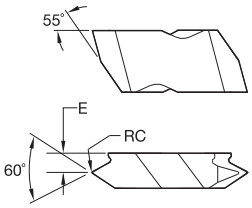
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTC-I





American
UN-Internal



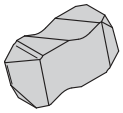
● first choice
○ alternate choice

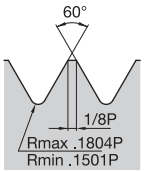
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
left hand										
NTC3L12I	0,10	3,76	3	–	–	–	12	-	3636556	-

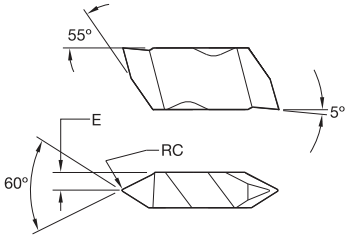
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NJP





UNJ External



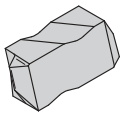
● first choice
○ alternate choice

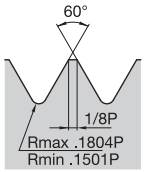
P		●	●	
M		●	●	
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NJP3014R12	0,33	2,49	3	–	–	12	–	'	3607850	'

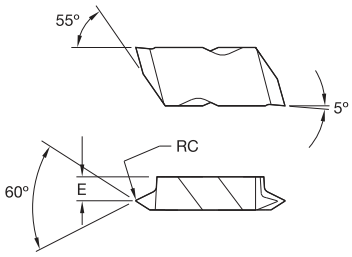
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NJK





UNJ External



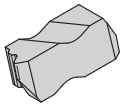
● first choice
○ alternate choice

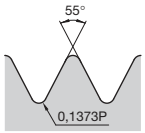
P		●	●	
M		●	●	
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NJK3008R20	0,20	3,58	3	–	–	20	–	3607648	'	'

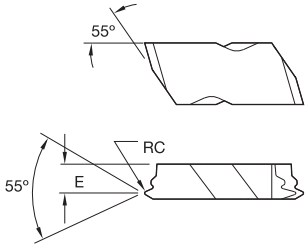
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NWC-E





Whitworth BSW, BSP-External



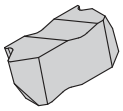
● first choice
○ alternate choice

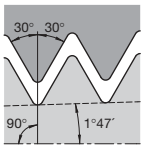
P		●	●
M		●	●
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○

catalogue number	RC	E	SSC	TPI	TPF	TN6010	TN6025	THM
right hand								
NWC3R14E	0,24	3,43	3	14	—	'	3811638	'
NWC3R11E	0,30	3,43	3	11	—	'	3811639	'

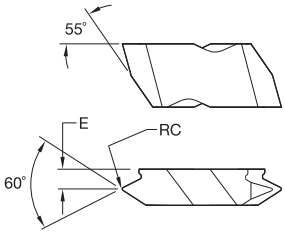
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NDC-RD





API Round



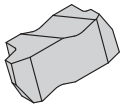
● first choice
○ alternate choice

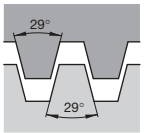
P		●	●
M		●	●
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○

catalogue number	RC	E	SSC	TPI	TPF	TN6010	TN6025	THM
right hand								
NDC38RDR75	0,43	3,18	3	8	.750	'	3636558	'
left hand								
NDC310RDL75	0,36	3,18	3	10	.750	'	3636565	'
NDC38RDL75	0,43	3,18	3	8	.750	'	3636559	'

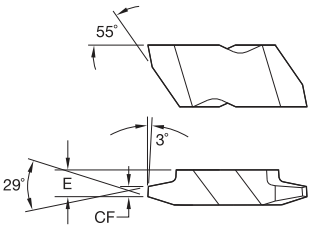
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NA





ACME



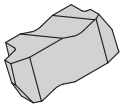
● first choice
○ alternate choice

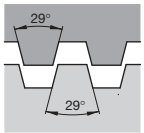
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	CF	E	SSC	TPI	TN6010	TN6025	THM
right hand							
NA3R8	1,04	3,79	3	8	-	3607854	-
NA3R6	1,44	3,79	3	6	-	3607851	-
NA3R4	2,22	3,38	3	4	-	3607848	-
NA4R4	2,22	5,13	4	4	-	3636566	-
NA6R3	3,01	7,19	6	3	-	3636564	-
NA6R2	4,58	7,19	6	2	-	3636567	-
left hand							
NA3L8	1,04	3,79	3	8	-	3607855	-
NA3L6	1,44	3,79	3	6	-	3607847	-
NA3L4	2,22	3,38	3	4	-	3607842	-
NA4L4	2,22	5,13	4	4	-	3636560	-
NA6L3	3,01	7,19	6	3	-	3636561	-
NA6L2	4,58	7,19	6	2	-	3636568	-

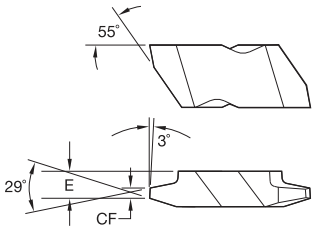
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NAS





Stub ACME



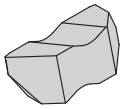
● first choice
○ alternate choice

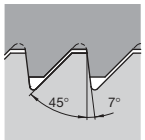
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	CF	E	SSC	TPI	TN6010	TN6025	THM
right hand							
NAS3R8	1,21	3,79	3	8	-	3607856	-
left hand							
NAS3L8	1,21	3,79	3	8	-	3607845	-
NAS3L6	1,66	3,79	3	6	-	3607829	-

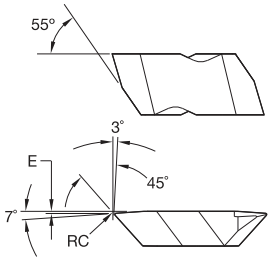
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTB-B





American
Buttress-Pull



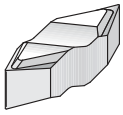
● first choice
○ alternate choice

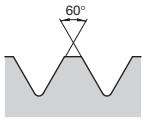
P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

catalogue number	RC	E	SSC	TPI	TPF	TN6010	TN6025	THM
left hand								
NTB3LB	0,17	0,31	3	8-16	—	-	3636563	-

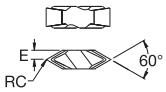
NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • NTU





Partial Profile 60°
External



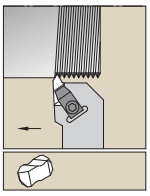
● first choice
○ alternate choice

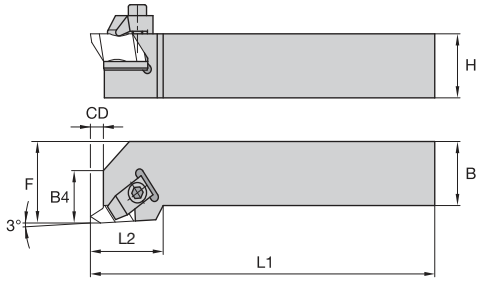
P		●	●	
M		●	●	
K		●	○	●
N		●	○	○
S		●	●	○
H		○	○	

catalogue number	RC	E	SSC	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTU4R	0,11	3,18	4U	1,25-6,25	–	4-20	–	-	3811640	-

NOTE: SSC = To correspond with the SSC on the toolholder.

Integral Toolholders • NS • Metric



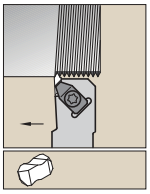


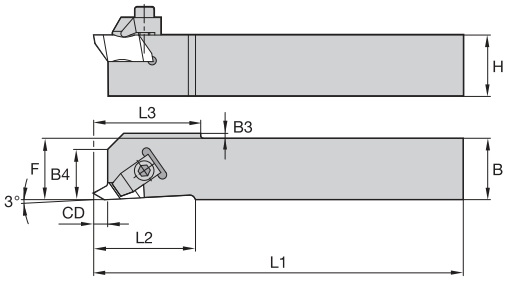
Right Hand Tool

order number	catalogue number	SSC	H	B	F	L1	L2	B4	CD	gage insert
right hand										
3632147	NSR062	2	10	10	14	64	19	9	3,5	N.2R
3641660	NSR1212F2	2	12	12	16	80	19	9	3,5	N.2R
3639035	NSR082V	2	13	13	19	89	19	9	3,5	N.2R
3636542	NSR1616H2	2	16	16	20	100	19	9	3,5	N.2R
3639026	NSR122B	2	19	19	25	114	19	9	3,5	N.2R
3638589	NSR2020K2	2	20	20	25	125	19	9	3,5	N.2R
3638590	NSR2525M2	2	25	25	32	150	19	9	3,5	N.2R
3639025	NSR162C	2	25	25	32	127	19	9	3,5	N.2R
3639027	NSR123A	3	19	19	25	102	32	13	5,3	N.3R
3639023	NSR123B	3	19	19	25	114	32	13	5,3	N.3R
3638588	NSR2020K3	3	20	20	25	125	32	13	5,3	N.3R
3636536	NSR2525M3	3	25	25	32	150	32	13	5,3	N.3R
3638592	NSR163C	3	25	25	32	127	32	13	5,3	N.3R
3638591	NSR163D	3	25	25	32	152	32	13	5,3	N.3R
3639028	NSR203D	3	32	32	38	152	32	13	5,3	N.3R
3641666	NSR3232P3	3	32	32	40	170	32	13	5,3	N.3R
3636540	NSR2525M4	4	25	25	32	150	35	14	7,5	N.4R
3641669	NSR3232P4	4	32	32	40	170	35	14	7,5	N.4R
left hand										
3632145	NSL122B	2	19	19	25	114	19	9	3,5	N.2L
3639045	NSL2020K2	2	20	20	25	125	19	9	3,5	N.2L
3639047	NSL2525M2	2	25	25	32	150	19	9	3,5	N.2L
3632138	NSL162C	2	25	25	32	127	19	9	3,5	N.2L
3632152	NSL123A	3	19	19	25	102	32	13	5,3	N.3L
3639032	NSL123B	3	19	19	25	114	32	13	5,3	N.3L
3639046	NSL2020K3	3	20	20	32	125	32	13	5,3	N.3L
3636539	NSL2525M3	3	25	25	32	150	32	13	5,3	N.3L
3639029	NSL163C	3	25	25	32	127	32	13	5,3	N.3L
3639024	NSL163D	3	25	25	32	152	32	13	5,3	N.3L
3639037	NSL203D	3	32	32	38	152	32	13	5,3	N.3L
3636544	NSL2525M4	4	25	25	32	150	35	14	7,5	N.4L

NOTE: F dimension measured over sharp point of insert.

Integral Toolholders • NAS • Metric

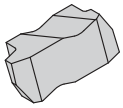


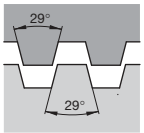


order number	catalogue number	SSC	H	B	F	L1	L2	B4	CD	gage insert
right hand										
3641662	**NASR1212M2Q**	2	12	12	12	150	19	9	3,5	N.2R
3639048	**NASR1616K3Q**	3	16	16	16	125	32	12	5,3	N.3R

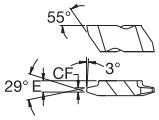
NOTE: F dimension measured over sharp point of insert.

NAS





Stub ACME



● first choice
○ alternate choice

P	●	●	
M	●	●	
K	●	○	●
N	●	○	○
S	●	●	○
H	○	○	

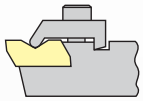
catalogue number	CF	E	SSC	TPI	TN6010	TN6025	THM
right hand							
NAS3R8	1,21	3,79	–	8	-	3607856	-
left hand							
NAS3L8	1,21	3,79	–	8	-	3607845	-
NAS3L6	1,66	3,79	–	6	-	3607829	-

NOTE: SSC = To correspond with the SSC on the toolholder.

TopThread Holder • Catalog Numbering System

N — Insert Holding Method

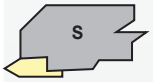
N — TopThread



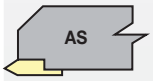
S — Insert Mounting Location

End mount

Side mount, offset

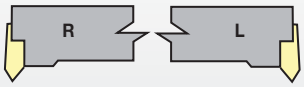


Side mount, no offset

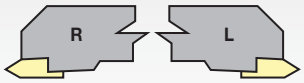


R — Hand of Tool

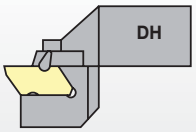
End mount



Side mount



Drop Head



2525 — Shank Size

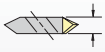
Shank height and width in mm and holder

M — Tool Length

L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
special length	x

4 — Insert Size

W1



insert size	W1
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

Qualified Holder

Q — Qualified holder

TopThread Boring Bar • Catalog Numbering System

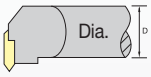
A	25	R	N	N	T	0	R	2
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle 0 = 0°	Hand of Tool	Insert Size

Bar Type

Steel with coolant

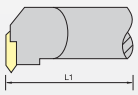
Bar Diameter

Bar in millimeters



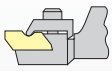
Bars

K = 125,0mm
M = 150,0mm
Q = 180,0mm
R = 200,0mm
S = 250,0mm
T = 300,0mm
U = 350,0mm



Insert Holding Method

N – TopThread*

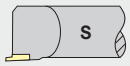


*Proprietary standard only.

Insert Location

End mount

Side mount



Hand of Tool

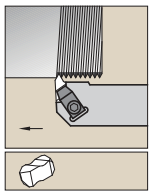
Right hand

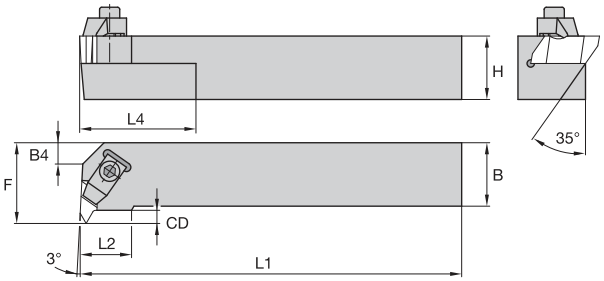
Left hand

Insert Size

insert size	W1
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

Integral Toolholders • NE • Metric



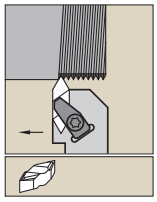


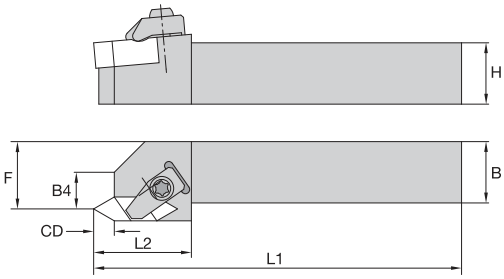
Right Hand Tool

order number	catalogue number	SSC	H	B	F	L1	L2	B4	CD	gage insert
right hand										
3641658	**NER2020K2**	2	20	20	25	125	15	6	3,5	N.2L
3641665	**NER2525M2**	2	25	25	32	150	15	12	3,5	N.2L
3636541	**NER2525M3**	3	25	25	32	150	22	—	5,3	N.3L
3641672	**NER2525M4**	4	25	25	35	150	24	—	7,5	N.4L
left hand										
3641677	**NEL2020K2**	2	20	20	25	125	15	6	3,5	N.2R
3641676	**NEL2525M2**	2	25	25	32	150	15	12	3,5	N.2R
3636543	**NEL2525M3**	3	25	25	32	150	22	—	5,3	N.3R
3641668	**NEL2525M4**	4	25	25	35	150	24	—	7,5	N.4R

NOTE: F dimension measured over sharp point of insert.
SSC = To correspond with the SSC on the insert.

Integral Toolholders • NSU • Metric



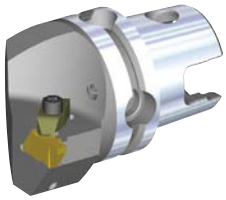


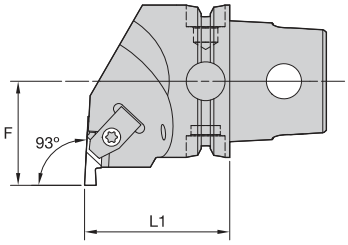
Right Hand Tool

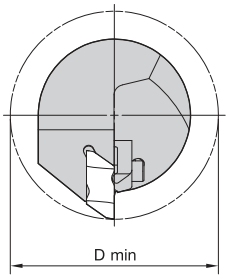
order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert
right hand									
3851387	**NSUR2525M4D**	25	25	28	150	32	13	6,1	NTU4R

NOTE: F dimension shown over N-style gage insert.
NSU toolholders only for NTU4 threading inserts.

Cutting Units • KM40TS • NE93° • Metric

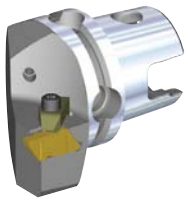


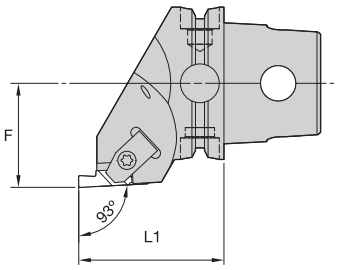


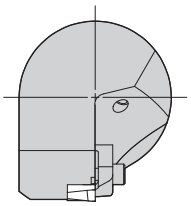


order number	catalogue number	L1 mm	L1 in	F mm	F in	D min mm	D min in	gage insert	kg	lbs
right hand										
3902285	**KM40TSNER2**	40	1.575	27	1.063	54	2.126	NG2L	0,30	.66
3902286	**KM40TSNER3**	40	1.575	27	1.063	54	2.126	NG3L	0,30	.67
3902287	**KM40TSNER4**	40	1.575	27	1.063	54	2.126	NG4L	0,30	.65
left hand										
3902132	**KM40TSNEL2**	40	1.575	27	1.063	54	2.126	NG2R	0,30	.66
3902283	**KM40TSNEL3**	40	1.575	27	1.063	54	2.126	NG3R	0,30	.67
3902284	**KM40TSNEL4**	40	1.575	27	1.063	54	2.126	NG4R	0,30	.65

Cutting Units • KM40TS • NS93° • Metric

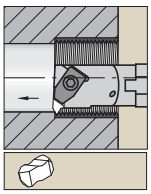




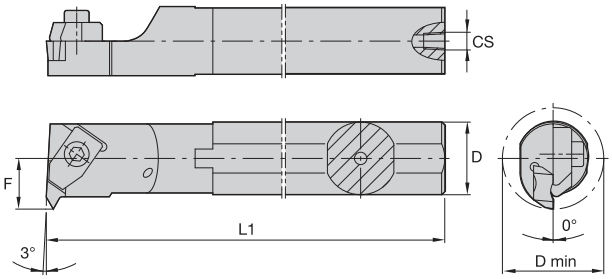


order number	catalogue number	L1 mm	L1 in	F mm	F in	gage insert	kg	lbs
right hand								
3902293	**KM40TSNSR2**	40	1.575	27	1.063	NG2R	0,32	.70
3902294	**KM40TSNSR3**	47	1.850	27	1.063	NG3R	0,32	.71
3902295	**KM40TSNSR4**	47	1.850	27	1.063	NG4R	0,30	.66
left hand								
3902290	**KM40TSNSL2**	40	1.575	27	1.063	NG2L	0,32	.70
3902291	**KM40TSNSL3**	47	1.850	27	1.063	NG3L	0,33	.72
3902292	**KM40TSNSL4**	47	1.850	27	1.063	NG4L	0,30	.66

Integral I.D. Threading Boring Bars • A-NNT • Metric



Steel shank with through coolant.

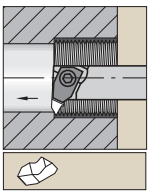


Right Hand Tool

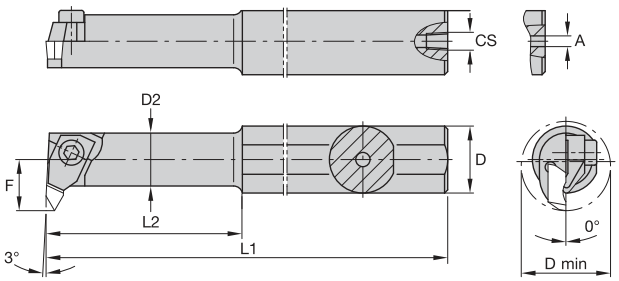
order number	catalogue number	SSC	D	D min	L1	F	CS	gage insert
right hand								
3641644	**A12MNNTOR2**	2	12	18,5	150	11	1/16-27 NPT	NG2L
3641643	**A16MNNTOR2**	2	16	22,0	150	11	1/8-27 NPT	N.2L
3641645	**A20QNNTOR2**	2	20	26,0	180	13	1/8-27 NPT	N.2L
3641651	**A25RNNTOR2**	2	25	34,0	200	17	1/4-18 NPT	N.2L
3641622	**A25RNNTOR3**	3	25	34,0	200	17	1/4-18 NPT	N.3L
3641646	**A32SNNTOR3**	3	32	44,0	250	22	1/4-18 NPT	N.3L
3641653	**A40TNNTOR3**	3	40	54,0	300	27	1/4-18 NPT	N.3L
3641654	**A40TNNTOR4**	4	40	54,0	300	27	1/4-18 NPT	N.4L
left hand								
3641655	**A12MNNTOL2**	2	12	18,5	150	11	1/16-27 NPT	NG2R
3641649	**A16MNNTOL2**	2	16	22,0	150	11	1/8-27 NPT	N.2R
3641652	**A20QNNTOL2**	2	20	26,0	180	13	1/8-27 NPT	N.2R
3641657	**A25RNNTOL2**	2	25	34,0	200	17	1/4-18 NPT	N.2R
3641650	**A25RNNTOL3**	3	25	34,0	200	17	1/4-18 NPT	N.3R
3641656	**A32SNNTOL3**	3	32	44,0	250	22	1/4-18 NPT	N.3R
3641659	**A40TNNTOL3**	3	40	54,0	300	27	1/4-18 NPT	N.3R

NOTE: F dimension measured over sharp point of insert.
SSC = To correspond with the SSC on the insert.

