Indexable Milling

NEW PRODUCTS

Our latest metalcutting innovations are designed to deliver higher productivity, longer tool life, and increased application versatility.

For more information about the latest products and services from WIDIA™, please contact your WIDIA Representative or Authorised WIDIA Distributor, or visit widia.com.

Victory™ Milling Grades

- WP40PM™ — New best-in-class Victory milling grade for machining steel materials in ISO material group P40 in rough milling applications.
- WK15CM™ — New milling grade for cast irons for higher tool life and increased productivity.
- WS30PM™ — A new high-performance milling grade for machining titanium and stainless steels.

VSM11™

- Step down capabilities.
- Effective internal coolant supply for screw-on, end mill, and shell mill cutters.
- The max ramp angle for VSM11 is 10°.

VSM490™

- Four cutting edges on a double-sided strong insert.
- Lower cutting forces; high-positive geometry.
- Excellent wall and surface finish capabilities.
- When using multiple steps, this is a “stepless” solution.

VSM17™

- Depth-of-cut capabilities up to 16,3mm.
- Step down capabilities.
- Effective internal coolant supply for screw-on, end mill, and shell mill cutters.

SuperFeed™

- Protective cutter body.
- Increased flexibility with five PCD cartridge options.
- User-friendly axial adjustment.
- Reconditioning options reduce overall cost.

The Most Advanced Milling Solutions in the Industry

For unsurpassed quality, value, and performance, you can trust WIDIA™ to provide the most comprehensive line of reliable metalcutting tools. Whatever your indexable milling product requirements, be assured that you will find the appropriate solution in this all-inclusive, easy-to-use guide.

For every milling application, workpiece, or equipment need, we offer the best tools on the market, designed to reduce your machining time, provide superior surface finishes, and outperform the competition.

NOVO™

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

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

1. Choose your application:

- Face Mills
- Shoulder Mills
- Helical Mills
- Slotting Mills
- Copy Mills
- Chamfer Mills

2. Identify 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

Tool name

Face Mills

Victory™ M1200 45°

Max depth of cut: 4,5mm

Lead angle: 45°
Indexes per insert: 12
Diameter: 40–315mm

Pages: H30–H37

P M K N S H

Product photo

Informational icons (Connection type and possible operations)

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

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

Location of introduction detail, tool bodies, inserts, and cutting data

Selecting Tool Body, Insert, and Cutting Data

4. Choose the tool body:

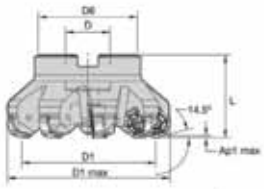
Choose diameter (D1) and pitch (Z) of tool body.

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

Face Mills • Victory™ M1200 Series
Victory M1200 HF • Shell Mills

WIDIA

- Twelve cutting edges.
- High feed rates for rough face milling.
- Use standard M1200 inserts.



■ Shell Mills

order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3750370	M1200HF050Z04HN09	50	67,9	22	36	40	2,2	4	11400	Yes	0,65

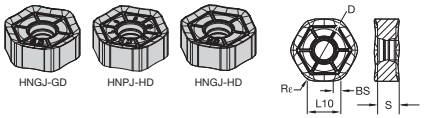
5. Choose the inserts with the WIDIA™ insert selection guide:

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

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

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade 5A	Geometry	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



● first choice
○ alternate choice

	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
P			●	●	●		●		●
M			○	●	○		●	○	●
K	●	○	○	○	○	●	○		
N									
S				●			●	●	○
H							○		

5B

■ HNGJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3110541	3614650	3037596	3093721	5427370	–	5528874	5895349	5895350

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**.

■ Recommended Starting Speeds [SFM]

6A

Material Group		WP25PM			WP35CM			WS30PM			WP40PM			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	–	–	–	–	–	–
	6	200	**150**	120	190	**160**	130	–	–	–	180	**140**	110	–	–	–	–	–	–
M	1	245	**215**	200	245	**220**	185	270	**240**	220	235	**205**	185	–	–	–	–	–	–
	2	220	**190**	155	220	**190**	170	245	**215**	175	210	**180**	150	–	–	–	–	–	–
	3	170	**145**	115	175	**155**	140	185	**160**	125	155	**140**	110	–	–	–	–	–	–
K	1	275	**245**	220	355	**320**	290	–	–	–	–	–	–	–	–	–	–	–	–
	2	215	**190**	180	280	**250**	230	–	–	–	–	–	–	–	–	–	–	–	–
	3	180	**160**	145	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–

6A

■ 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	**0,32**	0,65	0,13	**0,23**	0,47	0,09	**0,17**	0,35	0,08	**0,15**	0,31	0,08	**0,14**	0,28	.F..LDJ
.E..LD	0,17	**0,50**	1,00	0,13	**0,36**	0,72	0,09	**0,27**	0,54	0,08	**0,23**	0,47	0,08	**0,21**	0,43	.E..LD
.S..GD	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..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

6B

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

6B

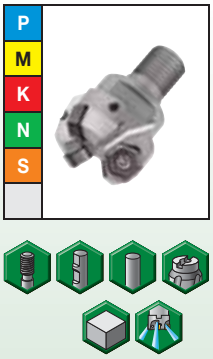
Face Mills

Victory™ M1200 Mini HF 15°

Max depth of cut: 1,7mm

Lead angle: 15°
Indexes per insert: 12
Diameter: 25–80mm

Pages: H5–H11

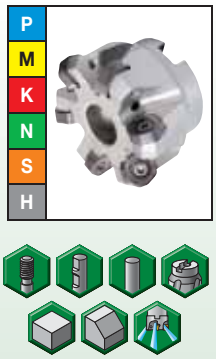


Victory™ M1200 Mini 45°

Max depth of cut: 3,5mm

Lead angle: 45°
Indexes per insert: 12
Diameter: 25–120mm

Pages: H12–H19

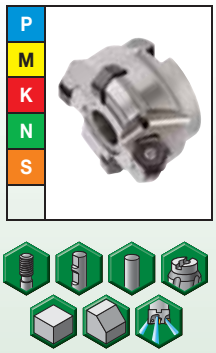


Victory™ M1200 Mini HD 59°

Max depth of cut: 4,7mm

Lead angle: 59°
Indexes per insert: 12
Diameter: 40–125mm

Pages: H20–H23

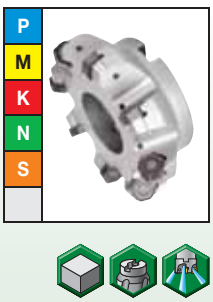


Victory™ M1200 HF 14.5°

Max depth of cut: 2,2mm

Lead angle: 14.5°
Indexes per insert: 12
Diameter: 50–160mm

Pages: H26–H29



Victory™ M1200 45°

Max depth of cut: 4,5mm

Lead angle: 45°
Indexes per insert: 12
Diameter: 40–315mm

Pages: H30–H37

Victory™ M1200 HD 59°

Max depth of cut: 6mm

Lead angle: 59°
Indexes per insert: 12
Diameter: 50–160mm

Pages: H38–H41

(continued)

Face Mills
(continued)

M640

Max depth of cut: 4,8mm

Lead angle: 58°
Indexes per insert: 6
Diameter: 32–125mm

Pages: H44–H49

M660 SN1205..