Integral I.D. Threading Boring Bars • A-NNT-1 • Metric



Necked steel shank with through coolant.

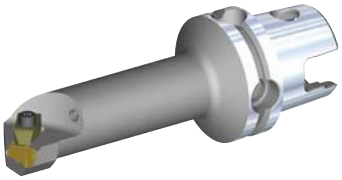


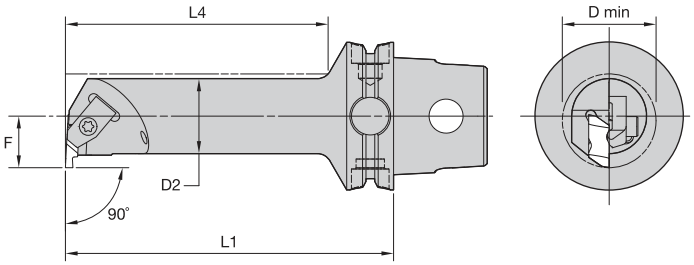
Right Hand Tool

order number	catalogue number	SSC	D	D min	D2	L1	L2	F	A	CS	gage insert
right hand											
3641647	**A12MNNTOR1**	1	12	11,5	8,7	150	31	7	4,0	1/16-27 NPT	N.1L
3641648	**A10KNNTOR1**	1	10	11,5	10,0	125	—	7	3,2	—	NG1L

NOTE: F dimension measured over sharp point of insert.
SSC = To correspond with the SSC on the insert.

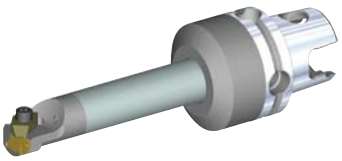
Cutting Units • KM40TS • Steel • NE90° • Metric

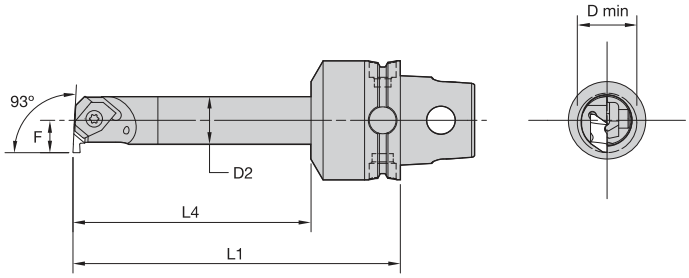




order number	catalogue number	D2 mm	D2 in	D min mm	D min in	F mm	F in	L4 mm	L4 in	L1 mm	L1 in	gage insert	kg	lbs
right hand														
3955481	KM40TSS12ENER2	12	.472	19	.73	11	.433	42	1.65	70	2.756	NG2L	0,27	.58
3955483	KM40TSS16FNER2	16	.630	20	.79	11	.433	56	2.21	80	3.150	NG2L	0,28	.62
3955485	KM40TSS20GNER2	20	.787	25	.98	13	.512	70	2.76	90	3.543	NG2L	0,35	.76
3955487	KM40TSS25ENER2	25	.984	32	1.26	17	.669	55	2.17	70	2.756	NG2L	0,34	.75
3955491	KM40TSS25ENER3	25	.984	34	1.34	17	.669	55	2.17	70	2.756	NG3L	0,35	.77
3955489	KM40TSS25HNER2	25	.984	32	1.26	17	.669	75	2.95	100	3.937	NG2L	0,49	1.08
3955493	KM40TSS25HNER3	25	.984	34	1.34	17	.669	75	2.95	100	3.937	NG3L	0,49	1.09
3955497	KM40TSS32GNER3	32	1.260	40	1.57	22	.866	76	2.99	90	3.543	NG3L	0,55	1.21
3955495	KM40TSS32JNER3	32	1.260	40	1.57	22	.866	96	3.78	110	4.331	NG3L	0,67	1.48
left hand														
3955480	KM40TSS12ENEL2	12	.472	19	.73	11	.433	42	1.65	70	2.756	NG2R	0,27	.59
3955482	KM40TSS16FNEL2	16	.630	20	.79	11	.433	56	2.21	80	3.150	NG2R	0,28	.62
3955484	KM40TSS20GNEL2	20	.787	25	.98	13	.512	70	2.76	90	3.543	NG2R	0,35	.76
3955486	KM40TSS25ENEL2	25	.984	32	1.26	17	.669	55	2.17	70	2.756	NG2R	0,34	.75
3955490	KM40TSS25ENEL3	25	.984	34	1.34	17	.669	55	2.17	70	2.756	NG3R	0,35	.77
3955488	KM40TSS25HNEL2	25	.984	32	1.26	17	.669	75	2.95	100	3.937	NG2R	0,49	1.08
3955492	KM40TSS25HNEL3	25	.984	34	1.34	17	.669	75	2.95	100	3.937	NG3R	0,49	1.09
3955496	KM40TSS32GNEL3	32	1.260	40	1.57	22	.866	76	2.99	90	3.543	NG3R	0,55	1.21
3955494	KM40TSS32JNEL3	32	1.260	40	1.57	22	.866	96	3.78	110	4.331	NG3R	0,67	1.48

Cutting Units • KM40TS • Carbide • NE90° • Metric





order number	catalogue number	D2 mm	D2 in	D min mm	D min in	F mm	F in	L4 mm	L4 in	L1 mm	L1 in	gage insert	kg	lbs
right hand														
3951836	KM40TSE16JNER2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2L	0,41	.90
left hand														
3951835	KM40TSE16JNEL2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2R	0,41	.90

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With unmatched tooling technology, you can trust WIDIA TopThread tools for all of your threading and grooving needs.

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The WIDIA™ high-performance carbide grades, coupled with our rigid TopThread clamping design, offer the metalworking industry optimum threading productivity.

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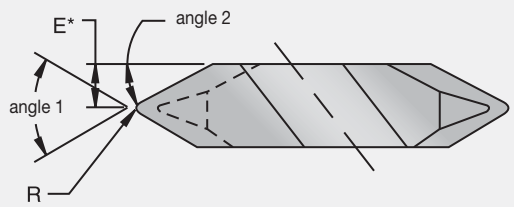
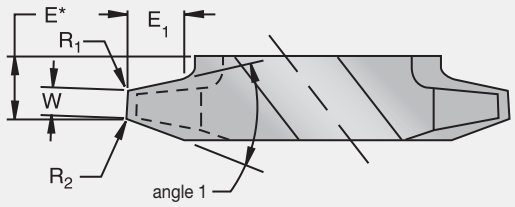
• A large number of high-performance carbide grades are available to optimize your productivity. The option of producing standard insert styles in non-standard carbide grades allows you to optimize tool life performance.

style C2 RH shown



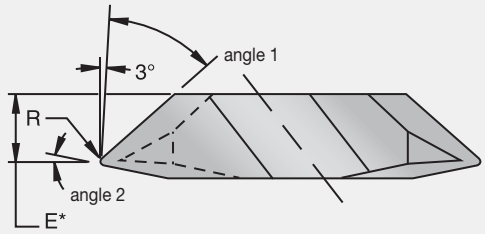
*to theoretical sharp point

style C3 RH shown



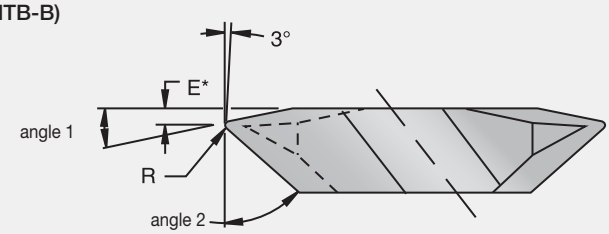
*to theoretical sharp point

style C4 (NTB-A) RH shown



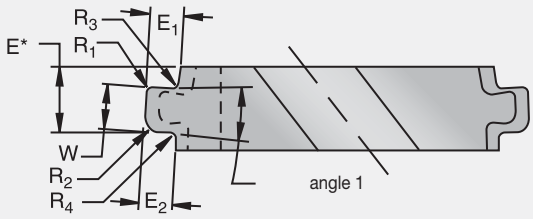
*to theoretical sharp point

style C5 (NTB-B) RH shown



*to theoretical sharp point

style C6 RH shown

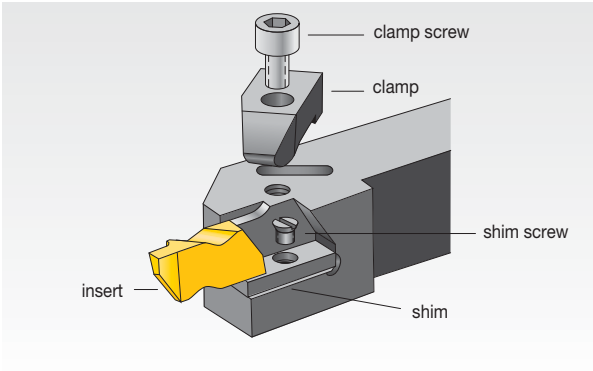


*to theoretical sharp point

NOTE: Right-hand inserts shown; left-hand inserts are also available.

Hardware

TopThread and TopGroove Toolholders and Boring Bars



insert size and style	clamp	clamp screw	shim	shim screw
NG-1L	CM-109	S-304	–	–
NG-2R	CM-182	S-310	–	–
NG-2L	CM-183	S-310	–	–
NG-2R	CM-74	S-310	–	–
NG-2L	CM-75	S-310	–	–
NG-3R	CM-184	S-412	–	–
NG-3L	CM-185	S-412	–	–
NG-3R	CM-72	S-412	–	–
NG-3L	CM-73	S-412	–	–
NG-3R*	CM-78	S-412	–	–
NG-3L*	CM-70	S-412	–	–
NG-4R	CM-72	S-412	SM-420	SL-344
NG-4L	CM-73	S-412	SM-420	SL-344
NG-5R	CM-80	S-352	–	–
NG-5L	CM-81	S-352	–	–
NG-6R	CM-120	S-412	SM-416	S-111
NG-6L	CM-121	S-412	SM-416	S-111
NG-8R	CM-144	S-422	SM-419	S-112
NG-8L	CM-145	S-422	SM-419	S-112
NG-8R**	CM-144	S-422	SM-427	S-111
NG-8L**	CM-145	S-422	SM-427	S-111
TopGroove relief grooving				
NU-3125R	CM-72	S-412	–	–
NU-3125L	CM-73	S-412	–	–
NU-3125R**	CM-72	S-618	–	–
NU-3125L**	CM-73	S-618	–	–

**25mm diameter boring head.*
***Boring head.*

Laydown Threading

O.D, I.D. Threading

The Laydown Threading System offers an extensive range of inserts and toolholders, the ideal for all of threading requirements.

- Four insert sizes available to cover a wide range of thread-making operations.
- Ideal for high-helix/multi-start threads and single-point threading in small-diameter bores.
- Maximized tool life and low-profile design for unhindered chip flow and superior performance.
- Precision ground inserts to provide accurate thread forms and indexing.
- TN6025™ premium PVD TiAlN-coated grade outperforms conventional PVD grades.
- Partial- and full-profile insert options available for all common thread forms.

LAYDOWN THREADING

RELIABLE

With the WIDIA™ Laydown Threading System, you experience reliable countersunk screw locking for unhindered chip flow and precise insert positioning accuracy.

PRODUCTIVE

Laydown insert technology, with its wide range of available tools and inserts, guarantees increased tool life, minimized built-up edges, and precise cuts of most common materials.

EXTERNAL AND INTERNAL THREADING

INSERTS

FIRST CHOICE	INSERT STYLE	SPEED SELECTION — M/MIN	MATERIALS
TN6025	Precision ground	40–200 (130–650)	P
		40–135 (130–450)	M
		60–145 (200–475)	K
		50–360 (160–1150)	N
		10–100 (35–330)	S

APPLICATIONS

THREADING

I.D. INTERNAL THREADING

INDUSTRY

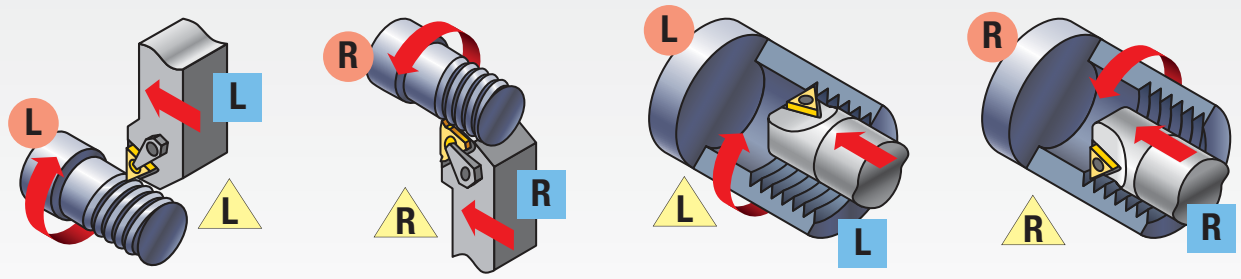
Insert Selection Guide

Step 1 • Select Threading Method and Hand of Tooling

Required Information:
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.

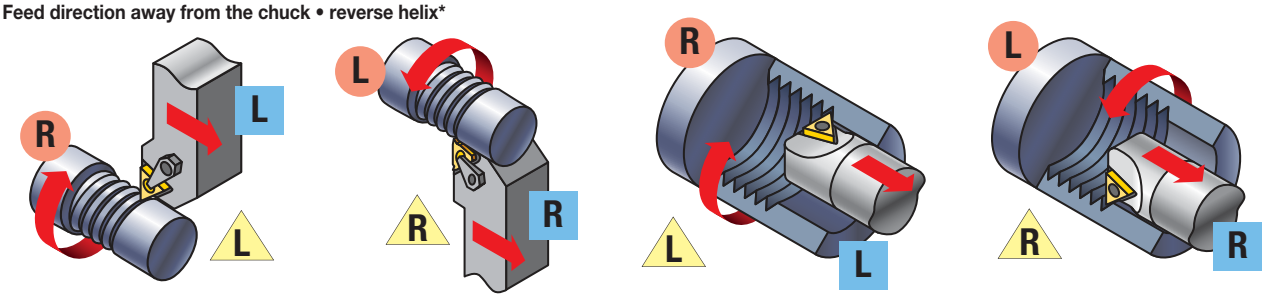
hand of thread | hand of toolholder | hand of insert

Feed direction toward the chuck • standard helix • RECOMMENDED



external left-hand thread | external right-hand thread | internal left-hand thread | internal right-hand thread

Feed direction away from the chuck • reverse helix*



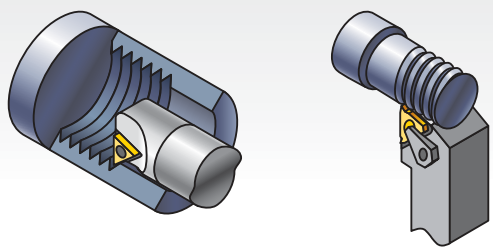
external right-hand thread | external left-hand thread | internal right-hand thread | internal left-hand thread

**Negative shim required*

Step 2 • Select Holder from Catalog Page

Required Information:
- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

Select the appropriate holder for the insert size and hand:



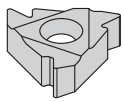
The insert size must match the gage insert size of your toolholder selection:

catalogue number	gage insert	minimum bore diameter	shim
S0812LSER2	2IRA60	16,5mm	–
S2020LSER3	3IR...	36,8mm	SM-YI3

Insert Selection Guide

Step 3 • Choose Insert for Application

- Select cresting inserts for fully controlled thread form including diameter.
- Cresting inserts eliminate the need for deburring and are optimized for the best tool life at that pitch.
- Non-cresting partial profile inserts offer the flexibility to cut a variety of thread pitches with one insert.
- Note insert size for toolholder selection.



insert size	catalogue number	TN6025
11	2IRA60	•
16	3IRAG60	•

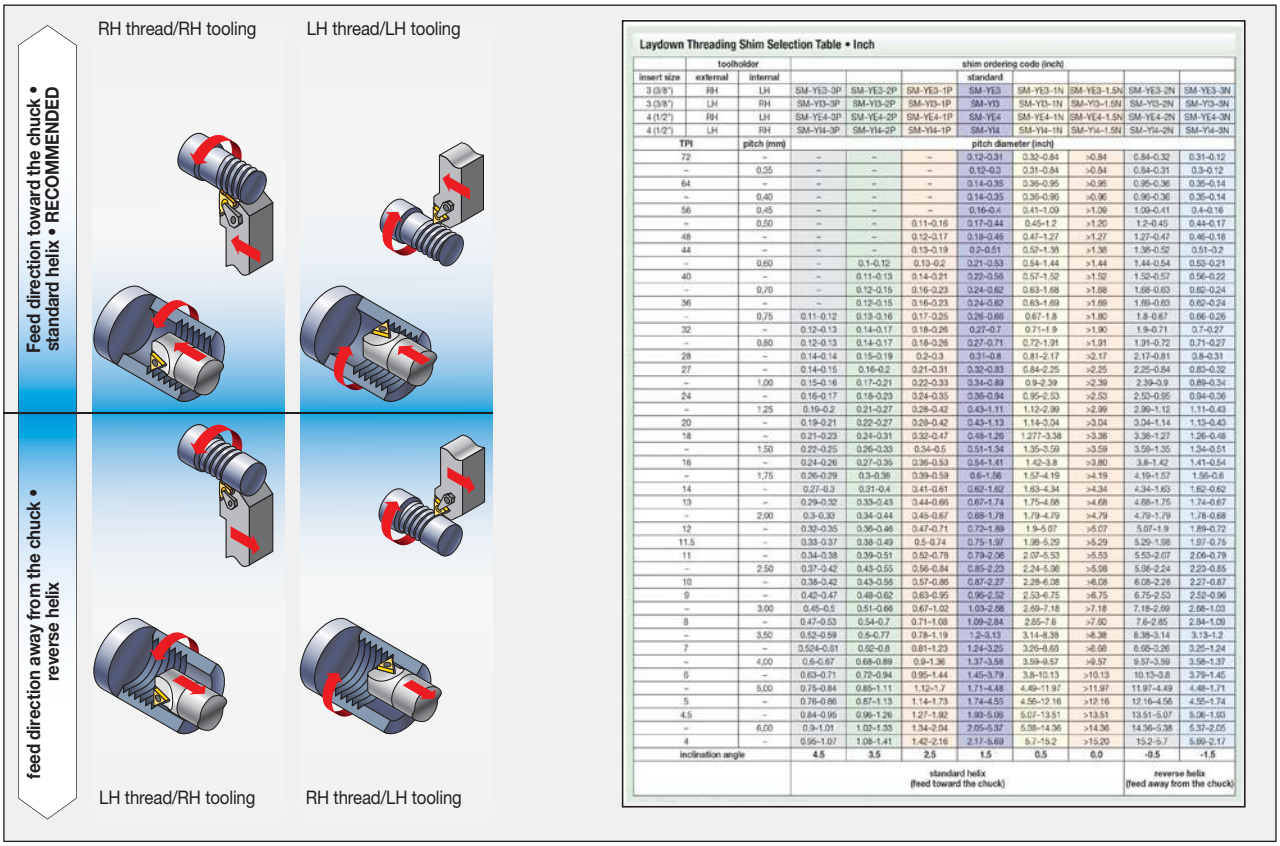
See threading insert overview on page E466.

Step 4 • Select Appropriate Shim

Required Information:

- Thread form (TPI or pitch).
- Pitch diameter.
- Helix method (hand of tool, feed direction, hand of thread).
- Number of starts.

Select the proper shim: SMYE... for external RH or internal LH
SMYI... for internal RH or external LH



Laydown Threading Shim Selection Table • Inch

	toolholder		shim ordering code (inch)							
insert size	external	internal				standard				
3 (3/8")	RH	LH	SM-YE3-3P	SM-YE3-2P	SM-YE3-1P	SM-YE3	SM-YE3-1N	SM-YE3-1.5N	SM-YE3-2N	SM-YE3-3N
3 (3/8")	LH	RH	SM-YI3-3P	SM-YI3-2P	SM-YI3-1P	SM-YI3	SM-YI3-1N	SM-YI3-1.5N	SM-YI3-2N	SM-YI3-3N
4 (1/2")	RH	LH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1.5N	SM-YE4-2N	SM-YE4-3N
4 (1/2")	LH	RH	SM-YI4-3P	SM-YI4-2P	SM-YI4-1P	SM-YI4	SM-YI4-1N	SM-YI4-1.5N	SM-YI4-2N	SM-YI4-3N
TPI		pitch (mm)	pitch diameter (inch)							
72		–	–	–	–	0.12–0.31	0.32–0.84	>0.84	0.84–0.32	0.31–0.12
–		0.35	–	–	–	0.12–0.3	0.31–0.84	>0.84	0.84–0.31	0.3–0.12
64		–	–	–	–	0.14–0.35	0.36–0.95	>0.95	0.95–0.36	0.35–0.14
–		0.40	–	–	–	0.14–0.35	0.36–0.96	>0.96	0.96–0.36	0.35–0.14
56		0.45	–	–	–	0.16–0.4	0.41–1.09	>1.09	1.09–0.41	0.4–0.16
–		0.50	–	–	0.11–0.16	0.17–0.44	0.45–1.2	>1.20	1.2–0.45	0.44–0.17
48		–	–	–	0.12–0.17	0.18–0.46	0.47–1.27	>1.27	1.27–0.47	0.46–0.18
44		–	–	–	0.13–0.19	0.2–0.51	0.52–1.38	>1.38	1.38–0.52	0.51–0.2
–		0.60	–	0.1–0.12	0.13–0.2	0.21–0.53	0.54–1.44	>1.44	1.44–0.54	0.53–0.21
40		–	–	0.11–0.13	0.14–0.21	0.22–0.56	0.57–1.52	>1.52	1.52–0.57	0.56–0.22
–		0.70	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.68	>1.68	1.68–0.63	0.62–0.24
36		–	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.69	>1.69	1.69–0.63	0.62–0.24
–		0.75	0.11–0.12	0.13–0.16	0.17–0.25	0.26–0.66	0.67–1.8	>1.80	1.8–0.67	0.66–0.26
32		–	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.7	0.71–1.9	>1.90	1.9–0.71	0.7–0.27
–		0.80	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.71	0.72–1.91	>1.91	1.91–0.72	0.71–0.27
28		–	0.14–0.14	0.15–0.19	0.2–0.3	0.31–0.8	0.81–2.17	>2.17	2.17–0.81	0.8–0.31
27		–	0.14–0.15	0.16–0.2	0.21–0.31	0.32–0.83	0.84–2.25	>2.25	2.25–0.84	0.83–0.32
–		1.00	0.15–0.16	0.17–0.21	0.22–0.33	0.34–0.89	0.9–2.39	>2.39	2.39–0.9	0.89–0.34
24		–	0.16–0.17	0.18–0.23	0.24–0.35	0.36–0.94	0.95–2.53	>2.53	2.53–0.95	0.94–0.36
–		1.25	0.19–0.2	0.21–0.27	0.28–0.42	0.43–1.11	1.12–2.99	>2.99	2.99–1.12	1.11–0.43
20		–	0.19–0.21	0.22–0.27	0.28–0.42	0.43–1.13	1.14–3.04	>3.04	3.04–1.14	1.13–0.43
18		–	0.21–0.23	0.24–0.31	0.32–0.47	0.48–1.26	1.277–3.38	>3.38	3.38–1.27	1.26–0.48
–		1.50	0.22–0.25	0.26–0.33	0.34–0.5	0.51–1.34	1.35–3.59	>3.59	3.59–1.35	1.34–0.51
16		–	0.24–0.26	0.27–0.35	0.36–0.53	0.54–1.41	1.42–3.8	>3.80	3.8–1.42	1.41–0.54
–		1.75	0.26–0.29	0.3–0.38	0.39–0.59	0.6–1.56	1.57–4.19	>4.19	4.19–1.57	1.56–0.6
14		–	0.27–0.3	0.31–0.4	0.41–0.61	0.62–1.62	1.63–4.34	>4.34	4.34–1.63	1.62–0.62
13		–	0.29–0.32	0.33–0.43	0.44–0.66	0.67–1.74	1.75–4.66	>4.66	4.66–1.75	1.74–0.67
–		2.00	0.3–0.33	0.34–0.44	0.45–0.67	0.68–1.78	1.79–4.79	>4.79	4.79–1.79	1.78–0.68
12		–	0.32–0.35	0.36–0.46	0.47–0.71	0.72–1.89	1.9–5.07	>5.07	5.07–1.9	1.89–0.72
11.5		–	0.33–0.37	0.38–0.49	0.5–0.74	0.75–1.97	1.98–5.29	>5.29	5.29–1.98	1.97–0.75
11		–	0.34–0.38	0.39–0.51	0.52–0.78	0.79–2.06	2.07–5.53	>5.53	5.53–2.07	2.06–0.79
–		2.50	0.37–0.42	0.43–0.55	0.56–0.84	0.85–2.23	2.24–5.98	>5.98	5.98–2.24	2.23–0.85
10		–	0.38–0.42	0.43–0.56	0.57–0.86	0.87–2.27	2.28–6.08	>6.08	6.08–2.28	2.27–0.87
9		–	0.42–0.47	0.48–0.62	0.63–0.95	0.96–2.52	2.53–6.75	>6.75	6.75–2.53	2.52–0.96
–		3.00	0.45–0.5	0.51–0.66	0.67–1.02	1.03–2.68	2.69–7.18	>7.18	7.18–2.69	2.68–1.03
8		–	0.47–0.53	0.54–0.7	0.71–1.08	1.09–2.84	2.85–7.6	>7.60	7.6–2.85	2.84–1.09
–		3.50	0.52–0.59	0.6–0.77	0.78–1.19	1.2–3.13	3.14–8.38	>8.38	8.38–3.14	3.13–1.2
7		–	0.524–0.61	0.62–0.8	0.81–1.23	1.24–3.25	3.26–8.69	>8.68	8.68–3.26	3.25–1.24
–		4.00	0.6–0.67	0.68–0.89	0.9–1.36	1.37–3.58	3.59–9.57	>9.57	9.57–3.59	3.58–1.37
6		–	0.63–0.71	0.72–0.94	0.95–1.44	1.45–3.79	3.8–10.13	>10.13	10.13–3.8	3.79–1.45
–		5.00	0.75–0.84	0.85–1.11	1.12–1.7	1.71–4.48	4.49–11.97	>11.97	11.97–4.49	4.48–1.71
5		–	0.76–0.86	0.87–1.13	1.14–1.73	1.74–4.55	4.56–12.16	>12.16	12.16–4.56	4.55–1.74
4.5		–	0.84–0.95	0.96–1.26	1.27–1.92	1.93–5.06	5.07–13.51	>13.51	13.51–5.07	5.06–1.93
–		6.00	0.9–1.01	1.02–1.33	1.34–2.04	2.05–5.37	5.38–14.36	>14.36	14.36–5.38	5.37–2.05
4		–	0.95–1.07	1.08–1.41	1.42–2.16	2.17–5.69	5.7–15.2	>15.20	15.2–5.7	5.69–2.17
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			standard helix (feed toward the chuck)						reverse helix (feed away from the chuck)	

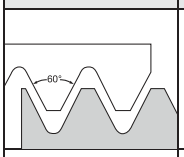
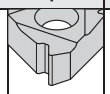
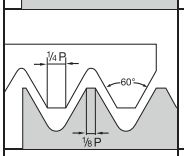
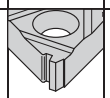
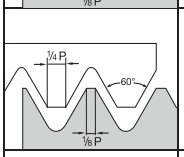
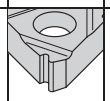
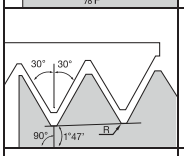
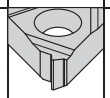
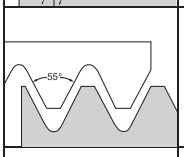
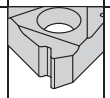
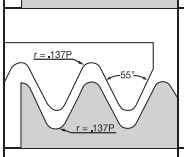
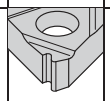
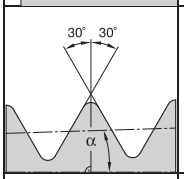
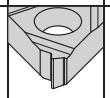
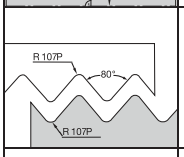
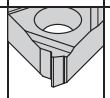
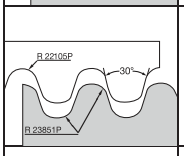
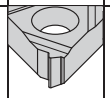
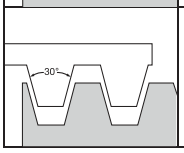
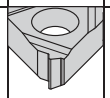
If recommended shim is different from shim supplied with toolholder, order shim separately.
NOTE: Optimize your threading operation by using the proper infeed angle and the recommended infeed values. See the Technical Section on pages E502–E503. Also see detailed shim selection information on pages E514–E515.

Step 5 • Select Grade and Speed

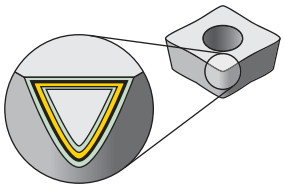
Recommendations for Grade and Speed Selection — m/min (SFM)

workpiece material	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys
insert style	precision ground				
first choice	TN6025	TN6025	TN6025	TN6025	TN6025
	40–200 (130–650)	40–135 (130–450)	60–145 (200–475)	50–360 (160–1150)	10–100 (35–330)

Insert Overview

style			thread profile	standard	tolerance class	cresting	application	page(s)
		flat top						
	60		Partial profile 60°	–	–	N	General use for 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	**E470–E471**
	ISO		Metric ISO	ISO R262, DIN 13	6g/6H	Y	Widely used metric 60° V-form for all industries.	**E472–E475**
	UN		American UN	ANSI B1.1:74	2A/2B	Y	Widely used inch-based 60° V-form for all industries.	**E476–E477**
	NPT		NPT	ANSI/ASME B1.20.1S1983	Standard NPT	N	National Pipe Thread standard 60° thread form for pipe fittings.	**E478**
	55		Partial profile 55°	–	–	N	General use for 55° thread forms such as Whitworth, BSW, and BSP where non-cresting inserts are desired to cut a variety of pitches.	**E479–E489**
	W		Whitworth, BSW, BSF, BSP	BS 84:1956, ISO 228/1:1982, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections.	**E481–E482**
	API-RD		API round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry, including 8 and 10 round forms.	**custom solution**
	PG		PG	DIN 404B0		Y	80° steel conduit thread.	**custom solution**
	RD		Round	DIN 405	7e/7H	Y	Round thread form for tube fittings in the chemical and food industries.	**E482–E483**
	TR		Trapez	DIN 103	7e/7H	N	30° truncated metric thread form for motion applications.	**E484–E485**

Grades and Grade Descriptions

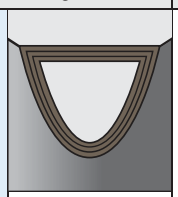


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

- Reduce cycle times — high speed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
TN6025	 HC-P25	PVD-TiAlN nano-multilayer coated carbide. General-purpose machining for steels, stainless steels, cast irons, non-ferrous materials, and difficult-to-machine materials. Recommended at low to medium cutting speeds when higher toughness is required.	P									
			M									
			K									
			N									
			S									

Laydown Threading Thread Form Guide

- All Laydown Threading inserts are precision ground to provide accurate thread forms and indexing.
- Both cresting and non-cresting partial profile inserts are specifically designed for either external or internal threading operations.
- Cresting inserts provide a fully controlled thread form, including major, minor, root, and crest for a given pitch. The need for deburring is eliminated and the inserts are optimized for the best tool life at that pitch.
- Non-cresting partial profile inserts offer the flexibility to cut a variety of thread pitches with one insert.
- Right-hand Laydown Threading toolholders use right-hand inserts. Left-hand Laydown Threading toolholders use left-hand inserts.
- Right-hand Laydown Threading boring bars use right-hand inserts. Left-hand Laydown Threading boring bars use left-hand inserts.

Catalog Numbering System

3	E	R	A	ISO	
Insert Size	Insert Type	Hand of Insert	Thread Pitch	Thread Profile	Number of Teeth

E — External thread

I — Internal thread

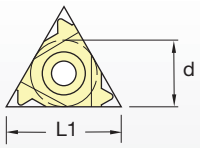
R — Right-hand thread

L — Left-hand thread

Single tooth profile — No symbol

Multi-tooth profile — Number of teeth (cutting edge and symbol)

Multi-tooth profile with two teeth — 2M



symbol	d	L1
2	0.250	11
3	0.375	16
4	0.500	22
5	0.625	27

Partial profile inserts

symbol	mm
A	0,5–1,5
AG	0,5–3,0
G	1,7–3,0
N	3,5–5,0
Q	5,5–6,0

Full profile inserts

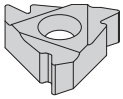
symbol	mm
Actual TPI	0,5–0,4

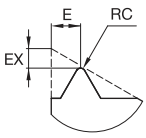
55	Partial Profile 55°
60	Partial Profile 60°
ISO	ISO Metric 60°
TR	Trapez DIN 103°
UN	ISO Inch/American UN 60°
W	Whitworth 55°
NPT	American National Pipe Thread 60°
RD	Round
PG	Steel Conduit
APIRD	API Round

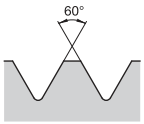
Recommended Cutting Speeds • Metric

Material Group		Cutting Speed — vc m/min		
		TN6025		
		min	Start	max
P	0/1	130	**140**	150
	2	110	**145**	175
	3	110	**145**	175
	4	75	**95**	115
	5	100	**125**	145
	6	40	**55**	65
M	1	60	**75**	90
	2	40	**50**	55
	3	40	**50**	60
K	1	60	**80**	90
	2	60	**75**	85
	3	60	**75**	90
N	1	600	**750**	900
	2	535	**685**	835
	3	230	**300**	370
	4	135	**180**	225
	5	70	**90**	110
	6	445	**565**	690
	7	550	**700**	850
S	1	25	**35**	40
	2	15	**20**	20
	3	40	**60**	70
	4	20	**30**	35

Threading Inserts • ER/L-60







Partial Profile 60°
External

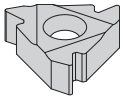
● first choice
○ alternate choice

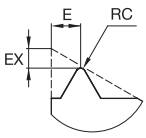
P	●
M	●
K	○
N	○
S	●
H	○

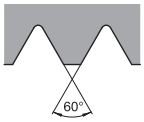
catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
3ERA60	0,05	0,8	0,9	3	0,50-1,50	16-48	–	2018214
2ERA60	0,05	0,9	0,8	2	0,50-1,50	16-48	–	2007404
3ERAG60	0,08	1,2	1,7	3	0,50-3,0	8-48	–	2018246
3ERG60	0,28	1,2	1,7	3	1,75-3,0	8-14	–	2018222
4ERN60	0,53	1,7	2,5	4	3,5-5,0	5-7	–	2018252
left hand								
3ELAG60	0,08	1,2	1,7	3	0,50-3,0	8-48	–	2071904

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-60







Partial Profile 60° Internal

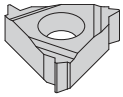
● first choice
○ alternate choice

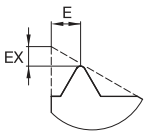
P		●
M		●
K		○
N		○
S		●
H		○

catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
2IRA60	0,05	0,8	0,9	2	0,50-1,50	16-48	–	2018262
3IRA60	0,05	0,8	0,9	3	0,50-1,50	16-48	–	2018272
3IRAG60	0,05	1,2	1,7	3	0,50-3,0	8-48	–	2018284
3IRG60	0,15	1,2	1,7	3	1,75-3,0	8-14	–	2018278
5IRQ60	0,30	1,8	2,7	5	5,5-6,0	4-4.5	–	2018295
4IRN60	0,31	1,7	2,5	4	3,5-5,0	5-7	–	2018290
left hand								
2ILA60	0,05	0,8	0,9	2	0,50-1,50	16-48	–	2021656
3ILAG60	0,05	1,2	1,7	3	0,50-3,0	8-48	–	2008275
4ILN60	0,31	1,7	2,5	4	3,5-5,0	5-7	–	2100489

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-ISO





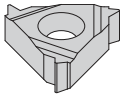
● first choice
○ alternate choice

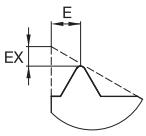
P	●
M	●
K	○
N	○
S	●
H	○

catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3ER05ISO	0,6	0,4	3	0,50	–	–	2018377
3ER07ISO	0,6	0,6	3	0,70	–	–	2018389
3ER075ISO	0,6	0,6	3	0,75	–	–	2018395
3ER08ISO	0,6	0,6	3	0,80	–	–	2018403
3ER10ISO	0,7	0,7	3	1,00	–	–	2018411
3ER125ISO	0,8	0,9	3	1,25	–	–	2018421
3ER15ISO	0,8	1,0	3	1,50	–	–	2018429
3ER175ISO	0,9	1,2	3	1,75	–	–	2018445
3ER20ISO	1,0	1,3	3	2,00	–	–	2018460
3ER25ISO	1,1	1,5	3	2,50	–	–	2018472
3ER30ISO	1,2	1,6	3	3,00	–	–	2008256

Threading Inserts • ER/L-ISO

(continued)





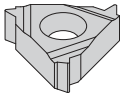
● first choice
○ alternate choice

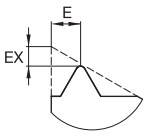
P	●
M	●
K	○
N	○
S	●
H	○

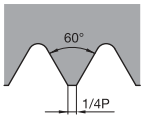
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
4ER35ISO	1,6	2,3	4	3,50	–	–	2018495
4ER40ISO	1,6	2,3	4	4,00	–	–	2018501
4ER45ISO	1,7	2,4	4	4,50	–	–	2018508
4ER50ISO	1,7	2,5	4	5,00	–	–	2018517
5ER55ISO	2,7	1,9	5	5,50	–	–	2018522
5ER60ISO	2,9	2,0	5	6,00	–	–	2018528
left hand							
3EL10ISO	0,7	0,7	3	1,00	–	–	2008187
3EL035ISO	0,8	0,4	3	0,35	–	–	3122015
3EL15ISO	0,8	1,0	3	1,50	–	–	2018435
3EL20ISO	1,3	1,0	3	2,00	–	–	2018466

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-ISO







ISO Metric-Internal

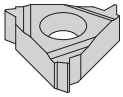
● first choice
○ alternate choice

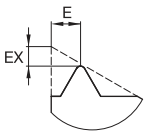
P	●
M	●
K	○
N	○
S	●
H	○

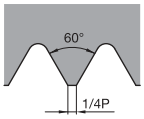
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3IR05ISO	0,6	0,6	3	0,50	–	–	2018582
3IR075ISO	0,6	0,6	3	0,75	–	–	2018596
3IR10ISO	0,6	0,7	3	1,00	–	–	2018612
3IR125ISO	0,8	0,9	3	1,25	–	–	2018626
2IR15ISO	0,8	1,0	2	1,50	–	–	2018550
3IR15ISO	0,8	1,0	3	1,50	–	–	2018636
3IR175ISO	0,9	1,2	3	1,75	–	–	2018652
3IR20ISO	1,0	1,3	3	2,00	–	–	2018663
3IR25ISO	1,1	1,5	3	2,50	–	–	2018674
3IR30ISO	1,1	1,5	3	3,00	–	–	2018684
4IR35ISO	1,6	2,3	4	3,50	–	–	2018695

Threading Inserts • IR/L-ISO

(continued)







ISO Metric-Internal

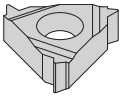
● first choice
○ alternate choice

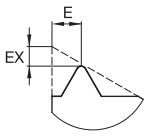
P		●
M		●
K		○
N		○
S		●
H		○

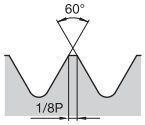
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
4IR40ISO	1,6	2,3	4	4,00	–	–	2018702
4IR50ISO	1,6	2,3	4	5,00	–	–	2018714
5IR55ISO	1,6	2,3	5	5,50	–	–	2021597
4IR45ISO	1,6	2,4	4	4,50	–	–	2018708
5IR60ISO	1,8	2,5	5	6,00	–	–	2018720
left hand							
3IL075ISO	0,6	0,6	3	0,75	–	–	2018598
3IL15ISO	0,8	1,0	3	1,50	–	–	2018642
3IL30ISO	1,1	1,5	3	3,00	–	–	2018688

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-UN







American
UN-External

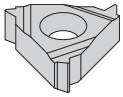
● first choice
○ alternate choice

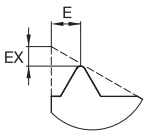
P	●
M	●
K	○
N	○
S	●
H	○

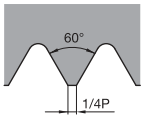
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3ER32UN	0,6	0,6	3	–	32	–	2018752
3ER28UN	0,6	0,7	3	–	28	–	2018756
3ER24UN	0,7	0,8	3	–	24	–	2018766
3ER20UN	0,8	0,9	3	–	20	–	2018772
3ER18UN	0,8	1,0	3	–	18	–	2018778
3ER16UN	0,9	1,1	3	–	16	–	2018782
3ER14UN	1,0	1,2	3	–	14	–	2018790
3ER12UN	1,1	1,4	3	–	12	–	2018802
3ER11UN	1,1	1,5	3	–	11	–	2018808
3ER10UN	1,1	1,5	3	–	10	–	2018814
3ER8UN	1,2	1,6	3	–	8	–	2018824
3ER13UN	1,3	1,0	3	–	13	–	2018796

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-UN







American
UN-Internal

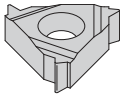
● first choice
○ alternate choice

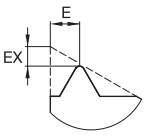
P	●
M	●
K	○
N	○
S	●
H	○

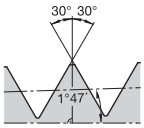
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3IR20UN	0,8	0,9	3	–	20	–	2018938
3IR18UN	0,8	1,0	3	–	18	–	2018944
2IR18UN	0,8	1,0	2	–	18	–	2018882
3IR16UN	0,9	1,1	3	–	16	–	2018950
2IR16UN	0,9	1,1	2	–	16	–	2018886
3IR12UN	1,1	1,4	3	–	12	–	2018966
3IR8UN	1,1	1,5	3	–	8	–	2018990
left hand							
3IL12UN	1,1	1,4	3	–	12	–	2102749