Max depth of cut: 6,4mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 20–160mm

Pages: H52–H57

M660 SN1505..

Max depth of cut: 8,4mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 100mm

Pages: H58–H60

SuperFeed™

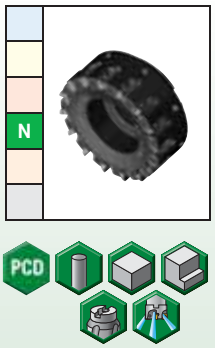
Max depth of cut: 6,35mm
(can be less depending on the cartridge)

Lead angle: 90°

Indexes per insert:
1 edge per PCD cartridge

Diameter: Standard Platform
63–200mm

Pages: H64–H68



M4000
Cartridge Milling System

All front line insert styles available.

Diameter: 125–315mm

Pages: H72–H74

Chamfer Mills

M25™ SD0903..

Max depth of cut: 6,4mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 25–40mm

Pages: I4–I6, I8, I10

M25 SP1204..

Max depth of cut: 8,3mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 50–63mm

Pages: I7, I9–I10

90° Shoulder Mills

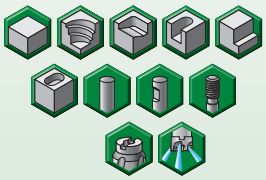
VSM11™

Max depth of cut: 11,7mm

Lead angle: 90°
Indexes per insert: 2
Diameter: 16–125mm

Pages: J4–J16

P M K N S H



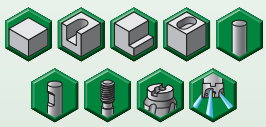
VSM490™-15

Max depth of cut: 15mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 25–160mm

Pages: J32–J40

P M K S



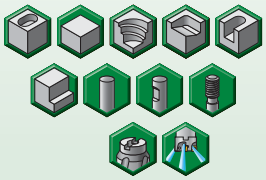
VSM17™

Max depth of cut: 16,33mm

Lead angle: 90°
Indexes per insert: 2
Diameter: 25–160mm

Pages: J20–J29

P M K N S



M690 SD1204..

Max depth of cut: 10mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–160mm

Pages: J44–J47

P M K S H

M690 SD1506..

Max depth of cut: 12mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–125mm

Pages: J48–J51

P M K S H

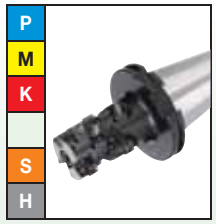
Helical Mills

M390 SD1204...

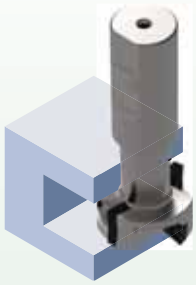
Max depth of cut: 17mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–80mm