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-NPT







NPT-External

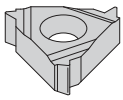
● first choice
○ alternate choice

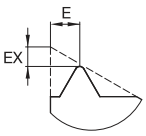
P	●
M	●
K	○
N	○
S	●
H	○

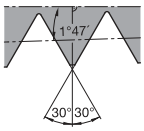
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3ER18NPT	0,8	1,0	3	–	18	.7500	2019278
3ER14NPT	0,9	1,2	3	–	14	.7500	2019288
3ER115NPT	1,1	1,5	3	–	11.5	.7500	2019298
3ER8NPT	1,3	1,8	3	–	8	.7500	2019305

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-NPT







NPT-Internal

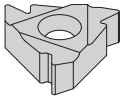
● first choice
○ alternate choice

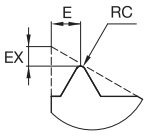
P	●
M	●
K	○
N	○
S	●
H	○

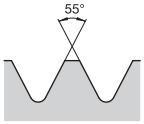
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3IR14NPT	0,9	1,2	3	–	14	.7500	2019329
3IR115NPT	1,1	1,5	3	–	11.5	.7500	2019335

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-55







Partial Profile 55°
External

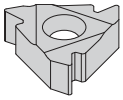
● first choice
○ alternate choice

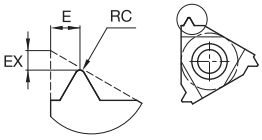
P	●
M	●
K	○
N	○
S	●
H	○

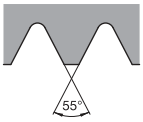
catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
3ERAG55	0,08	1,2	1,7	3	0,50-3,0	8-48	–	2018314
3ERG55	0,20	1,2	1,7	3	1,75-3,0	8-14	–	2018308
4ERN55	0,43	1,7	2,5	4	3,5-5,0	5-7	–	2018320
left hand								
3ELG55	0,20	1,2	1,7	3	1,75-3,0	8-14	–	2008190

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-55







Partial Profile 55°
Internal

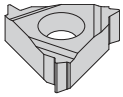
● first choice
○ alternate choice

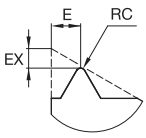
P		●
M		●
K		○
N		○
S		●
H		○

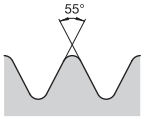
catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
2IRA55	0,05	0,8	0,9	2	0,50-1,50	16-48	–	2018328
3IRA55	0,05	0,8	0,9	3	0,50-1,50	16-48	–	2018334
3IRAG55	0,07	1,2	1,7	3	0,50-3,0	8-48	–	2018346
3IRG55	0,21	1,2	1,7	3	1,75-3,0	8-14	–	2018340
4IRN55	0,43	1,7	2,5	4	3,5-5,0	5-7	–	2018354
left hand								
3ILA55	0,05	0,8	0,9	3	0,50-1,50	16-48	–	3122449

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-W







Whitworth BSW, BSF, BSP-External

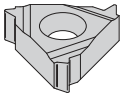
● first choice
○ alternate choice

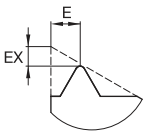
P		●
M		●
K		○
N		○
S		●
H		○

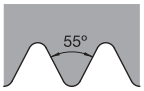
catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
3ER32W	0,08	0,6	0,6	3	–	32	–	2019023
3ER28W	–	0,6	0,7	3	–	28	–	2019029
3ER19W	–	0,8	1,0	3	–	19	–	2019055
3ER14W	–	1,0	1,2	3	–	14	–	2019071
3ER10W	–	1,1	1,5	3	–	10	–	2019089
3ER11W	–	1,1	1,5	3	–	11	–	2019083
3ER8W	–	1,2	1,5	3	–	8	–	2019101

SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-W







Whitworth BSW, BSF, BSP-Internal

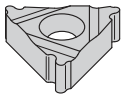
● first choice
○ alternate choice

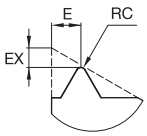
P	●
M	●
K	○
N	○
S	●
H	○

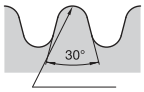
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
2IR14W	0,9	1,1	2	–	14	–	2019136
3IR14W	1,0	1,2	3	–	14	–	2019189
3IR11W	1,1	1,5	3	–	11	–	2019205

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-RD







Round External

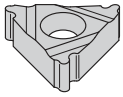
● first choice
○ alternate choice

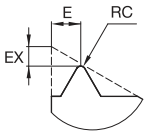
P	●
M	●
K	○
N	○
S	●
H	○

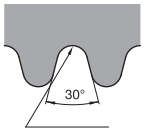
catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
3ER8RD	0,76	1,4	1,3	3	–	8	–	2019347

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-RD







Round-Internal
R = 0,221P

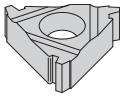
● first choice
○ alternate choice

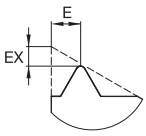
P	●
M	●
K	○
N	○
S	●
H	○

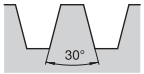
catalogue number	RC	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand								
3IR8RD	0,70	1,4	1,4	3	–	8	–	2019381
4IR4RD	1,40	2,3	2,2	4	–	4	–	2019400

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • ER/L-TR







Trapez-External

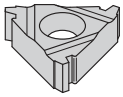
● first choice
○ alternate choice

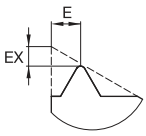
P	●
M	●
K	○
N	○
S	●
H	○

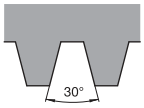
catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3ER2TR	1,1	1,3	3	2,00	–	–	2019453
3ER3TR	1,3	1,5	3	3,00	–	–	2019461
4ER4TR	1,7	1,9	4	4,00	–	–	2019469
4ER5TR	2,1	2,5	4	5,00	–	–	2019479
5ER6TR	2,3	2,7	5	6,00	–	–	2019487
left hand							
3EL3TR	1,3	1,5	3	3,00	–	–	2019463

NOTE: SSC = To correspond with the SSC on the toolholder.

Threading Inserts • IR/L-TR







Trapez-Internal

● first choice
○ alternate choice

P		●
M		●
K		○
N		○
S		●
H		○

catalogue number	EX	E	SSC	thread pitch mm	TPI	TPF	TN6025
right hand							
3IR3TR	1,3	1,5	3	3,00	–	–	2019511
4IR4TR	1,7	1,9	4	4,00	–	–	2019520
4IR5TR	2,1	2,5	4	5,00	–	–	2019528
5IR6TR	2,3	2,7	5	6,00	–	–	2019534

NOTE: SSC = To correspond with the SSC on the toolholder.

Laydown Threading Toolholder • Catalog Numbering System

A	L	25	3	R
Toolholder Construction	Tool Type	Shank Size	Insert Size	Hand of Tool

A —
Shim required

N —
Without shim

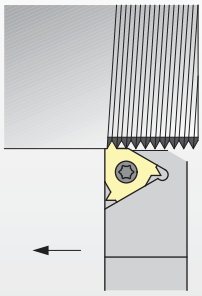
Toolholders

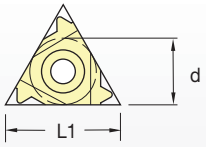
- First two numbers are shank height in mm.

RH —
Thread symbol R

LH —
Thread symbol L

L — External Thread



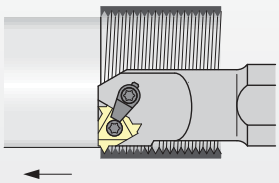


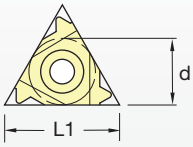
symbol	d	L1
2	6,35	11
3	9,52	16
4	12,7	22
5	15,88	27

Laydown Threading Boring Bar • Catalog Numbering System

A	VR		20	3	R
Shim Requirement	Tool Type	Coolant Capability	Shank Head Diameter	Insert Size	Hand of Tool
A — Shim required **N** — No shim required **O** — Miniature holder		**C** — With coolant	10, 12, 13, 16, 20, 25, 32, 40, 50 6.2 (Mini adjust) 8.0 (Mini adjust)		**RH** — Thread symbol R **LH** — Thread symbol L

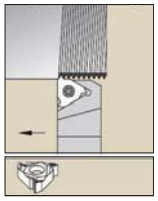
VR — Internal round shank

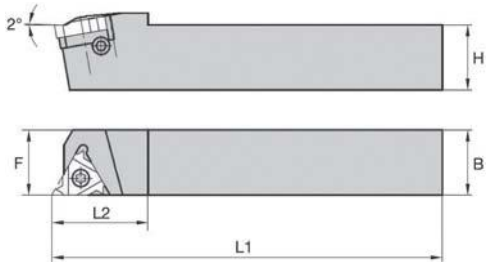




symbol	d	L1
2	6,35	11
3	9,52	16
4	12,7	22
5	15,88	27

Integral Toolholders • N/A • Metric



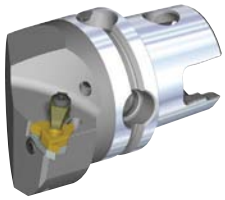


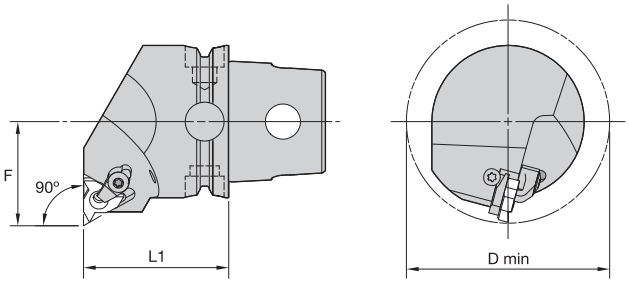
Right Hand Tool

order number	catalogue number	SSC	H	B	F	L1	L2
right hand							
2022340	NL82R	2	8	8	11	136	18
2009587	AL163R	3	16	16	16	100	25
2009591	AL203R	3	20	20	20	128	30
2009594	AL253R	3	25	25	25	153	30
2009600	AL323R	3	32	32	32	173	30
2009597	AL254R	4	25	25	25	155	36
2009603	AL324R	4	32	32	32	175	36
2022589	AL325R	5	32	32	32	176	40
left hand							
2071294	AL163L	3	16	16	16	100	25
2071295	AL203L	3	20	20	20	125	30

NOTE: SSC = To correspond with the SSC on the insert.

Cutting Units • KM40TS • LSE-N 90° • Internal Only • Metric



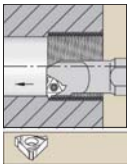


KM™ QUICK CHANGE

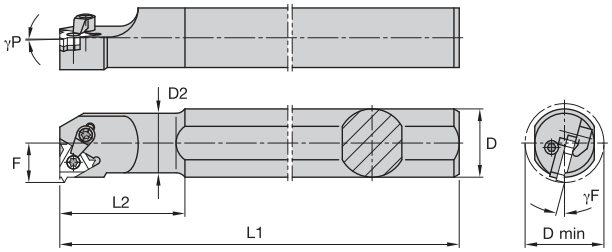
order number	catalogue number	L1 mm	L1 in	F mm	F in	D min mm	D min in	gage insert	kg	lbs
right hand										
3950832	KM40TSLSER16N	40	1.575	27	1.063	54	2.126	LT16NR	0,35	.78
3950854	KM40TSLSER22N	40	1.575	27	1.063	54	2.126	LT22NR	0,35	.77
left hand										
3950831	KM40TSLSEL16N	40	1.575	27	1.063	54	2.126	LT16NL	0,35	.78

NOTE: Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.

Integral I.D. Threading Boring Bars • N/A-VR • Metric



Steel shank without through coolant.

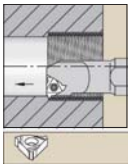


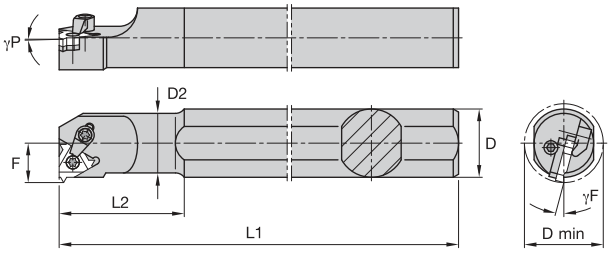
Right Hand Tool

order number	catalogue number	SSC	D	D min	D2	F	L1	L2	γF°	γP°
right hand										
2025828	**NVR102R**	2	20	13	10	7	180	25	-15,0°	-1,5
2022342	**NVR132R**	2	20	16	13	9	180	32	-15,0°	-1,5
2012307	**NVR163R**	3	20	20	16	12	180	40	-15,0°	-1,5
2009609	**AVR203R**	3	20	24	20	13	180	50	-15,0°	-1,5
2009628	**AVR25D3R**	3	25	29	25	16	200	45	-15,0°	-1,5
2009612	**AVR253R**	3	32	29	25	16	250	60	-15,0°	-1,5
2009640	**AVR32D3R**	3	32	36	32	20	250	60	-15,0°	-1,5
2022343	**NVR204R**	4	20	27	20	16	180	50	-15,0°	-1,5
2009631	**AVR25D4R**	4	25	32	25	17	200	45	-15,0°	-1,5
2009625	**AVR254R**	4	32	32	25	17	250	60	-15,0°	-1,5
2009634	**AVR324R**	4	32	39	32	22	250	60	-15,0°	-1,5
2009637	**AVR325R**	5	32	40	32	22	250	60	-15,0°	-1,5
left hand										
2071317	**NVR163L**	3	20	20	16	12	180	40	-15,0°	-1,5
2071318	**AVR203L**	3	20	24	20	13	180	40	-15,0°	-1,5
2065134	**AVR25D3L**	3	25	29	25	16	200	45	-15,0°	-1,5
2114832	**AVR253L**	3	32	29	25	16	250	60	-15,0°	-1,5

NOTE: Items listed without a shim are designed for a 1.5° inclination angle.
SSC = To correspond with the SSC on the insert.

Integral I.D. Threading Boring Bars • OVR • Metric



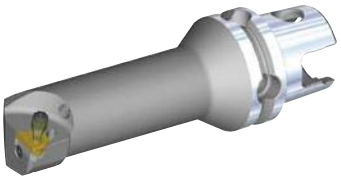


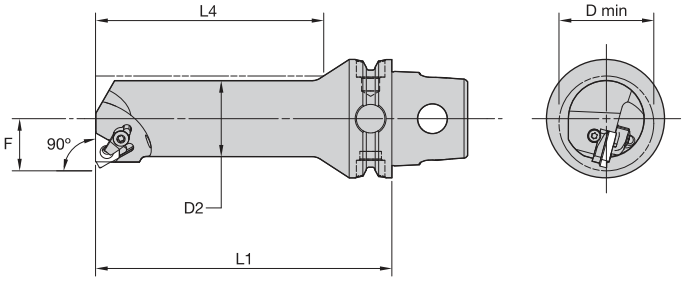
Right Hand Tool

order number	catalogue number	SSC	D	D min	D2	F	L1	L2	γF°	γP°
right hand										
2012325	**OVR122R**	2	12	13	10	7	100	25	-15,0°	-0,5
2022345	**OVR152R**	2	15	16	13	9	100	32	-15,0°	-0,5

NOTE: WIDIA™ miniature holders are for use on automatic machines as used in the optical and precision mechanics industries. The shank dimensions correspond to conventional hardmetal or HSS tools. Holders with round or square shanks are available. An internal RH tool can also be used for external LH threads in the same way an internal LH tool can be used for external RH threads. Please use correct inserts. The inclination angle on this tool is 0.5°. Tools are always clamped with the shank parallel to the part.
SSC = To correspond with the SSC on the insert.

Cutting Units • KM40TS • LSE 90° • Metric





KM QUICK CHANGE

		D2		D min		F		L4		L1				
order number	catalogue number	mm	in	mm	in	mm	in	mm	in	mm	in	gage insert	kg	lbs
right hand														
3955464	**KM40TSS10DLSER11**	10	.394	13	.51	7	.276	35	1.38	60	2.362	LT11NR	0,22	.49
3955466	**KM40TSS12ELSER11**	12	.472	16	.63	9	.354	42	1.66	70	2.756	LT11NR	0,25	.56
3955468	**KM40TSS16FLSER16**	16	.630	20	.79	11	.433	56	2.21	80	3.150	LT16NR	0,28	.61
3955470	**KM40TSS20GLSER16**	20	.787	25	.98	13	.512	70	2.76	90	3.543	LT16NR	0,34	.75
3955472	**KM40TSS25HLSER16**	25	.984	32	1.26	17	.669	75	2.95	100	3.937	LT16NR	0,50	1.11
3955474	**KM40TSS32JLSER16**	32	1.260	40	1.57	22	.866	96	3.78	110	4.331	LT16NR	0,72	1.58
3955476	**KM40TSS32JLSER22**	32	1.260	40	1.57	22	.866	96	3.78	110	4.331	LT22NR	0,71	1.56
left hand														
3955463	**KM40TSS10DLSEL11**	10	.394	13	.51	7	.276	35	1.38	60	2.362	LT11NL	0,22	.49
3955465	**KM40TSS12ELSEL11**	12	.472	16	.63	9	.354	42	1.65	70	2.756	LT11NL	0,25	.55
3955469	**KM40TSS20GLSEL16**	20	.787	25	.98	13	.512	70	2.76	90	3.543	LT16NL	0,34	.75
3955471	**KM40TSS25HLSEL16**	25	.984	32	1.26	17	.669	75	2.95	100	3.937	LT16NL	0,50	1.11
3955473	**KM40TSS32JLSEL16**	32	1.260	40	1.57	22	.866	96	3.78	110	4.331	LT16NL	0,72	1.58
3955475	**KM40TSS32JLSEL22**	32	1.260	40	1.57	22	.866	96	3.78	110	4.331	LT22NL	0,71	1.56

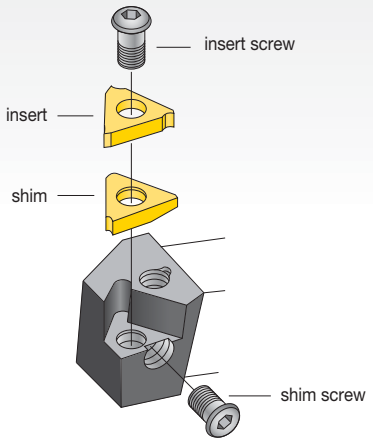
NOTE: Items listed without a shim are designed for a 1,5° inclination angle.
Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.

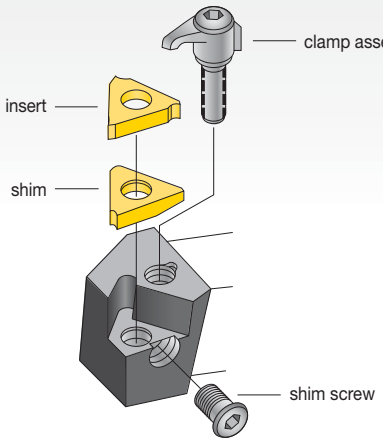
Hardware

Laydown Threading Toolholders

In all cases, the proper shim selection is important.

WIDIA™ toolholders are supplied with a shim for a 1.5° lead angle. Change the shim if your thread is more than 1° different.
For more details on proper shim selections, see pages E514–E515.





insert size and screw		insert screw	shim	shim screw and washer	clamp assembly
3ER		S-SA3T	SM-YIE3	S-SY3T	CK-C3
3EL		S-SA3T	SM-YI3	S-SY3T	CK-C3
4ER		S-SA4T	SM-YIE4	S-SY4T	CK-C4
4EL		S-SA4T	SM-YI4	S-SY4T	CK-C4
Laydown Threading boring bars					
2IR		S-SN2T	–	–	–
2IL		S-SN2T	–	–	–
3IR		S-SA3T	SM-YI3	S-SY3T	CK-C3
3IL		S-SA3T	SM-YIE3	S-SY3T	CK-C3
4IR		S-SA4T	SM-YI4	S-SY4T	CK-C4
4IL		S-SA4T	SM-YIE4	S-SY4T	CK-C4

SM	—	Y	E	3	—	2N
Shim		Y-shim for Laydown standard inserts	**E** — External **I** — Internal	**iC** — 16mm		Shim Angle

2P	2° positive
1P	1° positive
–	0°
1N	1° negative
2N	2° negative
3N	3° negative

Screw Thread Definitions

resultant angle		3.5º	2.5º	1.5º	0.5º	-0.5º	-1.5º
insert size (iC)	toolholder	shim ordering code					
16mm	ex. RH/in. LH ex. LH/in. RH	SM-YE3-2P SM-YI3-2P	SM-YE3-1P SM-YI3-1P	SM-YE3 SM-YI3	SM-YE3-1N SM-YI3-1N	SM-YE3-2N SM-YI3-2N	SM-YE3-3N SM-YI3-3N
22mm	ex. RH/in. LH ex. LH/in. RH	SM-YE4-2P SM-YI4-2P	SM-YE4-1P SM-YI4-1P	SM-YE4 SM-YI4	SM-YE4-1N SM-YI4-1N	SM-YE4-2N SM-YI4-2N	SM-YE4-3N SM-YI4-3N

Slanted Shim Kit

Because you might occasionally need different shims than those supplied with our standard toolholders, we strongly recommend that shim kits be readily available in every tool shop.

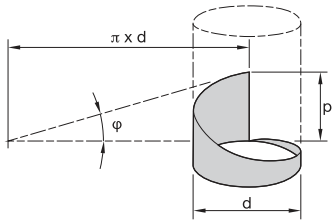
insert size	shim size (D)	ordering code	contains slanted shims
3x	16mm	ABY3	SM-YE3-2P, 1P, 1N, 2N, 3N SM-YI3-2P, 1P, 1N, 2N, 3N
4x	22mm	ABY4	SM-YE4-2P, 1P, 1N, 2N, 3N SM-YI4-2P, 1P, 1N, 2N, 3N

The Helix Angle

Example:
d = 48,06mm (1.892”)
p = 3,175mm (.125”)

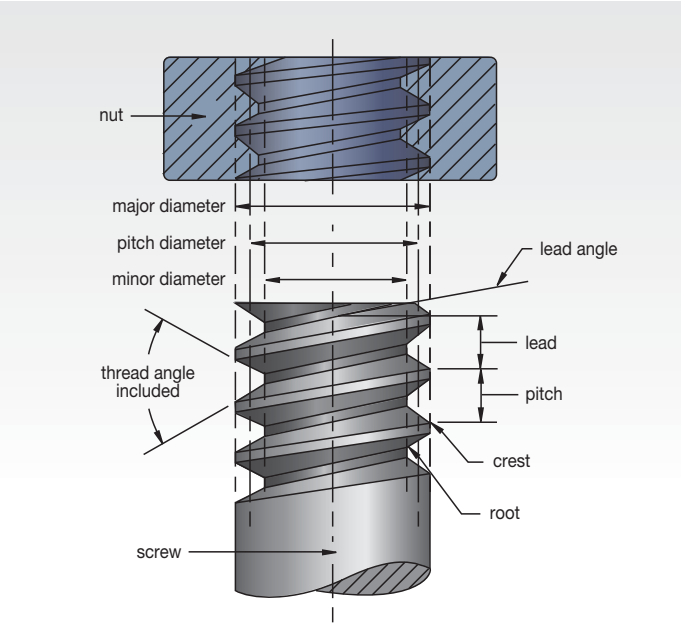
ϕ = Helix angle
p = pitch
d = pitch diameter

$$\phi = \arctan\left(\frac{p * \text{starts}}{\pi * \varnothing}\right) = 1.13°$$



Screw Thread Definitions

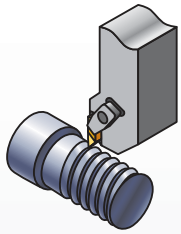
1. Major diameter — The largest diameter of a straight screw thread. This applies to both internal and external threads.
2. Pitch diameter — On a straight thread, it is the diameter which passes through the thread profiles at such points which make the thread width of the groove equal to one-half of the basic pitch. On a “perfect thread,” this occurs at the point where the widths of the thread and groove are equal.
3. Thread angle (included) — The included angle between the individual flanks of the thread form.
4. Minor diameter — The smallest diameter of a straight screw thread. This applies to both internal and external threads.
5. Lead angle — On a straight thread, the lead angle is the angle created by the helix of the thread at the pitch diameter with a plane perpendicular to the axis.
6. Lead — The distance a screw thread advances axially in one revolution. On a single start, the pitch and lead are identical. The lead is equal to the pitch times the number of starts.
7. Pitch — The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the thread axis.
8. Crest — The outermost most surface of the thread form which joins the flanks.
9. Root — The innermost most surface of the thread form which joins the flanks.



NOTE: Threads per inch (TPI) not shown:
The number of threads per inch measured axially.
The terms pitch and TPI are often used interchangeably. TPI = 1/pitch

TopThread™ Threading

TopThread External Threading

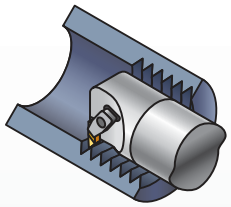


Square Shank Toolholder Sizes:
- Metric — 10–32mm

Cresting (Full Profile):
UN TPI of 32–7
ISO 1,5–3,0mm pitch

60° Partial Profile — Flat Top (NTF and NTK):
UN 44–4.5 TPI
ISO 0,6–5,5mm pitch

TopThread Internal Threading



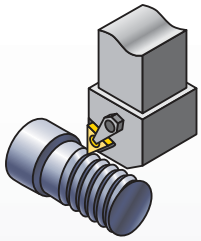
Boring Bar Diameters:
- Metric — 10–50mm
- Minimum bore — 11,5mm
- Steel

Cresting (Full Profile):
UN 16–8 TPI
ISO 1,5–3,0mm pitch

60° Partial Profile — Flat Top (NT-1L, NTF, and NTK):
UN 24–4.5 TPI
ISO 1,0–5,5mm pitch

Laydown Threading

Laydown External Threading

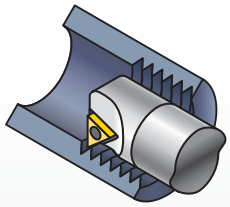


Square Shank Toolholder Sizes:
- Metric — 8–40mm

Cresting (Full Profile):
UN 48–8 TPI
ISO 0,5–5,0mm pitch

60° Partial Profile:
UN 48–4 TPI
ISO 0,5–6,0mm pitch

Laydown Internal Threading



Boring Bar Diameters:
- Metric — 12–50mm
- Minimum bore — (13mm)
- Steel and carbide

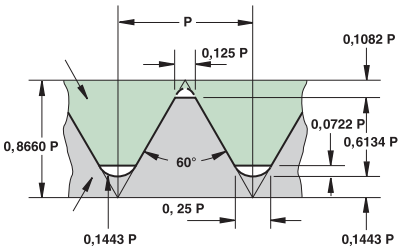
Cresting (Full Profile) and Partial Profile:
UN 48–8 TPI
ISO 0,5–5,0mm pitch

60° Partial Profile:
UN 48–4 TPI
ISO 0,5–6,0mm pitch

55° Partial Profile:
UN 48–5 TPI
ISO 0,5–5,0mm pitch

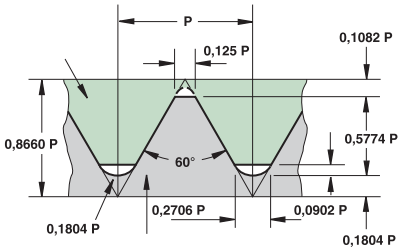
Common Thread Forms

ISO M (Metric) and UN (Unified National)



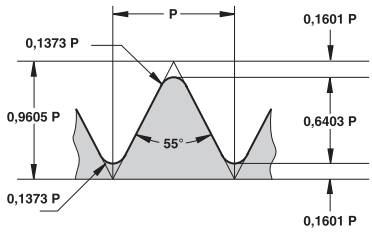
Use: All branches of mechanical industry.

UNJ (controlled root radius)



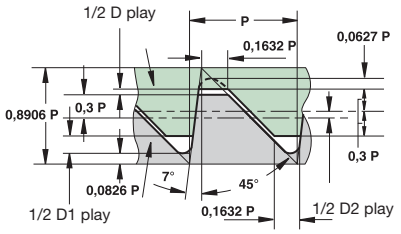
Use: Aircraft and space industry.

Whitworth (BSW)



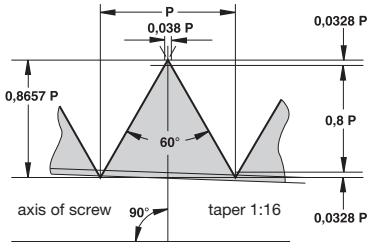
Use: Fittings and pipe couplings for gas, water, and sewer lines (replaced by ISO).

American Buttress



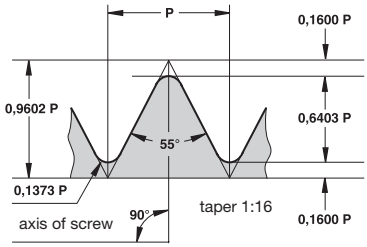
Use: Fittings and pipe couplings.

NPT (American National Pipe Thread)



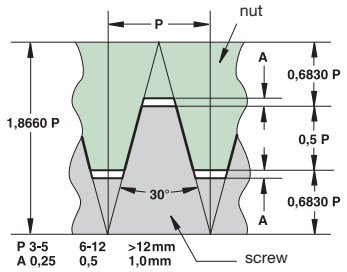
Use: Fittings and pipe couplings.

BSPT (British Standard Pipe Thread)



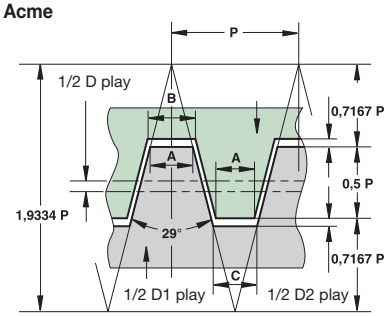
Use: Pipe thread for steam, gas, and water lines.

TR DIN 103



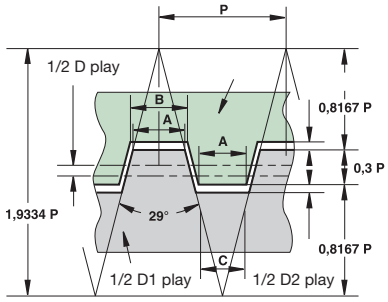
Use: Mechanical industry for motion transmission screws.

Acme



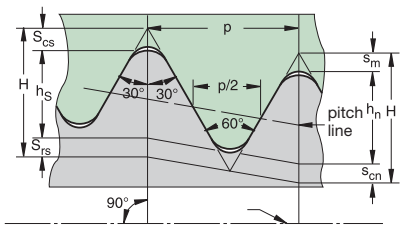
A = 0,0307 P
B = 0,3707 P—x D play
C = 0,3707 P—(D1 play—D2 play)
Use: Acme-General is used in mechanical industry for motion transmission screws.

Acme, truncated (Stub)



A = 0,4224 P
B = 0,4224 P—x D play
C = 0,4224 P—(D1 play—D2 play)
Use: Where normal Acme is too deep.

API Casing and Tubing Round Thread Form



taper = 62,5mm per meter on diameter

NOTE: Taper shown exaggerated.

Grade Selection Chart

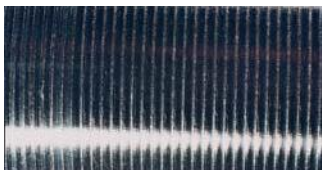
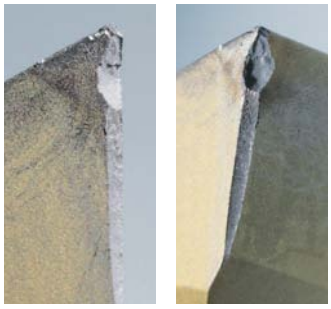
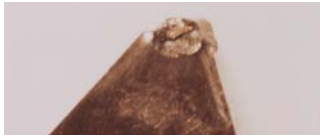
Suggested Grades and Speeds for Threading Various Workpiece Materials

workpiece group	workpiece material	recommended surface speed — SFM		
		uncoated	PVD coated	
		THM	TN6010	TN6025
free-machining carbon steel	10L18, 10L45, 1213, 12L13, 12L14, 1140, 1141, 11L44, 1151, 10L50	—	91–98	45–198
plain carbon steel	10063, 1008, 1010, 1015, 1018, 1020, 1025, 1026, 1108, 1117	—	76–198	45–175
alloy steels/tool steels 150–325 HB (up to 35 HRC)	1042, 1045, 1070, 1080, 1085, 1090, 1095, 1541, 1561, 1572, 5140, 8620, W1, O1, S1, P20, H13, D2, A6, H13, L6	—	76–198	38–167
alloy steels/tool steels 330–450 HB (36–47 HRC)		—	61–160	—
martensitic/ferritic stainless/precipitation hardening	416, 420F, 440F, 405, 409, 429, 430, 434, 436, 442, PH	—	45–160	30–120
austenitic stainless steel	201, 202, 301, 302, 303, 304, 304, 305, 321, 347, 348, 310, 314, 316, 316L, 330	61–106	61–198	46–137
gray cast iron 135–270 HB	class 20, 30, 35, 45	61–91	61–237	46–122
gray cast iron 275–450 HB	class 50, 55, 60	45–76	45–175	15–76
alloy/ductile iron	A536, J434C, 60-40-18, 80-55-06, 100-70-03	45–76	45–650	100–525
free-machining aluminum alloys	2024-T4, 2014-T6, 6061-T6 2011-T3, 3003-H18, A2, Alcan, Alcoa® 510, Duralumin	122—244	122—265	—
high-silicon aluminum alloys	A380, A390, A380-1, A390-1, A380-2	—	—	—
copper/zinc/brass		76–183	76–304	46–236
non-metallics	Graphite, Nylon, Plastics, Rubbers, Phenolics, Carbon	122–457	122–396	46–305
high-temperature alloys 125–269 HB (up to 27 HRC)	Nickel 200, MONEL®, R405, MONEL K500, INCONEL® 600, INCONEL 625/901x750/718, Waspaloy®, Hastelloy® C	24–37	24–122	13–76
high-temperature alloys 260–450 HB (26–47 HRC)	Rene 95, Waspaloy A286, INCOLOY® 800, Haynes® 188, Stellite™ F, Haynes 25	24–30	30–76	6—61
titanium alloys	Ti-6Al-4V, Tl-5Al-2.5Sn	34–55	34–99	—

NOTE: When workpiece hardness levels are at the top of a range, starting SFM should be at the lower end. Regularly inspect insert clamps for worn flats.

Edge preparation:
Uncoated — sharp
PVD coated — light hone except positive top rake, top rake-sharp

Failure and Solution Guide

problem	cause	possible solution
thread with torn finish 	• Burs. • Torn finish. • Steps. • Improper shim. • Improper infeed.	• Use modified flank infeed. • Use full profile insert. • Increase coolant concentration. • Increases cutting speed. • Check machine “Z” travel axis. • Check insert form. • Check for correct shim in LT system. • Calculate flank clearance.
chatter	• Poor rigidity. • Insert movement. • Improper infeed. • Off centerline.	• Use modified flank infeed. • Minimize tool overhang. • Check for workpiece deflection. • Check insert and clamp. • Verify that tool cutting position is at workpiece centerline. • Adjust number of passes. Fewer passes reduce chatter.
built-up edge	• Speed too low. • Insufficient coolant. • Chip load.	• Increase cutting speed. • Increase coolant concentration and/or flow. • Adjust infeed angle. • Increase depth of cut per pass.
deformation	• Wrong grade. • Speed too high. • Improper infeed angle. • Insufficient coolant.	• Use modified flank infeed. • Use a more wear-resistant grade (e.g., TN6010™). • Reduce cutting speed. • Increase coolant flow.
chipping 	• Improper infeed. • Chip load. • Wrong grade. • Incorrect speed. • Poor rigidity.	• Use modified flank infeed. • Increase or decrease number of passes. • Eliminate spring passes. • Use tougher grade (e.g., TN6025™). • Increase cutting speed if chipping on trailing edge. • Decrease cutting speed if chipping on leading edge. • Minimize tool overhang. • Check for insert movement/check clamp. Torque screw or clamp to correct value. • Check for possible part deflection. • Calculate flank clearance. • Ensure correct shim.
broken nose 	• Heavy chip load. • Small nose radius. • Wrong grade. • Improper infeed.	• Use modified flank infeed. • Decrease chip load. • Use large nose radius if possible. • Use tougher grade (e.g., TN6025).
flank wear	• Improper shim. • Wrong grade. • Insufficient coolant. • Off centerline. • Insufficient flank clearance . • Improper infeed angle.	• Ensure correct shim. • Use a more wear-resistant grade (e.g., TN6025). • Increase coolant flow. • Check the centerline height of the tool. (The smaller the diameter, the more critical the need for centerline accuracy.) • Calculate flank clearance and change shim to increase clearance on worn flank. • If wear is on trailing flank, increase infeed angle clearance.

Failure and Solution Guide

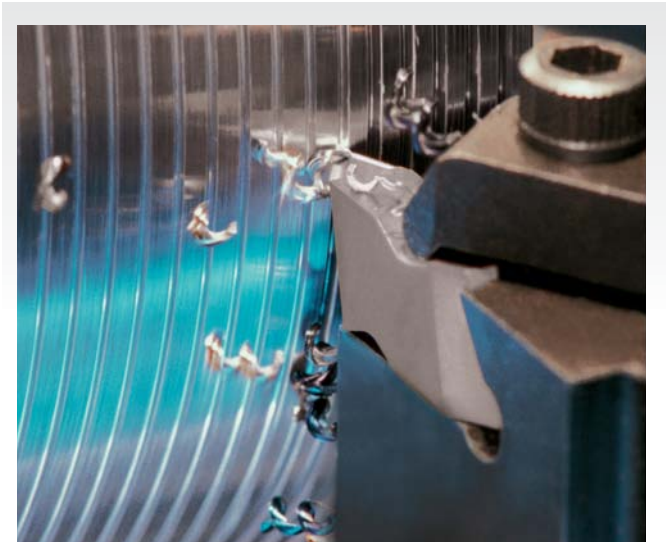
problem	possible solution																	
	increase SFM	reduce SFM	increase chip load	decrease chip load where failure occurs	use tougher carbide grade	use harder carbide grade	apply coolant	use coated carbide	use topping insert	change infeed angle	check for insert movement and reseat	reduce tool overhang	reselect shim	apply chipbreaker style	reduce DOC	adjust center height	begin cutting threads .472" before workpiece	change infeed method
chatter	●			●							●	●				●		●
bur on crest	●								●									●
short tool life		●	●	●		●		●										●
chipped leading edge			●	●	●													
chipped trailing edge					●					●								
broken nose (first pass)	●														●	●		
broken nose (after first pass)				●	●					●			●					●
built-up on cutting edge	●		●				●	●										●
premature topping													●					
splitting threads																	●	
poor chip evacuation														●				●

General Machining Guidelines

WIDIA™ insert technology brings chip control to your threading operations with the TopThread™ platform. The proprietary WIDIA recessed chip groove, when used according to our recommendations, controls the chip in most applications. Our positive rake design lowers cutting pressures, which in turn lowers damaging heat generation thus providing better tool life. Long, stringy chips no longer mar the workpiece surface finish. The danger to operators when removing long chips from the workpiece and chuck is eliminated. All of these benefits combine to improve the productivity of your threading operations.

The Last Pass

Some CNC controls require the last pass to be at a 0° infeed angle because the chip will not break on the last pass. On most carbon and alloy steels, the last pass can remain at 0,127mm depth of cut and produce an acceptable finish. For some materials, a 0,025mm to 0,076mm (spring) pass may be used to improve surface finish, however, chip breaking action may be compromised.

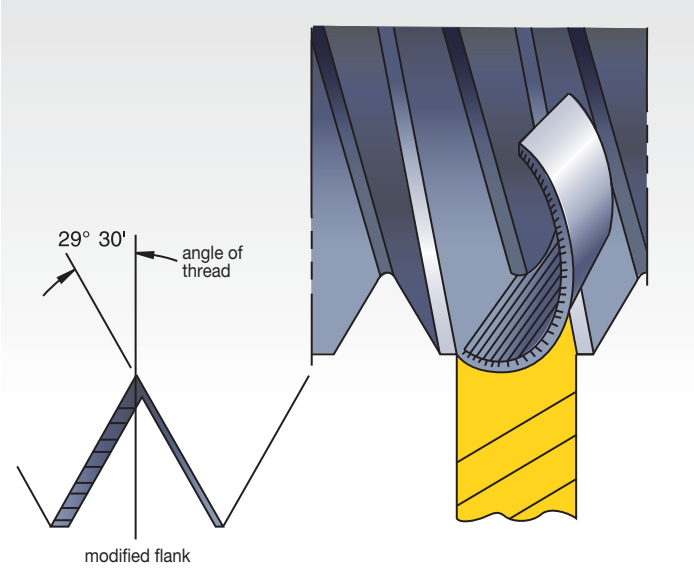


Machine Programming

Modern CNC controls allow the programmer to easily adjust infeed angle, the number of passes, and depth of cut for each pass. The chip control threading insert performs best at an infeed angle of 29° 30', although 15° to 30° is acceptable. Also, it is important to maintain a minimum of 0,127mm depth of cut on every pass. In most applications, use of CNC canned cycles produce only marginally successful results. Custom written programs are better and are recommended.

Infeed Angle

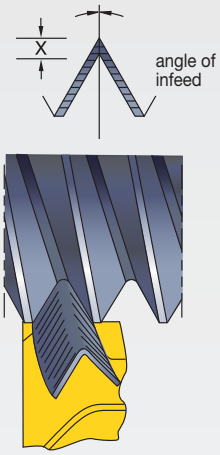
In order to effectively and consistently break the chip, it is important to use an infeed angle between 28° and 29° 30'. Do not apply chip control inserts at infeed angles less than 15°.



General Machining Guidelines

Radial

modified flank



Advantage —

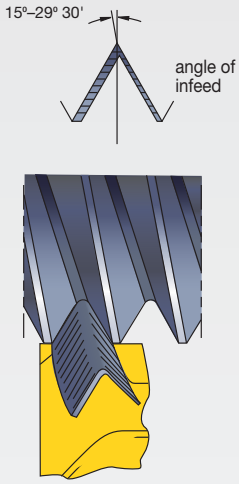
- Cutting on both sides of the thread form places all of the cutting edge in the cut and protects edge from chipping.
- Even wear on the insert.

Disadvantage —

- Tool develops a channel chip that may be difficult to handle.
- Tip chipping occurs when cutting high-tensile materials.
- Bur condition is increased.
- Entire cutting edge is engaged at finish of thread, causing increased tendency to chatter.