Pages: K4–K9



Slotting Mills

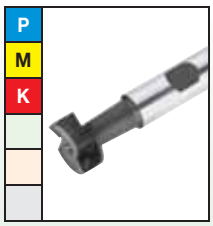


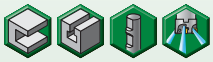
M16

Slot Width Range: 11–21,9mm

Indexes per insert: 2
Diameter: 25–50mm

Pages: L4–L7





M94

Slot Width Range: 1,93–5,23mm

Indexes per insert: 3
Diameter: 25–80mm

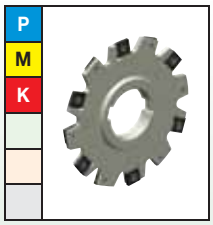
Pages: L10–L14

M95

Slot Width Range: 4–10mm

Indexes per insert: 4
Diameter: 100–200mm

Pages: L18–L21



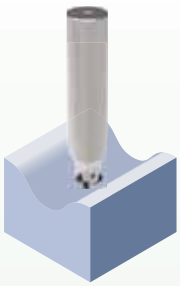
M900™

Slot Width Range: 12–22mm

Indexes per insert: 2
Diameter: 100–315mm

Pages: L24–L30, L32–L33

Copy Mills



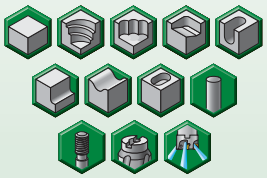
M370™

Max depth of cut: up to 2mm

Indexes per insert: 6
Diameter: 25–125mm

Pages: M4–M16

P M K S H



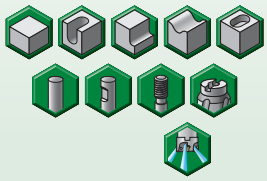
M200™

Max depth of cut: up to 5mm

Indexes per insert: up to 12
Diameter: 25–125mm

Pages: M20–M39

P M K S H



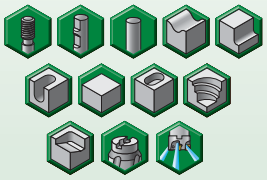
M170™

Max depth of cut: 8mm

Diameter: 12–125mm

Pages: M42–M70

P M K S H



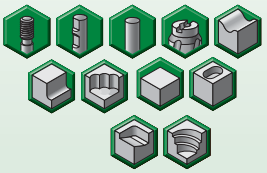
M100™

Max depth of cut: 6mm

Diameter: 24–125mm

Pages: M74–M99

P M K S H



M270™ Ball Nose

Max depth of cut: 5–16mm

Diameter: 10–32mm

Pages: M102–M117

P M K S H

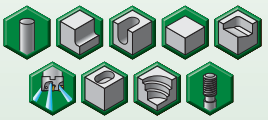
M270 Toroidal

Max depth of cut: 0,3–4mm

Diameter: 10–20mm

Pages: M118–M123

P M K S H



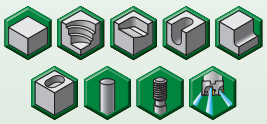
M270 High Feed

Max depth of cut: 0,6–1,1mm

Diameter: 10–20mm

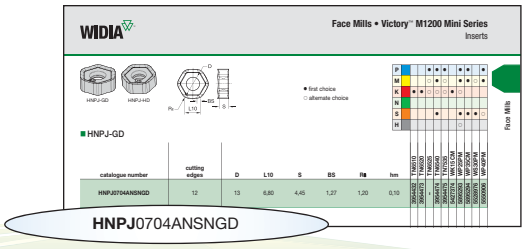
Pages: M124–M130

P M K S H



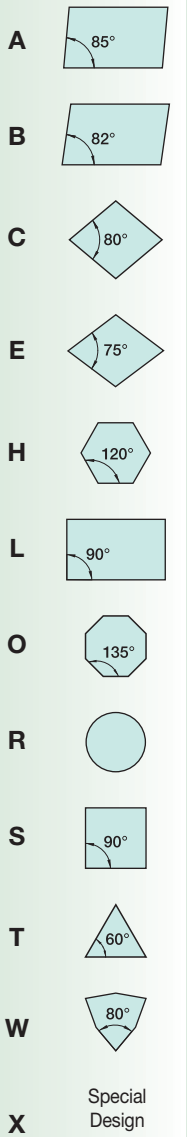
How Do Catalogue Numbers Work?

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



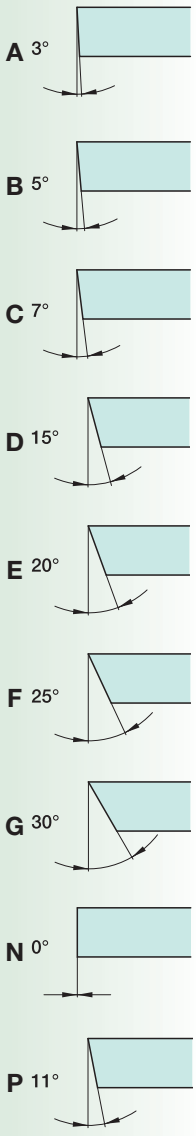
H

Insert Shape



N

Insert Clearance Angle



P

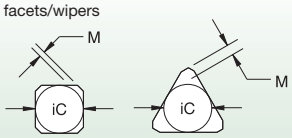
Tolerance Class

J

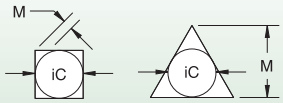
Geometry and Clamping Type

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, 40–60° countersink	without	
T			single-sided	
Q	with	partly cylindrical hole, 40–60° double countersink	without	
U			double-sided	
B	with	partly cylindrical hole, 70–90° countersink	without	
H			single-sided	
C	with	partly cylindrical hole, 70–90° double countersink	without	
J			double-sided	
X	special design			

indexable inserts with facets/wipers



indexable inserts with corner radii



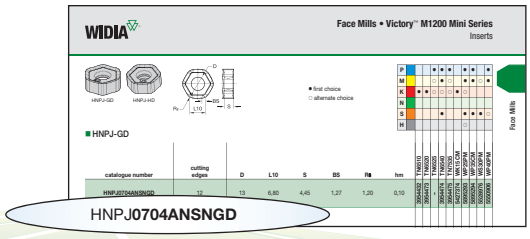
insert thickness

iC	tolerances on "iC"		tolerances on "M"	
	classes J, K, L, M, N (+/–)	class U (+/–)	classes M & N (+/–)	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.*

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.

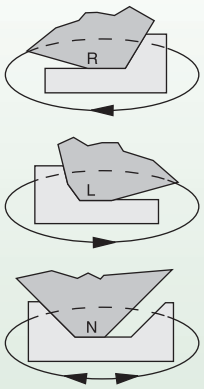


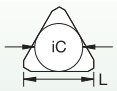
07	04	AN	S	N	GD
Size (Cutting Edge Length)	Insert Thickness	Corner Configuration	Cutting Edge Form	Insert Hand	Edge Geometry

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

F sharp
E honed
T T-land
S honed + T-land

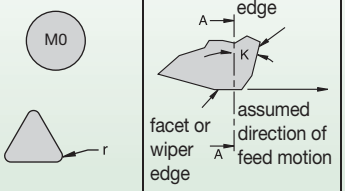
direction of cutter rotation

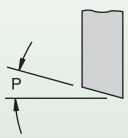




inscribed circle "iC" versus cutting edge length "L"
For shapes A, L, and X, see position #1; use length of leading cutting edge.

	"L" for shapes						
iC	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

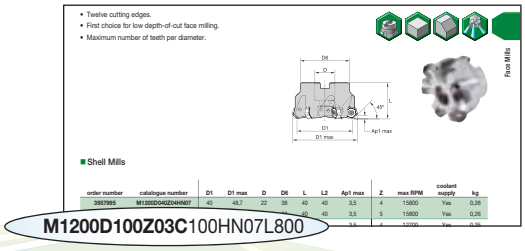
If letter is replaced by number(s), refer to table for radius "r."

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

How Do Catalogue Numbers Work?

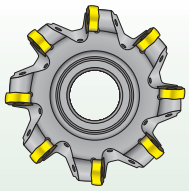
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



Indexable Milling Tool Bodies

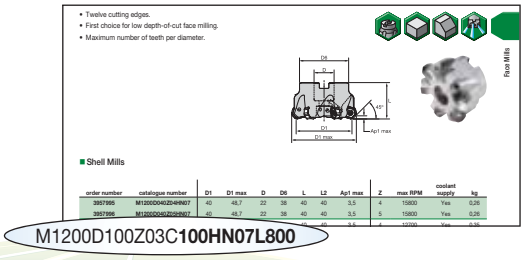
M1200	D	100	Z	03	C
Series	Cutting Diameter		Number of Flutes		Shank Form

Z = Number of effective flutes



C = Cylindrical
W = Weldon®
M = Modular
S = Shell Mill

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



Indexable Milling Tool Bodies

100	H	N	07	L	800
Shank/Pilot Diameter	Insert Shape	Insert Clearance Angle	Insert Size (Cutting Edge Length)	Overall Length of Tool Used for all cylindrical shank and long version Weldon® if required (standard Weldon without)	