Modified flank

modified flank



Advantage —

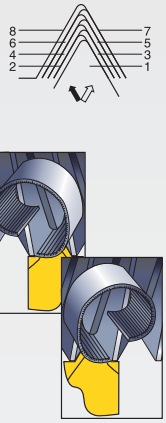
- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.

Disadvantage —

- Similar disadvantages as with 0° infeed, although reduced somewhat in magnitude as cutting forces are better equalized and chip flow is much less of a problem.

Alternating flank

alternating flank



Advantage —

- *Increased tool life because both edges are used equally.*

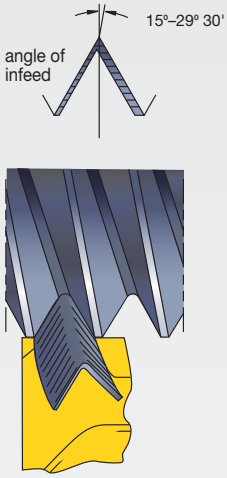
NOTE: Some machine tools may require special programming techniques to achieve this method of infeed.

Disadvantage —

- Difficult to cut on conventional machinery.

Reversed modified flank

modified flank



Advantage —

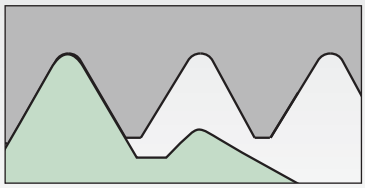
- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.
- As chip flow is the reversed feed direction, it is an excellent choice for internal threading.

Disadvantage —

- Programming needs to be done line by line.

Threading

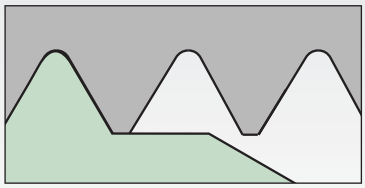
Partial Profile



Tooth profile with universal profile shape:

- 55° or 60° without cutting edges for the tooth tapers.
- Reduced inventory.
- For various pitches in a limited range.
- Preferably one-time production.
- Major/minor diameters must be accurately pre-turned.

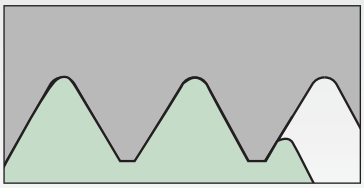
Full Profile



Tooth profile with full profile shape including tooth height:

- For bur-free, precise threads in the specified pitch.
- General application.
- Machining allowance for outside/core diameter around 0,1–0,15mm.

Multi-Tooth Profile



Multi-tooth full profile generally with 2–3 teeth:

- Highly productive threading with fewer passes and longer tool life.
- Requires a rigid setup and long thread pass through.
- Minimum clearance width approximately 1.25 x E as per indexable insert dimensions table.

Formulas

Metric Formula

to find	given	formula
m/min	D (mm) RPM	$m/min = \frac{\pi \times D}{1000} \times RPM$
RPM	D (mm) m/min	$RPM = \frac{m/min \times 1000}{D \times \pi}$

Legend

m/min = meters per minute
RPM = revolutions per minute
D = part diameter
π = 3.1416

Maximum Cutting Speeds

Maximum cutting speed is often limited by the maximum travel speed (IPM or mm/min) of the tool allowed by the machine.

Check your maximum speed with the following formula:

maximum cutting speed (m/min) =
part diameter (mm) x 3.14 x (1/pitch) x $\frac{\text{max mm/min}}{1000\text{mm}}$

Flank Clearance

γ = arctan (sin (β/2) * tan(α))
g = side (flank) clearance
β = included angle of thread form
α = radial inclination angle

Thread	Angle	External	Internal
UN & ISO	60	5.3	8
BSW	55	4.8	7.3
TR	30	2.6	4
ACME	29	2.6	3.9
AMBUT	7	.6	.9
AMBUT	45	4	6

Threading

Recommendation for Threading Infeed Passes

TPI	48–32	28–24	20–16	14–12	11.5–9	8–6	5–4	3–2
metric pitch (mm)	0,50–0,75	0,80–1	1,25–1,5	1,75–2	2,5–3	3,5–4	4,5–6	8
Thread Type	**recommended number of passes**							
Common V-thread forms ISO, UN, UNJ, NPT, Whitworth, BSPT, API Rotary Shoulder	4–5	5–6	6–8	8–10	9–12	12–15	14–16	15–25
Acme, Trapez, Round, API Round	–	–	5–6	7–8	10–11	12–13	13–15	18–20
Stub Acme, API Buttress	–	–	5	5–6	7–8	8–10	10–12	14–16
American Buttress	–	–	7–8	9–10	11–12	13–15	17–19	22–24

Maintain minimum 0,05mm infeed on last passes to avoid work hardening and excessive abrasion of the threading tool.

Constant Volume Infeed Values for Threading Operations

In most applications, use of CNC canned cycles produces only marginally successful results. For example, an 8-pitch external thread has a depth of 2mm (.0789").

$$\Delta ap_x = \frac{ap}{\sqrt{nap-1}} * \sqrt{\phi}$$

Formula for constant chip load infeed

Δap	=	radial infeed
x	=	actual pass (from 1 to the nap)
nap	=	number of passes
ϕ	=	1st pass, 0.3
		2nd pass, 1
		3rd pass and up, x-1

Using Radial Infeed

Bending stress on the cutting edge caused by V-shaped chips from long-chipping steel workpiece materials.

High cutting forces with small cutting thicknesses require sharp edges with high strength.

Using Flank Infeed

Lower bending stress and stabilized cutting edges produce more favorable chip shapes and larger cutting thicknesses.

Carbides with high hardness, good wear resistance, and temperature stability are advantageous.

Guidelines for Infeeds — How to Determine the Number and the Size of Passes

The number of passes "s" per thread is decisive for successful threading and crest turning. The following tables give standard values for the application condition when machining steel. The proper number of passes must be determined empirically.

If insert breakage occurs, the number of passes must be increased. With increased wear, we recommend decreasing the number of passes. The chip thickness should not be less than 0,05mm. The allowance at the diameter should not exceed 0,2mm.

Threading Infeed Tables

Metric ISO, External Thread Cutting

thread pitch P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	4	4	5	6	6	8	8	10	12	14	15	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,096	0,145	0,167	0,187	0,224	0,221	0,252	0,278	0,302	0,328	0,361	0,405	0,435
2	0,080	0,119	0,138	0,154	0,185	0,182	0,208	0,230	0,249	0,271	0,298	0,335	0,359
3	0,073	0,109	0,126	0,141	0,169	0,167	0,191	0,210	0,228	0,248	0,273	0,306	0,329
4	0,056	0,084	0,097	0,108	0,130	0,128	0,146	0,161	0,175	0,190	0,209	0,235	0,252
5			0,082	0,091	0,110	0,108	0,123	0,136	0,148	0,160	0,176	0,198	0,213
6				0,080	0,097	0,095	0,109	0,120	0,130	0,141	0,155	0,175	0,187
7						0,086	0,098	0,108	0,118	0,128	0,141	0,158	0,169
8						0,079	0,090	0,100	0,108	0,118	0,129	0,145	0,156
9								0,093	0,101	0,109	0,120	0,135	0,145
10								0,087	0,095	0,103	0,113	0,127	0,136
11									0,089	0,097	0,107	0,120	0,129
12									0,085	0,092	0,102	0,114	0,122
13										0,088	0,097	0,109	0,117
14										0,085	0,093	0,105	0,112
15											0,090	0,101	0,108
16													0,104
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Metric ISO, Internal Thread Cutting

thread pitch P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718
N Ap	4	4	5	6	6	8	8	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,088	0,129	0,146	0,168	0,199	0,195	0,226	0,246	0,282	0,315	0,328	0,357	0,384
2	0,073	0,106	0,121	0,139	0,164	0,161	0,187	0,203	0,232	0,260	0,271	0,295	0,317
3	0,067	0,097	0,110	0,127	0,151	0,147	0,171	0,186	0,213	0,238	0,248	0,270	0,291
4	0,051	0,075	0,085	0,097	0,116	0,113	0,131	0,143	0,163	0,183	0,190	0,207	0,223
5			0,071	0,082	0,097	0,095	0,111	0,120	0,138	0,154	0,160	0,175	0,188
6				0,072	0,086	0,084	0,097	0,106	0,121	0,136	0,141	0,154	0,166
7						0,076	0,088	0,096	0,110	0,123	0,128	0,139	0,150
8						0,070	0,081	0,088	0,101	0,113	0,118	0,128	0,138
9								0,082	0,094	0,105	0,109	0,119	0,128
10								0,077	0,088	0,099	0,103	0,112	0,120
11									0,083	0,093	0,097	0,106	0,114
12									0,000	0,089	0,092	0,101	0,108
13										0,000	0,088	0,096	0,103
14										0,000	0,085	0,092	0,099
15											0,000	0,089	0,096
16													0,092
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Threading Infeed Tables

UN Thread, External Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	5	6	6	7	9	9	10	11	12	13	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,181	0,193	0,212	0,216	0,177	0,207	0,223	0,264	0,302	0,341	0,374	0,405	0,435
2	0,149	0,159	0,175	0,178	0,146	0,171	0,184	0,218	0,249	0,282	0,309	0,335	0,359
3	0,137	0,146	0,160	0,163	0,134	0,156	0,168	0,200	0,228	0,258	0,283	0,306	0,329
4	0,105	0,112	0,123	0,125	0,103	0,120	0,129	0,153	0,175	0,198	0,217	0,235	0,252
5	0,088	0,094	0,103	0,106	0,087	0,101	0,109	0,129	0,148	0,167	0,183	0,198	0,213
6		0,083	0,091	0,093	0,076	0,089	0,096	0,114	0,130	0,147	0,161	0,175	0,187
7				0,084	0,069	0,080	0,087	0,103	0,118	0,133	0,146	0,158	0,169
8					0,063	0,074	0,080	0,095	0,108	0,122	0,134	0,145	0,156
9					0,059	0,069	0,074	0,088	0,101	0,114	0,125	0,135	0,145
10							0,070	0,083	0,095	0,107	0,117	0,127	0,136
11								0,078	0,089	0,101	0,111	0,120	0,129
12									0,085	0,096	0,105	0,114	0,122
13										0,092	0,101	0,109	0,117
14											0,097	0,105	0,112
15												0,101	0,108
16													0,104
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

UN Thread, Internal Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	1,956	2,286	2,743
N Ap	5	6	6	7	8	9	9	10	11	12	13	14	15
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,160	0,168	0,187	0,193	0,205	0,221	0,241	0,250	0,264	0,285	0,309	0,347	0,402
2	0,132	0,139	0,154	0,159	0,169	0,183	0,199	0,207	0,218	0,236	0,255	0,287	0,332
3	0,121	0,127	0,141	0,146	0,155	0,167	0,182	0,189	0,200	0,216	0,234	0,263	0,304
4	0,093	0,097	0,108	0,112	0,119	0,128	0,140	0,145	0,153	0,166	0,179	0,202	0,233
5	0,078	0,082	0,091	0,094	0,100	0,108	0,118	0,123	0,129	0,140	0,151	0,170	0,196
6		0,072	0,080	0,083	0,088	0,095	0,104	0,108	0,114	0,123	0,133	0,150	0,173
7				0,075	0,080	0,086	0,094	0,098	0,103	0,111	0,120	0,135	0,156
8					0,073	0,079	0,086	0,090	0,095	0,102	0,111	0,124	0,144
9						0,074	0,080	0,084	0,088	0,095	0,103	0,116	0,134
10								0,078	0,083	0,089	0,097	0,109	0,126
11									0,078	0,085	0,092	0,103	0,119
12										0,080	0,087	0,098	0,113
13											0,083	0,094	0,108
14											0,080	0,090	0,104
15													0,100
16													
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	2,036	2,286	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Threading Infeed Tables

NPT Thread, External, and Internal Machining

TPI	27	18	14	11,5	8
T Ap (mm)	0,762	1,118	1,422	1,727	2,489
N Ap	6	8	10	12	14
	values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,187	0,231	0,260	0,285	0,378
2	0,154	0,191	0,214	0,236	0,312
3	0,141	0,175	0,196	0,216	0,286
4	0,108	0,134	0,151	0,166	0,219
5	0,091	0,113	0,127	0,140	0,185
6	0,080	0,100	0,112	0,123	0,163
7		0,090	0,101	0,111	0,147
8		0,083	0,093	0,102	0,135
9			0,087	0,095	0,126
10			0,081	0,089	0,118
11				0,085	0,112
12				0,080	0,107
13					0,102
14					0,098
15					
16					
T Ap (mm)	0,762	1,118	1,422	1,727	2,489

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

BSPT Thread, External, and Internal Machining

TPI	28	19	14	11
T Ap (mm)	0,584	0,864	1,168	1,448
N Ap	5	8	10	12
	values for flank infeed (X/Z)			
order of passes	X/Z	X/Z	X/Z	X/Z
1	0,160	0,179	0,213	0,239
2	0,132	0,148	0,176	0,197
3	0,121	0,135	0,161	0,181
4	0,093	0,104	0,124	0,139
5	0,078	0,087	0,104	0,117
6		0,077	0,092	0,103
7		0,070	0,083	0,093
8		0,064	0,076	0,086
9			0,071	0,080
10			0,067	0,075
11				0,071
12				0,067
13				
14				
15				
16				
T Ap (mm)	0,584	0,864	1,168	1,448

Trapezoid Thread to DIN 103, External, and Internal Machining

pitch	1,5	2	3	4	5
T Ap (mm)	1,016	1,245	1,753	2,261	2,743
N Ap	6	8	10	12	14
	values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,249	0,258	0,320	0,373	0,417
2	0,206	0,213	0,264	0,308	0,344
3	0,188	0,195	0,242	0,282	0,315
4	0,144	0,150	0,186	0,217	0,242
5	0,122	0,126	0,157	0,183	0,204
6	0,107	0,111	0,138	0,161	0,180
7		0,100	0,125	0,145	0,162
8		0,092	0,115	0,134	0,149
9			0,107	0,125	0,139
10			0,100	0,117	0,131
11				0,111	0,123
12				0,105	0,117
13					0,112
14					0,108
15					
16					
T Ap (mm)	1,016	1,245	1,753	2,261	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Round Thread to DIN 405, External, and Internal Machining

pitch	10	8	6
T Ap (mm)	1,321	1,626	2,159
N Ap	8	10	12
	values for flank infeed (X/Z)		
order of passes	X/Z	X/Z	X/Z
1	0,273	0,297	0,357
2	0,226	0,245	0,294
3	0,207	0,224	0,270
4	0,159	0,172	0,207
5	0,134	0,145	0,174
6	0,118	0,128	0,154
7	0,107	0,116	0,139
8	0,098	0,106	0,128
9		0,099	0,119
10		0,093	0,112
11			0,106
12			0,100
13			
14			
15			
16			
T Ap (mm)	1,321	1,626	2,159

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Threading Infeed Tables

Whitworth, External, and Internal Thread Cutting

TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251
N Ap	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,160	0,199	0,199	0,179	0,210	0,261	0,285	0,297	0,312	0,336	0,351	0,398	0,460
2	0,132	0,164	0,164	0,148	0,174	0,215	0,236	0,245	0,258	0,277	0,290	0,329	0,380
3	0,121	0,151	0,151	0,135	0,159	0,197	0,216	0,224	0,236	0,254	0,266	0,301	0,348
4	0,093	0,116	0,116	0,104	0,122	0,151	0,166	0,172	0,181	0,195	0,204	0,231	0,267
5	0,078	0,097	0,097	0,087	0,103	0,128	0,140	0,145	0,153	0,164	0,172	0,195	0,225
6		0,086	0,086	0,077	0,091	0,112	0,123	0,128	0,135	0,145	0,151	0,171	0,198
7				0,070	0,082	0,102	0,111	0,116	0,122	0,131	0,137	0,155	0,179
8				0,064	0,075	0,093	0,102	0,106	0,112	0,120	0,126	0,143	0,165
9						0,087	0,095	0,099	0,104	0,112	0,117	0,133	0,153
10								0,093	0,098	0,105	0,110	0,125	0,144
11									0,093	0,099	0,104	0,118	0,136
12										0,095	0,099	0,112	0,130
13											0,095	0,107	0,124
14											0,091	0,103	0,119
15												0,099	0,114
16													0,110
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Multi-Tooth Threads, Internal

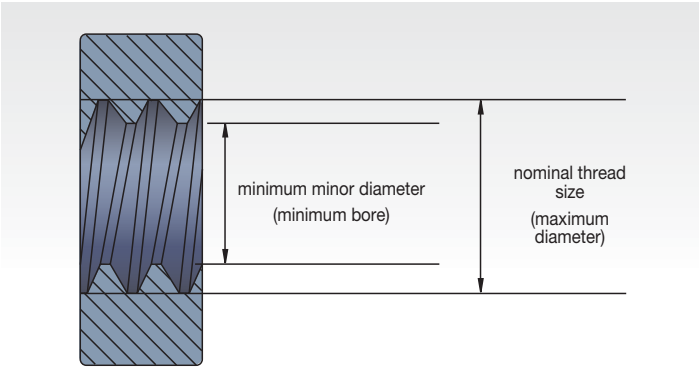
	ISO metric						ISO UN					Whitworth	NPT		
type	3M	2M	3M	2M	3M	2M	2M	3M	2M	3M	2M	2M	2M	3M	2M
pitch (mm)	1,0	1,5	1,5	2,0	2,0	3,0	—	—	—	—	—	—	—	—	—
TPI	—	—	—	—	—	—	16	16	12	12	8	11	11.5	11.5	8
total depth (mm)	0,609	0,838	0,838	1,168	1,168	1,778	0,939	0,939	1,245	1,245	1,880	1,575	1,753	1,753	2,540
pass 10mm	0,330	0,381	0,508	0,508	0,711	0,558	0,431	0,558	0,558	0,762	0,584	0,736	0,584	0,812	0,889
2	0,279	0,254	0,330	0,381	0,457	0,482	0,304	0,381	0,406	0,482	0,508	0,482	0,508	0,558	0,635
3	—	0,203	—	0,279	—	0,431	0,203	—	0,279	—	0,431	0,355	0,355	0,381	0,558
4	—	—	—	—	—	0,304	—	—	—	—	0,355	—	0,304	—	0,457

Recommendations for Steel Workpieces (<300 BHN)

			total depth — on radius		
catalogue number	insert size	TPI profile	1st pass	2nd pass	3rd pass
NTC-8R/L8EM	8	8 UN	1,21	1,63	2,00
NTC-8R/L8IM	8	8 UN	1,19	1,55	1,88
NTC-8R/L10EM	8	10 UN	0,92	1,27	1,60
NTC-8R/L10IM	8	10 UN	0,90	1,22	1,52
NTC-8R/L12EM	8	12 UN	0,76	1,04	1,32
NTC-8R/L12IM	8	12 UN	0,76	0,93	1,20
NTC-8R/L14EM	8	14 UN	0,68	0,95	1,12
NTC-8R/L14IM	8	14 UN	0,60	0,78	1,04
NTC-8R/L16EM 8	8	16 UN	0,58	0,81	0,96
NTC-8R/L16IM	8	16 UN	0,50	0,68	0,93
NTC-8R/L18EM	8	18 UN	0,48	0,66	0,86
NTC-8R/L18IM	8	18 UN	0,48	0,60	0,83
NDC-68RDR/L-75M	8	8 round	1,47	1,65	1,85
NDC-61RDR/L-75M	8	10 round	1,11	1,29	1,45
NDC-88RDRD/L-75M	8	8 round	1,29	1,75	1,85
NDC-88VR/L-75M	8	8 NPT	1,01	1,72	2,45
NDC-8115VR/L-75M	8	11.5 NPT	0,96	1,37	1,70
NDN-814VR/L-75M	8	14 NPT	0,96	1,22	1,36

TopThread™

The following charts list the largest thread pitch that can be applied on internal applications using TopThread threading inserts for 60° V-threading and Acme threading.



Metric-sized 60° V-Threading Limits

internal threading limitations NT-1, NT-2 60° V-threading inserts

TPI	nominal thread size		minimum thread diameter (inch)	
	NT-1	NT-2	NT-1	NT-2
4,00	M48 x 4.00	–	43,67	–
3,00	M42 x 3.00	–	38,75	–
2,50	M39 x 2.50	M24 x 2,50	36,29	21,29
2,00	M33 x 2.00	M15 x 2,00	30,84	12,84
1,75	M32 x 1.75	M15 x 1,75	30,11	13,11
1,50	M32 x 1.50	M15 x 1,50	30,38	13,38
1,25	M29 x 1.29	M14 x 1,25	27,65	12,65
1,00*	M27 x 1.00	M14 x 1,00	25,92	12,92
0,75	M22 x 0.75	M12 x 0,75	21,19	11,19

**Thread pitch of 1mm and less can be cut with an NT-2 insert provided the core thread diameter is 25mm or larger (11mm or larger with NT-1).*

Internal threading limitations NT-3 and NT-4 60° V-threading inserts

TPI	nominal thread size	minimum thread diameter (mm)
6,00**	M76 x 6.00	69,50
5,50**	M73 x 5.50	67,05
5,00	M70 x 5.00	64,59
4,00	M64 x 4.00	59,67
3,00	M52 x 3.00	48,75
2,50	M48 x 2.50	45,29
2,00	M42 x 2.00	39,84
1,75	M40 x 1.75	38,11
1,50*	M38 x 1.50	36,38

**Thread pitch of 1,5mm and less can be cut provided core thread diameter is 35mm or larger.*
***NT-4-insert only.*

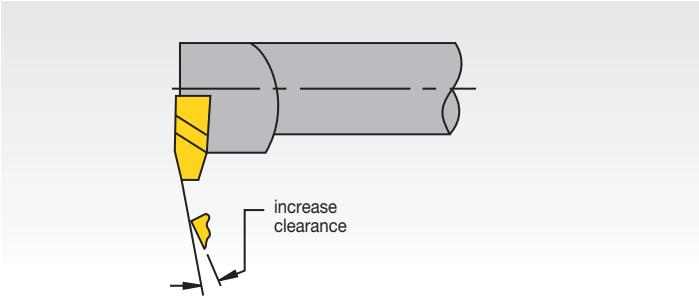
NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Acme Threading Limits

internal threading limitations NA and NAS-2, -3, -4, and -6 Acme threading inserts

TPI	nominal thread size	minimum thread diameter (mm)	
	NT-1	NT-1	NT-2
2**	5	4.500	114.3
2-1/2**	4-1/2	4.100	104.1
3**	4	3.665	93.1
4	3-1/2	3.250	82.6
5	3	2.800	71.1
6	2-1/2	2.333	59.3
8	2-1/4	2.125	54.0
10	2	1.900	48.3
12	1-3/4	1.667	42.4
14	1-5/8	1.554	39.5
16*	1-1/2	1.438	36.5

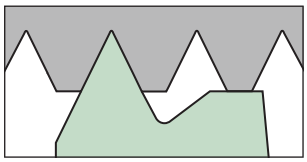
**Sixteen threads per inch and finer can be cut provided minor diameter is 36,5mm or larger.*
***NA-6 insert only.*



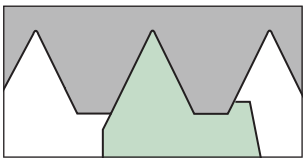
Additional secondary clearance can be ground on leading edge of insert to provide sufficient helical clearance for machining coarser threads and multiple start threads. Modified standard inserts may be furnished for machining threads outside of the limits shown.

TopThread™

60° V-Thread Crest Turning Application Data



NTC crest turning insert for (P ≤ 2mm) and finer.



NTC crest turning insert for (P ≥ 3mm) and coarser.

NOTE: NTC inserts automatically control root to crest dimensions. Therefore, in setting up threading operations with NTC inserts, check the O.D. or I.D. at the thread crest for correct dimensions.

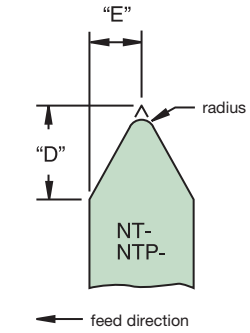
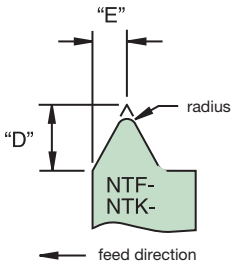
60° V-Thread Crest Turning Application Data

insert catalogue number	nose radius on insert (mm)	thread radius per MIL-S-8879A (mm)
NJ-3014R/L12	0,317/0,342	0,317/0,381
NJK-3008R/L20	0,190/0,215	0,190/0,0228

"J" thread note for catalog

The controlled root radius thread form (SAE8879C) is defined for the external thread only. To machine the corresponding internal thread, choose any insert that will cut a unified class 2B thread, then bore the minor diameter to size. Refer to SAE8879C and MIL-S-8879C and SAEAS8879D for the correct "J" thread minor diameter values.

60° V-Thread Application Data

insert description	insert	D (mm)	E (mm)	recommended TPI*		recommended TP*	
				external	internal	external	internal
	NT-1	1,90	1,11	–	24–12	–	1,00–2,00
	NT-2	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NT-2-K	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NTF-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTK-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTP-2	28,70	1,90	36–8	20–7	0,70–3,0	1,25–3,50
	NT-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-K	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-C	37,59	2,46	11–6	6 (only)	2,50–4,00	4,00 (only)
	NT-3-CK	37,59	2,46	11–6	6 (only)	2,50–4,00	4,00 (only)
	NTF-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-K	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-C	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NT-4-CK	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NTF-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25

**Based on maximum insert radius size and class 2A and 2B thread specifications.*

TopThread™

API Thread Forms • Insert Applications Chart for API Rotary Shouldered Connections

thread form	WIDIA™ insert		tool joint application	minimum box size*
	cresting	non-cresting		
V-.038R 2" TPF 4 TPI	NDC-4038R/L2 4-E/IR4API382	ND-3038R/L	2-3/8 API internal flush 2-7/8 API internal flush 3-1/2 API internal flush 4 API internal flush 4-1/2 API internal flush 5-1/2 API internal flush 6-5/8 API internal flush 4 API full hole API #23, API #26, API #31, API #35, API #38, API #40, API #44, API #46, API #50	API #31 2-7/8 IF
V-.038R 3" TPF 4 TPI	NDC-4038R/L3 4-E/IR4API383	ND-3038R/L	API #56 API #61 API #70 API #77	API #56
V-.050 2" TPF 4 TPI	NDC-4050R/L2 4-E/IRAPI502	ND-4050R/L	5-1/2 API full hole 6-5/8 API regular 6-5/8 API full hole	5-1/2 API full hole
V-.050 3" TPF 4 TPI	NDC-4050R/L3 4-E/IR4API503	ND-4050R/L	5-1/2 API regular 7-5/8 API regular 8-5/8 API regular	5-1/2 API regular
V-.040 3" TPF 5 TPI	NDC-3040R/L3 NDC-4040R/L3 4-E/IR5API403	ND-3040R/L ND-4040R/L	2-3/8 API regular 2-7/8 API regular 3-1/2 API regular 4-1/2 API regular	3-1/2 API regular

**Minimum box size that can be threaded with a standard TopThread insert due to minimum bore equipment.*

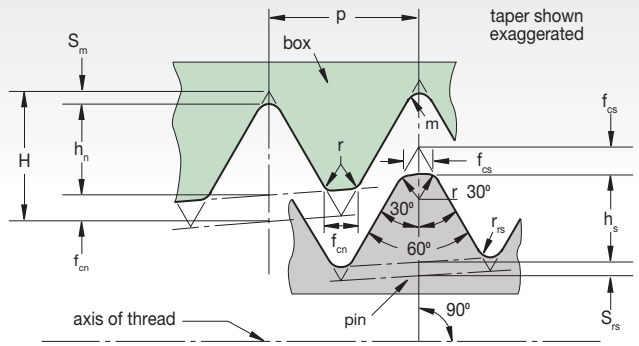
API Thread Forms

Product Thread Dimensions • Rotary Shouldered Connections (Inch)

threadform	taper inch per ft.	thread height, not truncated H	thread height, truncated $h_n=h_s$	root truncation $S_m=S_{rs}$ $f_m=f_{rs}$	crest truncation $f_{cn}=f_{cs}$	width of flat		root radius $r_m=r_{rs}$	radius at thread corners r	pitch p
						crest $f_{cn}=f_{cs}$	crest $f_m=f_{rs}$			
V-.038R	2	.216005	.121844	.038000	.056161	.065	—	.038	.015	.250
V-.038R	3	.215379	.121381	.038000	.055998	.065	—	.038	.015	
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTE: All dimensions in inches.

V-.040 and V-.050 Product Thread Form

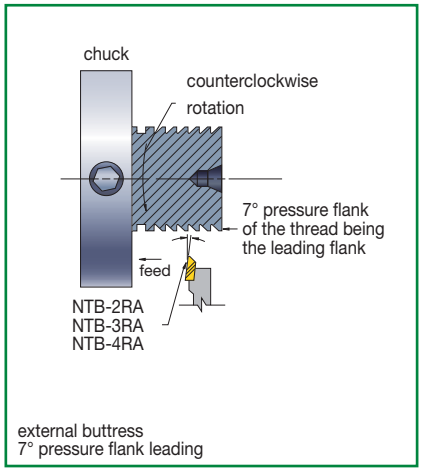


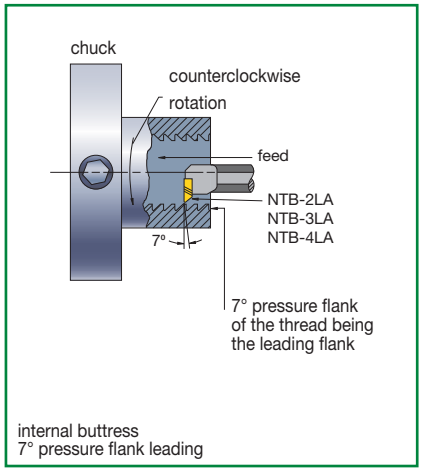
Casing and Tubing Round Thread (Height Dimensions)

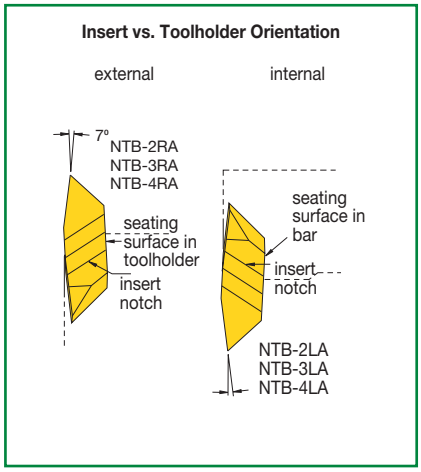
thread element		10 TPI p= .1000	8 TPI p= .1250
H	= .866p	.08660	.10825
$H_s = h_n$	= .626p - .007	.05560	.07125
$S_{rs} = S_m$	= .120p + .002	.01400	.01700
$S_{cs} = S_{cn}$	= .120p + .005	.01700	.02000

TopThread™

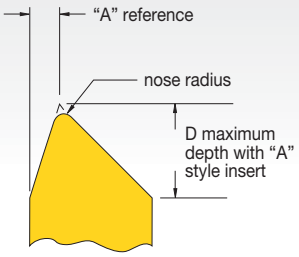
American Buttress (7° Pressure Flank Leading) NTB-A Inserts • Push Type







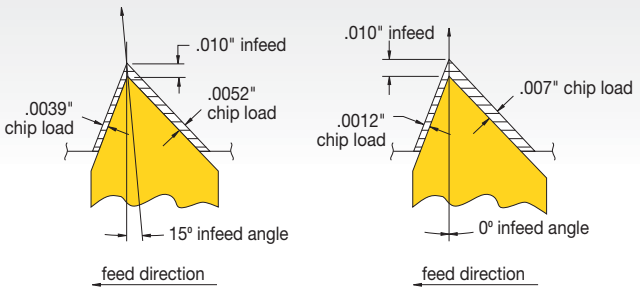
Reference Dimensions



insert	D (inch)	"A" ref. (inch)	nose radius (inch)	pitch based on maximum radius
NTB-2A	.133	.024	.002–.004	16–20 TPI
NTB-3A	.171	.031	.005–.008	8–16 TPI
NTB-4A	.218	.049	.008–.012	4–6 TPI

NOTE: For balanced chip load, 15° infeed angle is suggested.

Infeed Angle vs. Chip Load: 7° Pressure Flank Leading



NTB-A insert

Internal Threading Limitations

internal threading limitations
NTB-2A Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations
NTB-3 and NTB-4A Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4*	2-1/2	2.200
5	2-1/4	2.010
6	2	1.800
8	1-3/4	1.600
10	1-5/8	1.505
12**	1-1/2	1.400

**NTB-4A insert only.*
***Can cut 16 or 20 threads per inch provided minor diameter is 1.375" or larger.*

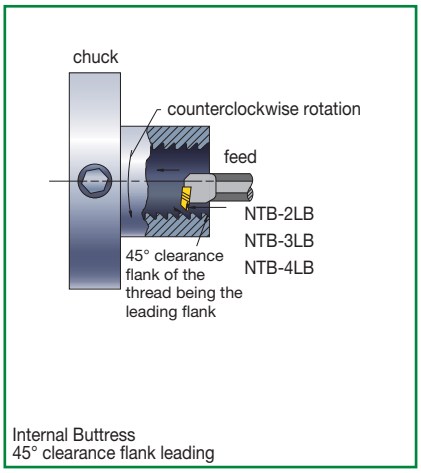
Threads per Inch vs. Maximum Root Radius Chart (Inch)

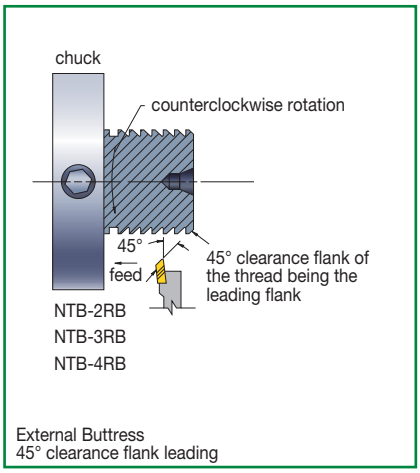
TPI	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
maximum root radius	.0036	.0045	.0059	.0071	.0089	.0119	.0143	.0179	.0238	.0268	.0375	.0476	.0572	.0714

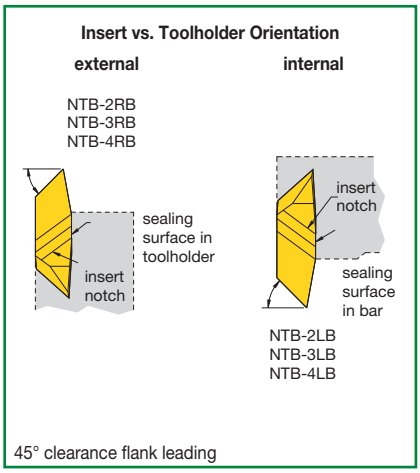
NOTE: Special buttress forms are available upon request.

TopThread™

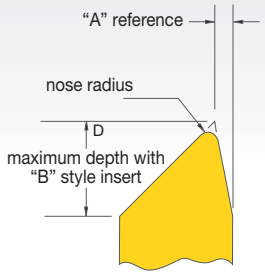
American Buttress (45° Clearance Flank Leading): NTB-B Inserts • Pull Type



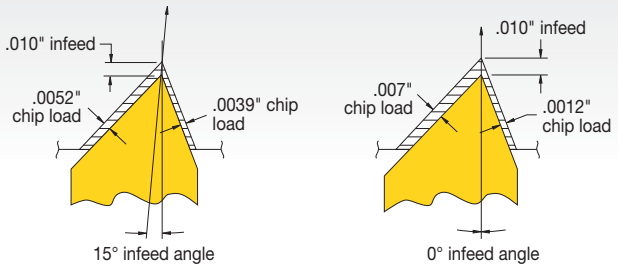




Reference Dimensions



Infeed Angle vs. Chip Load: 45° Clearance Flank Leading



NTB-B insert

insert	D (inch)	"A" reference (inch)	nose radius (inch)	pitch based on maximum radius
NTB-3B	.171	.031	.005–.004	8–16 TPI

NOTE: For balanced chip load, a reverse 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations
NTB-2B Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations
NTB-3 and NTB-4B Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4*	2-7/8	2.575
5	2-3/4	2.510
6	2-3/8	2.175
8	2-1/8	1.975
10	1-7/8	1.755
12	1-5/8	1.525
16	1-1/2	1.407
20	1-7/16	1.378

**NTB-4B insert only.*

External Laydown Threading

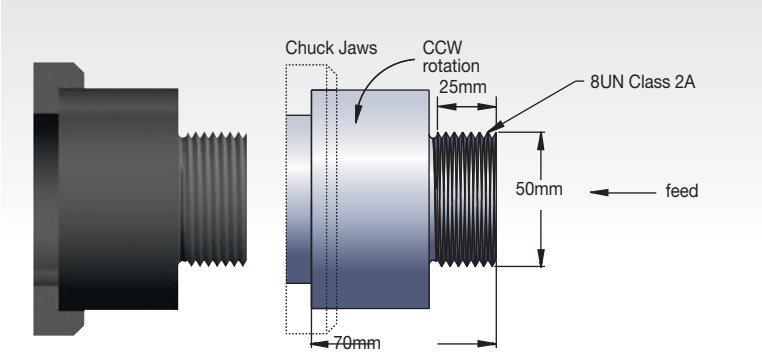
Required Information

From Part Drawing:

material:	316SS, 200 HB
thread form:	8UN Class 2A
operation:	external threading
pitch diameter:	50mm x 25mm deep

From Machine Set-Up Data:

tooling:	20mm x 20mm
spindle rotation:	counter-clockwise
feed:	toward chuck

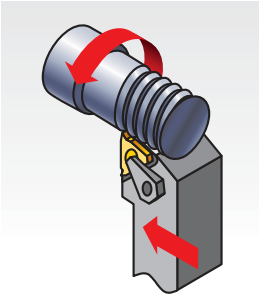


Steps for a Successful Threading Operation

Step 1 • Determine Threading Method

Need to Know:

- Operation (external).
- Spindle rotation (CCW). Counterclockwise rotation.
- Feed direction (toward chuck).
- Right-hand toolholder.
- Right-hand insert (ER).
- Standard helix method.



Step 2 • Select Insert

Need to Know:

- Thread form (ISO R262 1mm pitch).
- Hand of insert (right hand — ER).

Choose the High-Performance Solution

catalogue number	insert size	TN6025
3ER10ISO	3	•

High-Performance Selection

NOTE: Use insert with largest insert size available.

insert:	*3ER10ISO*
grade:	*TN6025*
speed:	*150 m/min*

Step 3 • Select the Grade and Speed

Need to Know:

- Workpiece material (316SS-200HB).
- Operation (external).

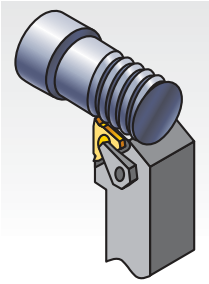
Options: Grade and Speed Selection Guidelines

threading operation	stainless steel
external	general purpose and high performance
	KC6025
	30–360 SFM

Step 4 • Select Toolholder

Need to Know:

- External or internal operation (external).
- Pitch diameter to determine minimum bore diameter (N/A).
- Type of tooling — toolholder, boring bar (toolholder).
- Hand of tool (right hand).
- Insert size (16).



Options:

catalogue number	insert size	shim
AL203R	3	SM-YE3

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (8 TPI).
- Pitch diameter (50mm).
- Helix method (standard). See Laydown Threading (LT) shim selection chart.

Select SM-YE3 shim

NOTE: For this application, the standard shim supplied should be replaced with the recommended shim, SM-YE3.

Internal Laydown Threading

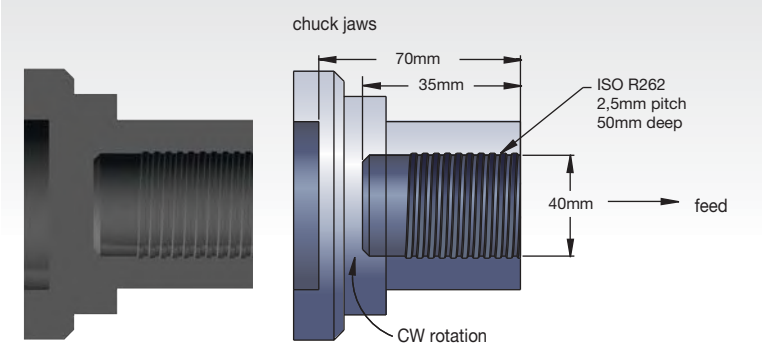
Required Information

From Part Drawing:

material:	4140 steel
thread form:	ISO R262 2,5mm pitch
operation:	internal threading
pitch diameter:	40mm x 35mm deep

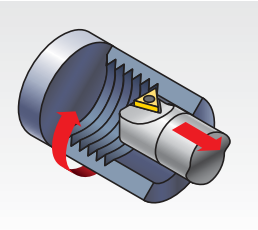
From Machine Set-Up Data:

tooling:	20mm boring bar
spindle rotation:	clockwise
feed:	away from chuck



Steps for a Successful Threading Operation

Step 1 • Determine Threading Method



Need to Know:

- Operation (internal).
- Spindle rotation (CW). Clockwise rotation.
- Feed direction (away from chuck).
- Left-hand toolholder.
- Left-hand insert (NL).
- Reverse helix method.

Step 2 • Select Insert

Need to Know:

- Thread form (ISO Metric Class 6G/6H).
- Hand of insert (left hand — NL).

Choose the High-Performance Solution

catalogue number	insert size	TN6025
3IL25ISO	3	•

High-Performance Selection

NOTE: Use insert with largest possible insert size to go into the bore.

insert: 3IL25ISO
grade: TN6025
speed: 130 m/min

Step 3 • Select the Grade and Speed

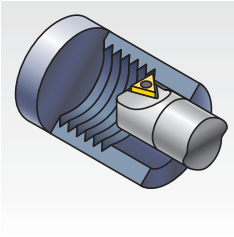
Need to Know:

- Workpiece material (4010 steel).
- Operation (internal).

Options: Grade and Speed Selection Guidelines

threading operation	steel
internal	general purpose and high performance
	TN6025
	40–200 m/min

Step 4 • Select Toolholder



Need to Know:

- External or internal operation (internal).
- Pitch diameter to determine minimum bore diameter for internal operations (40mm).
- Type of tooling — toolholder, boring bar (boring bar).
- Hand of tool (left hand).
- Insert size (16).

Options:

catalogue number	insert size	shim
AVR32D3R	3	SM-YE3

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (2,5mm pitch).
- Pitch diameter (40mm).
- Helix method (reverse). See Laydown Threading (LT) shim selection chart.