Insert Shape

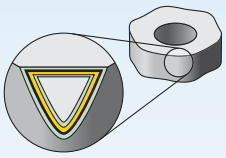
A	85°	M	86°
B	82°	O	135°
C	80°	P	108°
D	55°	R	
E	75°	S	90°
H	120°	T	60°
K	55°	V	35°
L	90°	W	80°
		X	Special Design

Insert Clearance Angle

C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

Optional uses as required

LH	Left Hand
C	Carbide Shank
HM	Heavy Metal Shank

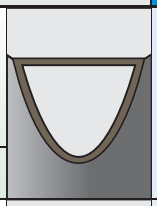
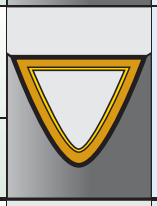
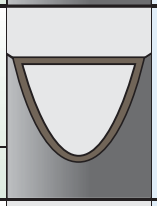
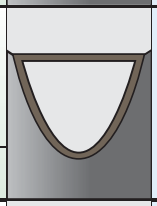
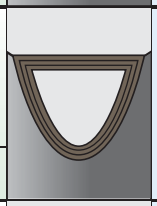
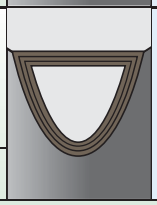


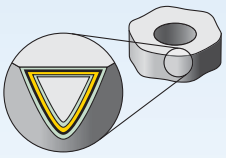
Modern coating technologies provide higher speed capabilities, greater productivity, and longer tool life.

Each insert has a material grid indicating primary and alternate uses for that tool, as well as whether it can be operated dry or with coolant.

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				▼▼				•	•



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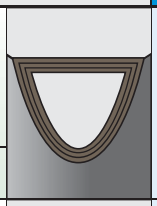
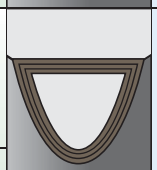
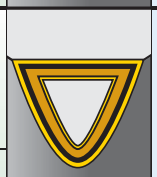
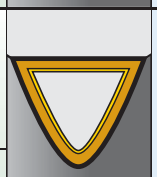
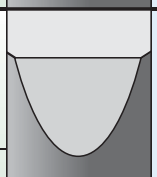
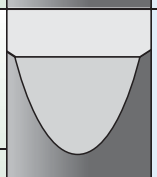
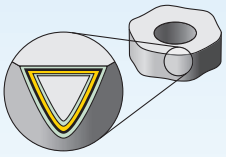
H	Hardened Materials

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

Grade		P	M	K	N	S	H	dry	with coolant
TN6525 HC-P25 • PVD-TiAlN Nanolayer		▼▼	∇∇	∇∇				•	
TN6540 HC-P40 • PVD-TiAlN Nanolayer		▼	▼	∇		▼▼		•	•
TN7525 HC-P25 • MT-CVD/CVD-TiN-TiCN-Al_2O_3-TiN		▼▼	∇∇					•	
TN7535 HC-P35 • MT-CVD/CVD-TiN-TiCN-Al_2O_3		▼	∇	∇				•	
TTI25 HT-P15 • Cermet		▼▼▼	∇∇∇					•	•
THM HW-K15 • Uncoated				∇	▼	∇		•	•



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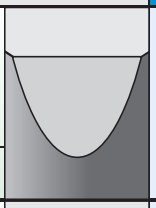
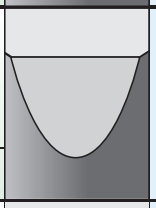
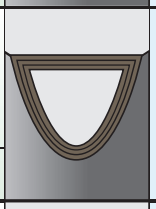
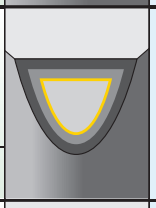
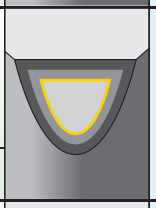
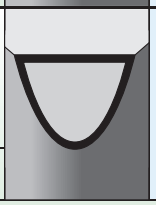
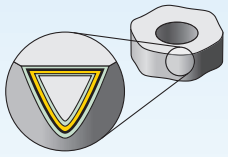
▼▼	Medium	∇∇	Medium
▼	Heavy (roughing)	∇	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
THM-U HF-N05 • Uncoated					▼▼▼			•	•
TTM/TTM08 HW-P25 • Uncoated		▼▼	∇∇	∇∇				•	•
WK15PM PVD-TiAlN Nanolayer				▼▼				•	•
WK15CM™ MT-CVD/TiN-TiCN-Al_2O_3				▼▼				•	
WP20CM MT-CVD/TiN-TiCN-Al_2O_3		▼▼		∇∇					
WP25PM PVD-AlTiN Multilayer		▼▼	▼▼	∇∇		▼▼	∇∇	•	•



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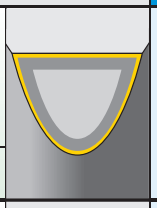
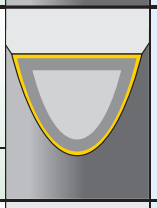
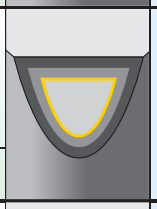
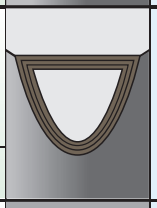
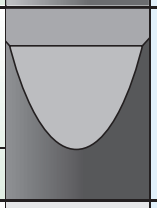
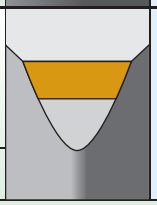
▼▼	Medium	∇∇	Medium
▼	Heavy (roughing)	∇	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
WS30PM™ PVD-AlTiN Multilayer		∇∇	▼▼			▼▼		•	•
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					▼▼▼ ▼▼ ▼				•

Indexable Milling • Face Mills

One Series Meets Every Face Milling Need •

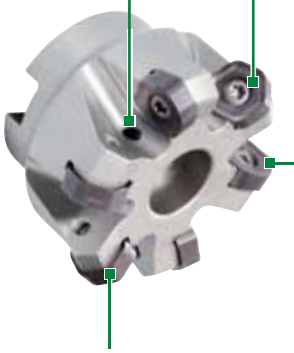
WIDIA™ Victory™ M1200 Mini

For consistent performance, look no further than the WIDIA Victory™ M1200 Mini. This easy-to-use product ensures great tool life, reduced machining time, and maximum productivity.

M1200 Mini

- Low cost per edge and high productivity.
- Reduced cutting forces due to soft cutting action.
- Significantly increased Metal Removal Rates (MRR).
- Victory™ M1200 Mini available in 15°, 45°, and 59° lead.
- WIDIA premium milling grades.
- Excellent tool life in light to heavy machining.
- Shorter machining cycle times.

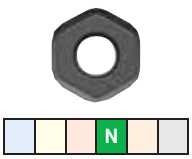
Best-in-class face milling platform to boost productivity on taper 40 spindle milling machines and driven tools.



Comprehensive standard offering for coarse, medium, and fine pitch cutter bodies to match all shop floor needs.

Latest soft cutting edge insert design for all material groups

-FNLDJ



Machining Aluminium

-ENLD

Light Machining

-SNGD

General Purpose

-SNHD

Heavy Machining

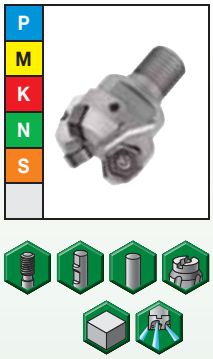
Face Mills

Victory™ M1200 Mini HF 15°

Max depth of cut: 1,7mm

Lead angle: 15°
Indexes per insert: 12
Diameter: 25–80mm

Pages: H5–H11

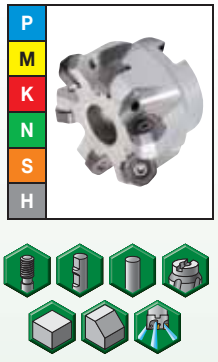


Victory™ M1200 Mini 45°

Max depth of cut: 3,5mm

Lead angle: 45°
Indexes per insert: 12
Diameter: 25–120mm

Pages: H12–H19

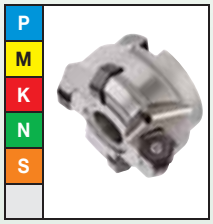


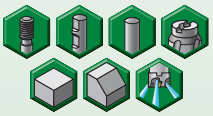
Victory™ M1200 Mini HD 59°

Max depth of cut: 4,7mm

Lead angle: 59°
Indexes per insert: 12
Diameter: 40–125mm

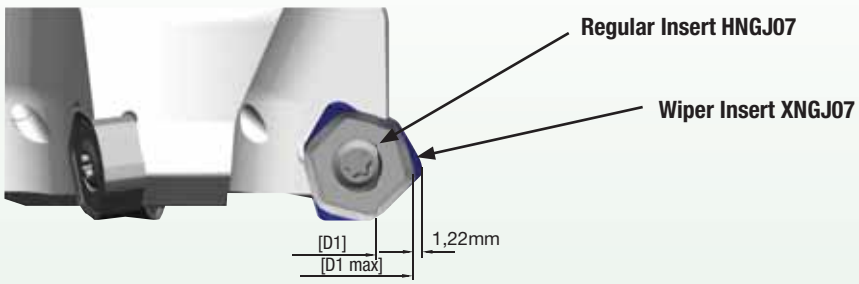
Pages: H20–H23





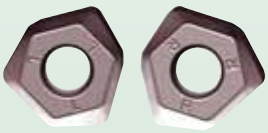
Easy-to-use wiper insert setup to achieve excellent surface floor finish

Wiper insert overlapping vs. regular insert



D1 max wiper = D1 max + 2,44mm

- Wiper inserts only applied with 45° lead angle cutter bodies.
- Easy to use. Regular and wiper inserts are loaded into fixed pockets. No adjustment required.
- Please have D1 max wiper in mind in case of limited working area.
- Use wiper inserts only in combination with periphery ground regular inserts HNGJ07.
- Up to cutting diameter D1=100mm load one wiper insert.
- For cutting diameter D1=125mm and above load two wiper inserts.
- Each wiper insert XNGJ07 can be applied with three right hand R and three left hand L cutting edges.



Victory™ M1200 Mini Series

Victory™ M1200 Mini HF High-Feed 15°

12 True Cutting Edges

15° Lead

Insert HNGJ0704
HNPJ0704

Ap1 max = 1,7mm

M1200 Mini HF can be loaded with all M1200 Mini standard inserts, except wiper inserts.

Victory™ M1200 Mini HF High-Feed

First choice for long reach face milling applications or light fixtures.

Chip thinning effect due to lead angle 15°. Tremendous enlargement of feed rate and MRR.

Up to 40% shorter machining cycle time.

Victory™ M1200 Mini 45°

12 True Cutting Edges

45° Lead

Insert HNGJ0704
HNPJ0704

Ap1 max = 3,5mm

Best-in-class leader in face milling up to Ap1 max = 3,5mm. Excellent choice for near net shape strategies and driven tools.

Victory™ M1200 Mini HD 59°

12 True Cutting Edges

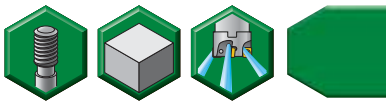
59° Lead

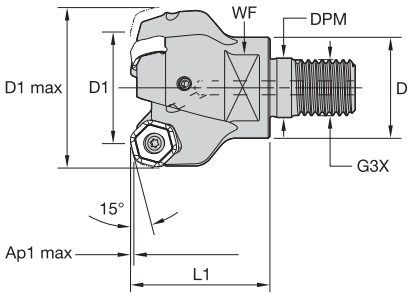
Insert HNGJ0704
HNPJ0704

Ap1 max = 4,7mm

Achieve a higher axial depth-of-cut capability up to Ap1 = 4,7mm with standard M1200 Mini inserts.

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- High-feed capability.





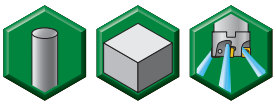
Screw-On End Mills

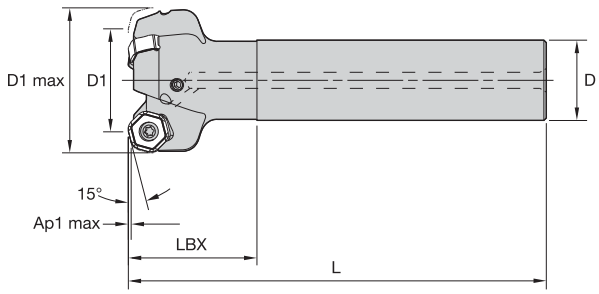
order number	catalogue number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	kg
4136874	**M1200HF025Z02M16HN07**	25	39	29	17,0	M16	32	22	1,7	2	20000	Yes	0,2
4136875	**M1200HF025Z03M16HN07**	25	39	29	17,0	M16	32	22	1,7	3	20000	Yes	0,2
4136876	**M1200HF032Z03M16HN07**	32	46	29	17,0	M16	40	22	1,7	3	17600	Yes	0,3
4136877	**M1200HF032Z04M16HN07**	32	46	29	17,0	M16	40	22	1,7	4	17600	Yes	0,3
4136878	**M1200HF040Z04M16HN07**	40	54	29	17,0	M16	40	22	1,7	4	15800	Yes	0,3
4136879	**M1200HF040Z05M16HN07**	40	54	29	17,0	M16	40	22	1,7	5	15800	Yes	0,3

Spare Parts

D1	 insert screw	 Nm	 Torx wrench
25	**12146034500**	3,5	**12148082400**
32	**12146034500**	3,5	**12148082400**
40	**12146034500**	3,5	**12148082400**

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- High-feed capability.