Select SM-YE3-2N

NOTE: For this application, the standard shim supplied should be replaced with the recommended shim, SM-YE3.

Laydown Threading

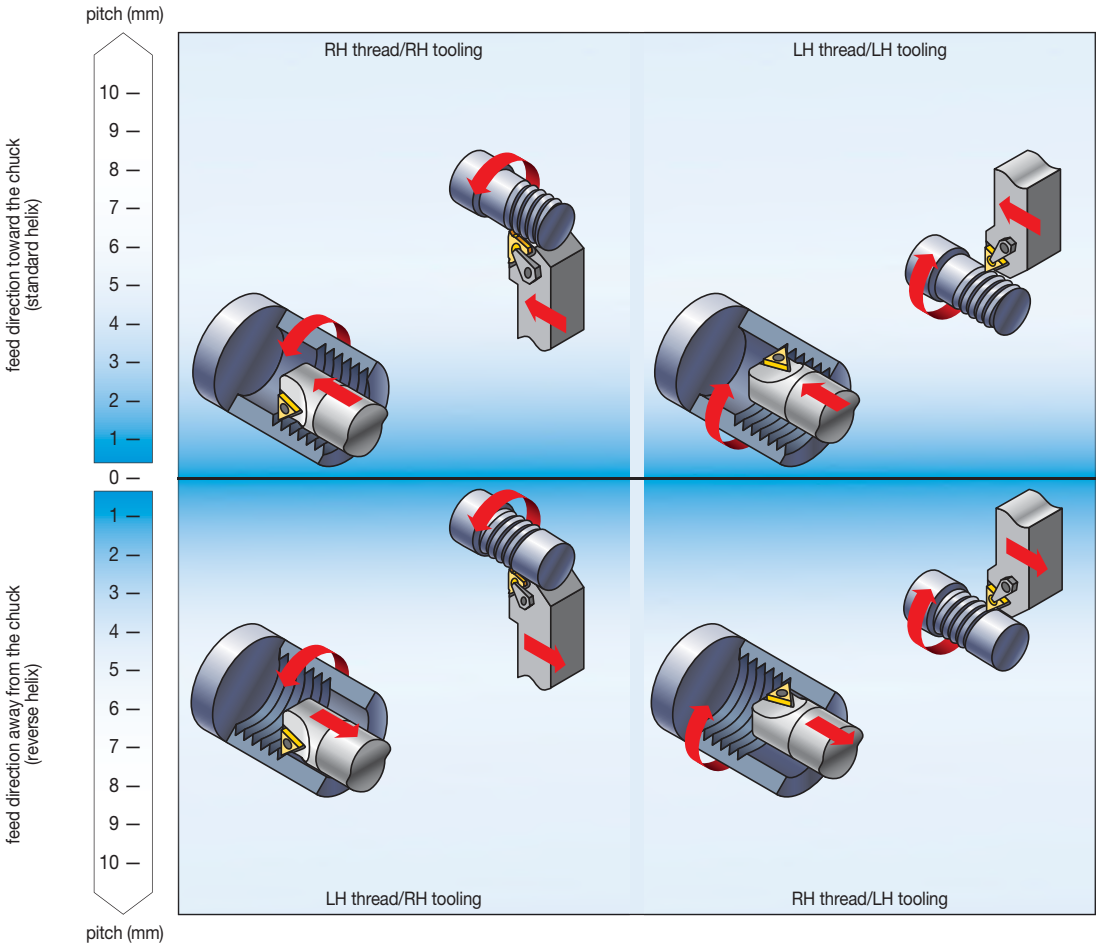
Laydown Threading Shim Selection Guidelines

It is essential to select the correct shim to ensure thread quality and maximum tool life.
These parameters are needed:

- Pitch
- Pitch diameter
- Number of starts
- Feed direction

NOTE: When considering method of thread cutting, the part's shape and stability and the flow of chips are determining factors in your decision.

Laydown Selection Chart



NOTE: For multi-start threads, use the lead value instead of the pitch.

Diagram of Thread Lead Angles

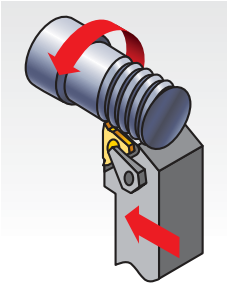
To calculate the lead angle of a given thread, use this formula:

$$ß = \text{Arctan} \frac{P \bullet S}{\pi D_e}$$

ß = thread lead angle
D_e = effective pitch diameter of thread wear
P = 1/TPI
TPI = threads per inch
S = number of starts
single-start, lead = pitch
multiple-start, lead = pitch (x) number of starts

All toolholders are designed with an inclination angle = 1.5°. When turning standard threads with a lead angle of 1–2°, this guarantees adequate clearance at the flanks of the insert's thread tooth. The thread lead angle and the required inclination angle of the insert are given by ß.

Cutting edge height is constant at every shim and insert combination. All toolholders are supplied with 1-1/2° lead angle.



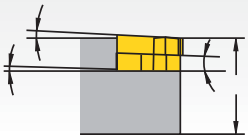
Laydown Threading

Laydown Threading Shim Selection Table • Metric

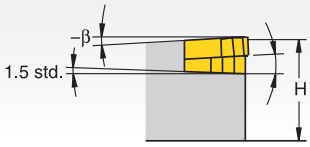
insert size	toolholder external	toolholder internal	shim ordering code (mm)							
						standard				
3 (9,52)	RH	LH	SM–YE3–3P	SM–YE3–2P	SM–YE3–1P	SM–YE3	SM–YE3–1N	SM–YE3–1.5N	SM–YE3–2N	SM–YE3–3N
3 (9,52)	LH	RH	SM–YI3–3P	SM–YI3–2P	SM–YI3–1P	SM–YI3	SM–YI3–1N	SM–YI3–1.5N	SM–YI3–2N	SM–YI3–3N
4 (12,7)	RH	LH	SM–YE4–3P	SM–YE4–2P	SM–YE4–1P	SM–YE4	SM–YE4–1N	SM–YE4–1.5N	SM–YE4–2N	SM–YE4–3N
4 (12,7)	LH	RH	SM–YI4–3P	SM–YI4–2P	SM–YI4–1P	SM–YI4	SM–YI4–1N	SM–YI4–1.5N	SM–YI4–2N	SM–YI4–3N
TPI		pitch (mm)	pitch diameter (mm)							
72		–	–	–	–	3,1–8	8–21,4	>21,4	21,4–8	8–3,1
–		0,35	–	–	–	3,0–8	8–21,3	>21,3	21,3–8	3–8
64		–	–	–	–	3,4–9	9–24,1	>24,1	24,1–9	9–3,4
–		0,40	–	–	–	3,5–9,1	9,1–24,3	>24,3	24,3–9,1	9,1–3,5
56		0,45	–	–	–	3,9–10,3	10,3–27,6	>27,6	27,6–10,3	10,3–3,9
–		0,50	–	–	2,8–4,3	4,3–11,4	11,4–30,4	>30,4	30,4–11,4	11,4–4,3
48		–	–	–	3–4,6	4,6–12,1	12,1–32,2	>32,2	32,2–12,1	12,1–4,6
44		–	–	–	3,3–5	5–13,2	13,2–35,1	>35,1	35,1–13,2	13,2–5
–		0,60	–	2,6–3,4	3,4–5,2	5,2–13,7	13,7–36,5	>36,5	36,5–13,7	13,7–5,2
40		–	–	2,8–3,6	3,6–5,5	5,5–14,5	14,5–38,6	>38,6	38,6–14,5	14,5–5,5
–		0,70	–	3,0–4	4–6,1	6,1–16	16–42,6	>42,6	42,6–16	16–6,1
36		–	–	3,1–4	4–6,1	6,1–16,1	16,1–42,9	>42,9	42,9–16,1	16,1–6,1
–		0,75	2,8–3,2	3,3–4,3	4,3–6,5	6,5–17,1	17,1–45,6	>45,6	45,6–17,1	17,1–6,5
32		–	3–3,4	3,4–4,5	4,5–6,9	6,9–18,1	18,1–48,3	>48,3	48,3–18,1	18,1–6,9
–		0,80	3–3,5	3,5–4,6	4,6–6,9	6,9–18,2	18,2–48,6	>48,6	48,6–18,2	18,2–6,9
28		–	3,4–3,9	3,9–5,2	5,2–7,9	7,9–20,7	20,7–55,1	>55,1	55,1–20,7	20,7–7,9
27		–	3,6–4,1	4,1–5,4	5,4–8,2	8,2–21,4	21,4–57,2	>57,2	57,2–21,4	21,4–8,2
–		1,00	3,8–4,3	4,3–5,7	5,7–8,7	8,7–22,8	22,8–60,8	>60,8	60,8–22,8	22,8–8,7
24		–	4–4,6	4,6–6	6–9,2	9,2–24,1	24,1–64,3	>64,3	64,3–24,1	24,1–9,2
–		1,25	4,7–5,4	5,4–7,1	7,1–10,8	10,9–28,5	28,5–76	>76,0	76–28,5	28,5–10,8
20		–	4,8–5,5	5,5–7,2	7,2–11	11–28,9	29–77,2	>77,2	77,2–28,9	29–11
18		–	5,3–6,1	6,1–8	8–12,2	12,2–32,2	32,2–85,8	>85,8	85,8–32,2	32,2–12,2
–		1,50	5,7–6,5	6,5–8,5	8,5–13	13–34,2	34,2–91,2	>91,2	91,2–34,2	34,2–13
16		–	6–6,9	6,9–9	9–13,8	13,8–36,2	36,2–96,5	>96,5	96,5–36,2	36,2–13,8
–		1,75	6,6–7,96	7,6–10	10–15,2	15,2–39,9	39,9–106,4	>106,4	106,4–39,9	39,9–15,2
14		–	6,9–7,9	7,9–10,3	10,3–15,7	15,7–41,4	41,4–110,3	>110,3	110,3–41,4	41,4–15,7
13		–	7,4–8,5	8,5–11,1	11,1–17	17–44,5	44,5–118,8	>118,8	118,8–44,5	44,5–17
–		2,00	7,6–8,7	8,7–11,4	11,4–17,4	17,4–45,6	45,6–121,6	>121,6	121,6–45,6	45,6–17,4
12		–	8–9,2	9,2–12	12,1–18,4	18,4–48,2	48,3–128,7	>128,7	128,7–48,2	48,2–18,4
11.5		–	8,4–9,6	9,6–12,6	12,6–19,2	19,2–50,3	50,3–134,3	>134,3	134,3–50,3	50,3–19,2
11		–	8,8–10	10–13,1	13,1–20	20–52,6	52,6–140,4	>140,4	140,4–52,6	52,6–20
–		2,50	9,5–10,8	10,8–14,2	14,2–21,7	21,7–57	57–152	>152,0	152–57	57–21,7
10		–	9,6–11	11–14,5	14,5–22	22–57,9	57,9–154,4	>154,4	154,4–57,9	57,9–22
9		–	10,7–12,2	12,2–16,1	16,1–24,5	24,5–64,3	64,3–171,6	>171,6	171,6–64,3	64,3–24,5
–		3,00	11,4–13	13–17,1	17,1–26	26–68,4	68,4–182,4	>182,4	182,4–68,4	68,4–26
8		–	12–13,8	13,8–18,1	18,1–27,6	27,6–72,4	72,4–193	>193,0	193–72,4	72,4–27,6
–		3,50	13,3–15,2	15,2–19,9	19,9–30,4	30,4–79,8	79,8–212,8	>212,8	212,8–79,8	79,8–30,4
7		–	13,8–15,7	15,7–20,7	20,7–31,5	31,5–82,7	82,7–220,6	>220,6	220,6–82,7	82,7–31,5
–		4,00	15,2–17,3	17,3–22,8	22,8–34,7	34,7–91,2	91,2–243,2	>243,2	243,2–91,2	91,2–34,7
6		–	16–18,3	18,3–24,1	24,1–36,7	36,7–96,5	96,5–257,4	>257,4	257,4–96,5	96,5–36,7
–		5,00	19–21,7	21,7–28,5	28,5–43,4	43,4–114	114–304	>304,0	304–114	114–43,4
5		–	19,3–22	22–28,9	28,9–44,1	44,1–115,8	115,8–308,8	>308,8	308,8–115,8	115,8–44,1
4,5		–	21,4–24,5	24,5–32,1	32,1–49	49–128,7	128,7–343,1	>343,1	343,1–128,7	128,7–49
–		6,00	22,7–26	26–34,2	34,2–52,1	52,1–136,8	136,8–364,8	>364,8	364,8–136,8	136,8–52,1
4		–	24,1–27,5	27,5–36,2	36,2–55,1	55,1–144,8	144,8–386	>386	386–144,8	144,8–55,1
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			standard helix (feed toward the chuck)						reverse helix (feed away from the chuck)	

1. Select TPI or pitch from the left-hand columns.
2. Follow row to specified pitch diameter and the correct feed direction.
3. Follow the column to the top for the required shim based on the toolholder and insert size.

standard helix method:
Used when RH thread is cut with RH tool or LH thread with LH tool.



reverse helix method:
Used when RH thread is cut with LH tool or when LH thread is cut with RH tool.



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Turning Icons

Shank: KM-TS™ (ISO 26622)	ISO: 26622	Through Coolant: 100 bar	Through Coolant: 100 bar	Turning
Cut-off	I.D. Turning	I.D. Chamfering	I.D. Grooving	I.D. Face Grooving
I.D. Internal Threading	Profiling	Facing	Face Grooving	Back Boring
Threading	Grooving			

Indexable Milling Icons

Countersinking	Face Milling	Helical Milling	Plunge Milling	Ramping Blank
Slotting: Ball Nose	Slotting: Side Milling	Slotting: Side Milling with AE/AP Dimensions	Slotting: Square End	Slotting: T
Side Milling/Shoulder Milling: Ball Nose	Side Milling/Shoulder Milling: Square End	Side Milling: Square End with AE/AP Dimensions	Chamfer Milling	Side Milling: Roughing
3D Profiling	PCD Tool	Pocketing	Plain Shank	Shell Mill Shank
Weldon® Shank	Weldon Shank: 2 Flat	Screw-On Shank	Shank	Through Coolant: Radial: Indexable Milling

Solid End Milling Icons

Plunge Milling	Ramping Blank	Slotting: Ball Nose	Slotting: Ball Nose with AP Dimension	Slotting: Square End
Slotting: Square End with AP Dimension	Trochoidal Milling	Trochoidal Milling: Ball Nose	Side Milling/Shoulder Milling: Ball Nose	Side Milling/Shoulder Milling: Ball Nose with AE/AP Dimension
Side Milling/Shoulder Milling: Square End	Side Milling/Shoulder Milling: Square End with AE/AP Dimension	Chamfer Milling	Chamfer Milling: Chamfer Milling with AE/AP Dimension	3D Profiling
PCD Tool	HSS-PM Material	HSS-M42	Corner Style: Ball Nose	Corner Style: Corner Chamfer
Corner Style: Corner Radius	Corner Style: Square End	Corner Style: Torus	Helix Angle: 0°	Helix Angle: 15°
Helix Angle: 20°	Helix Angle: 25°	Helix Angle: 30°	Helix Angle: 35°	Helix Angle: 37°
Helix Angle: 38°	Helix Angle: 40°	Helix Angle: 45°	Helix Angle: 45°	Helix Angle: 60°
Helix Angle: 43°	DIN 6528	DIN 844	DIN 1835B	DIN 6527
Through Coolant: Radial: Drilling	Through Coolant: Axial: Solid End Mill	Tool Dimensions: Flute Configuration: X (Variable)	Tool Dimensions: Flute Configuration: 1	Tool Dimensions: Flute Configuration: 2
Tool Dimensions: Flute Configuration: 3	Tool Dimensions: Flute Configuration: 4	Tool Dimensions: Flute Configuration: 5	Tool Dimensions: Flute Configuration: 6	Tool Dimensions: Flute Configuration: 7
Manufacturer's Specs: JIS				

Holemaking Icons

Countersinking/ Stroke Chamfering	Drilling	Chain Drilling	Drilling: Cross Hole	Drilling: Half Cylinder
Drilling: Corner Drilling 45°	Drilling: Inclined Entry	Drilling: Inclined Exit	Drilling: Exit Offset	Drilling: Stacked Plates
Drilling: Convex	Drilled Hole	Reaming: Through Hole	Reaming: Blind Hole	Reaming: Through Cross
Reaming: Blind and Cross Holes	Drilling Depth: 3x	Drilling Depth: 5x	Drilling Depth: 8x	Drilling Depth: 12x
Shank: Cylindrical Plain ≤h6	Shank: Cylindrical Whistle Notch 2°	Flat Shank	Shank: Cylindrical with flat	KM™ Shank
Helix Angle 0°	Helix Angle 30°	DIN Number 212	DIN Number 6535	DIN Number 6537
Through Coolant: Radial: Drilling	Through Coolant: Radial: Drilling	Through Coolant: Radial: Indexable Drilling	Flood Coolant: Reaming	Through Coolant: MQL (Minimum Quantity Lubricant): Drilling
Axial: Drilling	Through Coolant: Axial Reaming	Tool Dimensions: 2-Flute/2-Margin/ Coolant	Tool Dimensions: 2-Flute/4-Margin/ Coolant	

Tapping Icons

Tapping: Blind Hole	Threading: Through Hole	Threading: Blind Hole	HSS-E: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness	HSS-E-PM: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness (PM = Power Metal Steel)
HM: (Carbide)	Square Shank	Chamfer Form C (2–3)	Chamfer Form D (3.5–5)	Chamfer Form E (1.5–2)
Plug Chamfer (3–5)	Tapping Helix: Angle: 0°	Tapping Helix: Angle: 10°	Tapping Helix: Angle: L8°	Tapping Helix: Angle: 15°
Tapping Helix: Angle: L15°	Tapping Helix: Angle: 25°	Tapping Helix: Angle: 30°	Tapping Helix: Angle: 42°	Tapping Helix: Angle: 45°
DIN Number 371	DIN Number 374	DIN Number 2174	DIN Number 376	Tapping: Through Coolant
Flood Coolant: Tapping	Through Coolant: Axial: Tapping	ISO 2	Manufacturer's Specs: JIS	Class of Fit: 2B
Class of Fit: 3B	Class of Fit: 6H	Class of Fit: 6HX	Class of Fit: 6G	ANSI
Unified Course Thread: J Profile	Unified Fine Thread: J Profile	Unified Fine Thread	Unified Course Thread	ISO Metric Coarse Thread
ISO Metric Fine Thread				

DIN — German Institute for Standardization

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Material Cross Reference • DIN

P	Steel	N	Non-Ferrous	H	Hardened Materials
M	Stainless Steel	S	High-Temp Alloys	C	CFRP Materials
K	Cast Iron				

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	–
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Austenitic Stainless Steel	–	<600	130–200	–	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	–	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Gray Cast Iron	–	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	GGG40, GTS35
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Wrought Aluminum	–	–	–	–	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSiPb
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12,2%	–	–	–	GAlSiCu4, GDAlSi10Mg
N3	High-Silicon Aluminum Alloys and Magnesium Alloys	Si >12,2%	–	–	–	G-ALSi12, G-AlSi17Cu4, G-AlSi21CuNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	–	–	–	–	LEXAN®, Hostalen™, Polystyrol®, MAKROLON®
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	CFK, GFK
N7	Metal Matrix Composites (MMC)	–	–	–	–	–
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 188, Stellite™ 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Hardened Materials	–	–	–	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Hardox® 400
H2	Hardened Materials	–	–	–	48–55	–
H3	Hardened Materials	–	–	–	56–60	–
H4	Hardened Materials	–	–	–	>60	–
C1	CFRP, CFRP/CFRP	–	–	–	–	–
C2	CFRP/Non-Ferrous	–	–	–	–	–
C3	CFRP/High-Temp	–	–	–	–	–
C4	CFRP/Stainless Steel	–	–	–	–	–
C5	CFRP/Non-Ferrous/High-Temp	–	–	–	–	–

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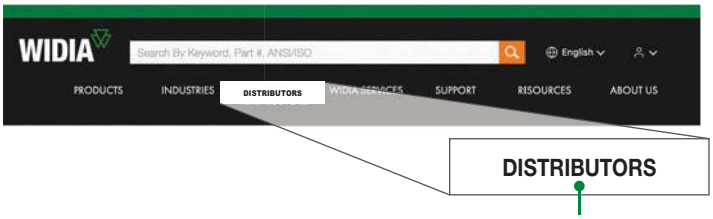

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IMPORTANT SAFETY INSTRUCTIONS: READ BEFORE USING THE TOOLS IN THIS CATALOG

METALCUTTING SAFETY

Projectile and Fragmentation Hazards

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles. Breathing this dust or mist — especially over an extended period — can cause temporary or permanent lung disease or make existing medical conditions worse. Contact with this dust or mist can irritate eyes, skin, and mucous membranes and may make existing skin conditions worse.

To avoid injury:

- Always wear breathing protection and safety goggles when grinding.
- Provide ventilation control and collect and properly dispose of dust, mist, or sludge from grinding.
- Avoid skin contact with dust or mist.

For more information, read the applicable Material Safety Data Sheet provided by WIDIA and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations.

These safety instructions are general guidelines. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation.

For more information, consult the WIDIA Metalcutting Safety booklet, available free from WIDIA at +1 724 539 5747 or fax +1 724 539 5439. For specific product safety and environmental questions, contact our Corporate Environmental Health and Safety Office at +1 724 539 5066 or fax +1 724 539 5372.

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