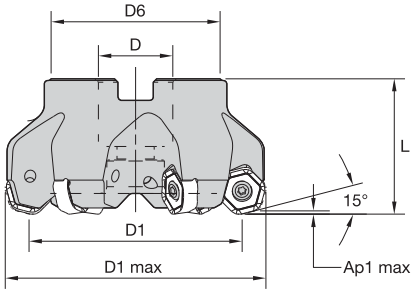
Cylindrical Shanks

order number	catalogue number	D1	D1 max	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4136880	**M1200HF025Z02A20HN07L120**	25	39,1	20	120	32	1,7	2	20000	Yes	0,33
4136881	**M1200HF025Z03A20HN07L120**	25	39,1	20	120	32	1,7	3	20000	Yes	0,31
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

Spare Parts

D1	 insert screw	 Nm	 Torx driver
25	**12146034500**	3,5	**12148082400**
32	**12146034500**	3,5	**12148082400**

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- High-feed capability.



Shell Mills

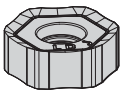
order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136884	**M1200HF040Z05HN07**	40	54,1	22	38	40	1,7	5	15800	Yes	0,29
4136885	**M1200HF050Z05HN07**	50	64,1	22	38	40	1,7	5	12700	Yes	0,40
4136886	**M1200HF063Z06HN07**	63	77,1	22	50	40	1,7	6	10100	Yes	0,67
4136887	**M1200HF080Z08HN07**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

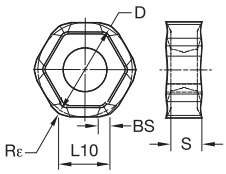
Spare Parts

D1	 insert screw	 Nm	 Torx driver	 socket-head cap screw
40	**12146034500**	3,5	**12148082400**	**12146120500**
50	**12146034500**	3,5	**12148082400**	**12146120500**
63	**12146034500**	3,5	**12148082400**	**12146120500**
80	**12146034500**	3,5	**12148082400**	**12748701000**

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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
H1	–	–	**–**	**–**	–	–


HNGJ-LDJ

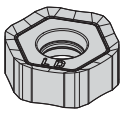


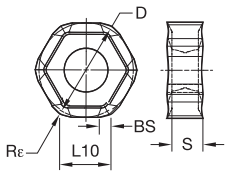
● first choice
○ alternate choice

P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0704ANFNLDJ	12	13	6,80	4,48	1,60	1,20	0,08	3954414	3954332


HNGJ-LD

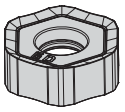


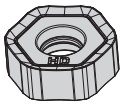
● first choice
○ alternate choice

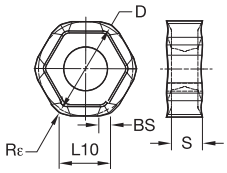
P			●	●	●		●	●		●
M			○	●	○		●	●	○	●
K	●	●	○	○	○	●	○			
N										
S				●			●	●	●	○
H							○			

HNGJ-LD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNGJ0704ANENLD	12	13	6,80	4,48	1,60	1,20	0,08	3954419	3954420	3954421	3954422	–	–	5895291	5895292	5528975	5550905
HNGJ070432ANENLD	12	13	6,80	4,48	–	3,20	0,08	3954428	–	3954429	3954430	–	–	–	–	–	–


HNPJ-GD


HNPJ-HD



● first choice
○ alternate choice

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

■ HNPJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNGD	12	13	6,80	4,45	1,27	1,20	0,10	3954432	3954473	-	3954474	3954475	5427374	5895293	5895294	5528976	5550906

■ HNPJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNHD	12	13	6,80	4,41	1,25	1,20	0,14	3954477	3954478	-	3954479	3954480	5427375	5895295	5895296	-	5550907
HNPJ070432ANSNHD	12	13	6,80	4,42	–	3,20	0,14	3954481	3954482	-	3954483	3954484	-	-	-	-	5895297

Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			TN7535			WK15CM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WP25PM			WP35CM			WS30PM			WP40PM			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	–	**–**	–	–	**–**	–
	6	200	**150**	120	190	**160**	130	–	**–**	–	180	**140**	110	–	**–**	–	–	**–**	–
M	1	245	**215**	200	245	**220**	185	270	**240**	220	235	**205**	185	–	**–**	–	–	**–**	–
	2	220	**190**	155	220	**190**	170	245	**215**	175	210	**180**	150	–	**–**	–	–	**–**	–
	3	170	**145**	115	175	**155**	140	185	**160**	125	155	**140**	110	–	**–**	–	–	**–**	–
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	–	**–**	–	55	**50**	35	50	**40**	35	–	**–**	–	–	**–**	–
	2	50	**40**	30	–	**–**	–	55	**50**	35	50	**40**	35	–	**–**	–	–	**–**	–
	3	60	**50**	30	–	**–**	–	65	**55**	35	60	**50**	35	–	**–**	–	–	**–**	–
	4	85	**60**	40	80	**60**	40	100	**70**	50	80	**60**	40	–	**–**	–	–	**–**	–
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.

Recommended Starting Feeds

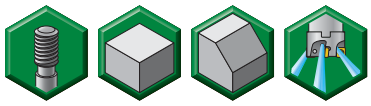
Recommended Starting Feeds [mm]

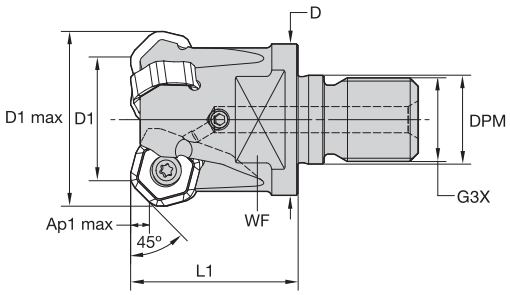
Light Machining	General Purpose	Heavy Machining

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.

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- Maximum number of teeth per diameter.





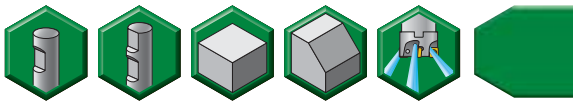
Screw-On End Mills

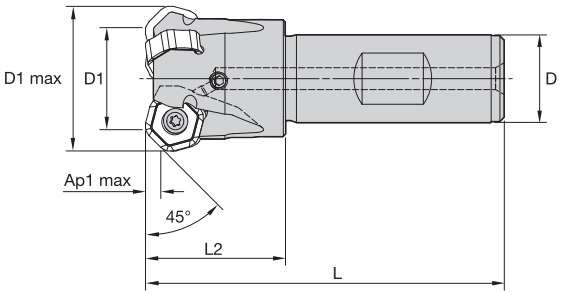
order number	catalogue number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	kg
3957839	**M1200D025Z02M16HN07**	25	33,7	29	17,0	M16	32	22	3,5	2	20000	Yes	0,13
3957840	**M1200D025Z03M16HN07**	25	33,7	29	17,0	M16	32	22	3,5	3	20000	Yes	0,13
3957841	**M1200D032Z03M16HN07**	32	40,7	29	17,0	M16	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
3957963	**M1200D040Z04M16HN07**	40	48,7	29	17,0	M16	40	22	3,5	4	15800	Yes	0,24
3957964	**M1200D040Z05M16HN07**	40	48,7	29	17,0	M16	40	22	3,5	5	15800	Yes	0,25

Spare Parts

D1	 insert screw	 Nm	 Torx driver
25	**12146034500**	3,5	**12148082400**
32	**12146034500**	3,5	**12148082400**
40	**12146034500**	3,5	**12148082400**

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- Maximum number of teeth per diameter.





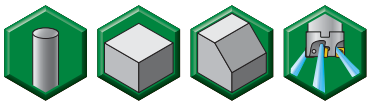
Weldon Shanks

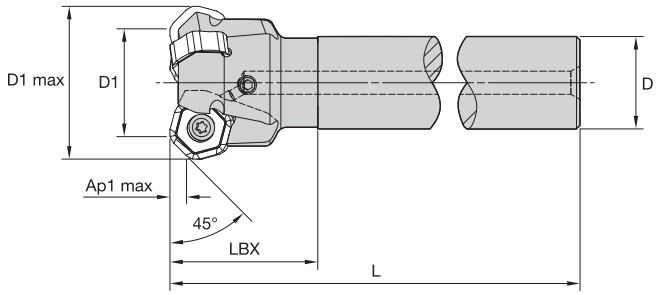
order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3958011	**M1200D025Z02B20HN07**	25	33,7	20	82	32	3,5	2	20000	Yes	0,22
3958012	**M1200D025Z03B20HN07**	25	33,7	20	82	32	3,5	3	20000	Yes	0,21
3958023	**M1200D032Z03B25HN07**	32	40,7	25	97	40	3,5	3	17600	Yes	0,39
3958024	**M1200D032Z04B25HN07**	32	40,7	25	97	40	3,5	4	17600	Yes	0,40

Spare Parts

D1	insert screw	Nm	Torx driver
25	**12146034500**	3,5	**12148082400**
32	**12146034500**	3,5	**12148082400**

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- Maximum number of teeth per diameter.





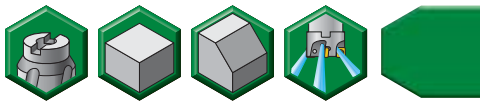
Cylindrical Shanks

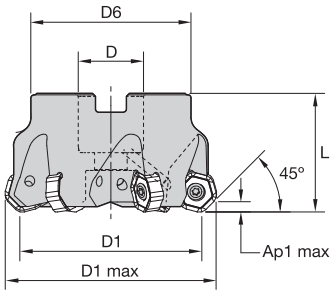
order number	catalogue number	D1	D1 max	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
3958025	**M1200D025Z02A20HN07L120**	25	33,7	20	120	32	3,5	2	20000	Yes	0,29
3958026	**M1200D025Z03A20HN07L120**	25	33,7	20	120	32	3,5	3	20000	Yes	0,28
3958029	**M1200D025Z02A25HN07L200**	25	33,7	25	200	32	3,5	2	20000	Yes	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

Spare Parts

D1	 insert screw	 Nm	 Torx driver
25	**12146034500**	3,5	**12148082400**
32	**12146034500**	3,5	**12148082400**

- Twelve cutting edges.
- First choice for low depth-of-cut face milling.
- Maximum number of teeth per diameter.





Shell Mills

order number	catalogue number	D1	D1 max	D	D6	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3957995	M1200D040Z04HN07	40	48,7	22	38	40	40	3,5	4	15800	Yes	0,26
3957996	M1200D040Z05HN07	40	48,7	22	38	40	40	3,5	5	15800	Yes	0,26
3957997	M1200D050Z04HN07	50	58,7	22	38	40	40	3,5	4	12700	Yes	0,35
3957998	M1200D050Z05HN07	50	58,7	22	38	40	40	3,5	5	12700	Yes	0,36
3957999	M1200D050Z06HN07	50	58,7	22	38	40	40	3,5	6	12700	Yes	0,35
3958000	M1200D063Z04HN07	63	71,7	22	50	40	40	3,5	4	10100	Yes	0,58
3958001	M1200D063Z06HN07	63	71,7	22	50	40	40	3,5	6	10100	Yes	0,65
3958002	M1200D063Z08HN07	63	71,7	22	50	40	40	3,5	8	10100	Yes	0,62
3958003	M1200D080Z05HN07	80	88,7	27	60	50	50	3,5	5	7900	Yes	1,11
3958004	M1200D080Z08HN07	80	88,7	27	60	50	50	3,5	8	7900	Yes	1,24
3958005	M1200D080Z10HN07	80	88,7	27	60	50	50	3,5	10	7900	Yes	1,17
3958006	M1200D100Z06HN07	100	108,7	32	80	50	50	3,5	6	6300	Yes	1,71
3958007	M1200D100Z09HN07	100	108,7	32	80	50	50	3,5	9	6300	Yes	1,82
3958008	M1200D100Z12HN07	100	108,7	32	80	50	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

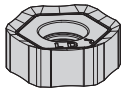
Spare Parts

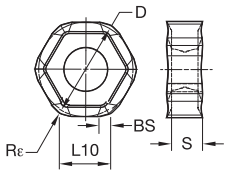
D1	insert screw	Nm	Torx driver	socket-head cap screw	mounting screw with coolant grooves	coolant screw assembly	coolant lock screw	coolant cap
40	12146034500	3,5	12148082400	–	12146109200	–	–	–
50	12146034500	3,5	12148082400	12146120500	–	–	–	–
63	12146034500	3,5	12148082400	12146120500	–	–	–	–
80	12146034500	3,5	12148082400	12748701000	–	–	–	–
100	12146034500	3,5	12148082400	–	–	12146109400	–	–
125	12146034500	3,5	12148082400	–	–	–	12146107000	12146111000

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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
H1	–	–	**–**	**–**	–	–


HNGJ-LDJ

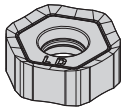


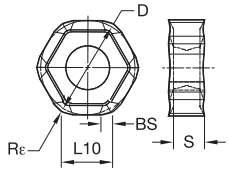
● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	
H	

HNGJ-LDJ

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0704ANFNLDJ	12	13	6,80	4,48	1,60	1,20	0,08	3954414	3954332


HNGJ-LD

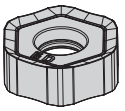


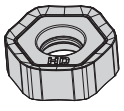
● first choice
○ alternate choice

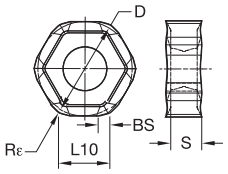
P				●	●	●		●	●		●
M				○	●	○		●	●	○	●
K	●	●	○	○	○	●	○				
N											
S					●			●	●	●	○
H								○			

HNGJ-LD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNGJ0704ANENLD	12	13	6,80	4,48	1,60	1,20	0,08	3954419	3954420	3954421	3954422	–	–	5895291	5895292	5528975	5550905
HNGJ070432ANENLD	12	13	6,80	4,48	–	3,20	0,08	3954428	–	3954429	3954430	–	–	–	–	–	–


HNPJ-GD


HNPJ-HD



● first choice
○ alternate choice

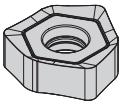
P			●	●	●		●	●		●
M			○	●	○		●	●	○	●
K	●	●	○	○	○	●	○			
N										
S				●			●	●	●	○
H							○			

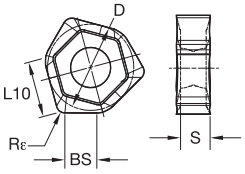
HNPJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNGD	12	13	6,80	4,45	1,27	1,20	0,10	3954432	3954473	-	3954474	3954475	5427374	5895293	5895294	5528976	5550906

HNPJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNHD	12	13	6,80	4,41	1,25	1,20	0,14	3954477	3954478	-	3954479	3954480	5427375	5895295	5895296	-	5550907
HNPJ070432ANSNHD	12	13	6,80	4,42	–	3,20	0,14	3954481	3954482	-	3954483	3954484	-	-	-	-	5895297


XNGJ-LDJ-3
Wiper



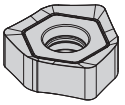
● first choice
○ alternate choice

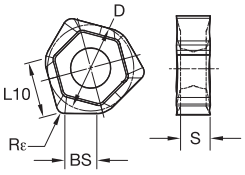
P		
M		
K		
N	●	●
S		
H		

XNGJ-LDJ-3 Wiper

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
XNGJ0704ANFNLDJ3W	3	13	6,78	4,47	6,78	1,30	0,08	3954416	3954433

NOTE: Inserts have 3 right-hand and 3 left-hand cutting edges.


XNGJ-LD3
Wiper



● first choice
○ alternate choice

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

XNGJ-LD3 Wiper

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
XNGJ0704ANENLD3W	3	13	6,78	4,47	6,78	1,30	0,08	3954424	3954425	3954426	3954427	-	5427373	5895298	-	-	5895299

NOTE: Inserts have 3 right-hand and 3 left-hand cutting edges.

Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			TN7535			WK15CM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WP25PM			WP35CM			WS30PM			WP40PM			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	–	**–**	–	–	**–**	–
	6	200	**150**	120	190	**160**	130	–	**–**	–	180	**140**	110	–	**–**	–	–	**–**	–
M	1	245	**215**	200	245	**220**	185	270	**240**	220	235	**205**	185	–	**–**	–	–	**–**	–
	2	220	**190**	155	220	**190**	170	245	**215**	175	210	**180**	150	–	**–**	–	–	**–**	–
	3	170	**145**	115	175	**155**	140	185	**160**	125	155	**140**	110	–	**–**	–	–	**–**	–
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	–	**–**	–	55	**50**	35	50	**40**	35	–	**–**	–	–	**–**	–
	2	50	**40**	30	–	**–**	–	55	**50**	35	50	**40**	35	–	**–**	–	–	**–**	–
	3	60	**50**	30	–	**–**	–	65	**55**	35	60	**50**	35	–	**–**	–	–	**–**	–
	4	85	**60**	40	80	**60**	40	100	**70**	50	80	**60**	40	–	**–**	–	–	**–**	–
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.

Recommended Starting Feeds

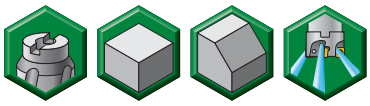
Recommended Starting Feeds [mm]

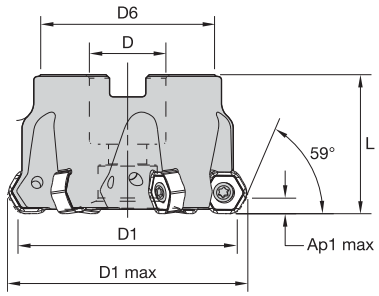
Light Machining	General Purpose	Heavy Machining

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	**0,32**	0,65	0,13	**0,23**	0,47	0,09	**0,17**	0,35	0,08	**0,15**	0,31	0,08	**0,14**	0,28	.F..LDJ
.E..LD	0,17	**0,50**	1,00	0,13	**0,36**	0,72	0,09	**0,27**	0,54	0,08	**0,23**	0,47	0,08	**0,21**	0,43	.E..LD
.S..GD	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..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

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

- Twelve cutting edges.
- Higher axial depth-of-cut capability with 59° lead angle.





Shell Mills

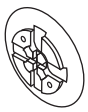
order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136482	**M1200HD040Z04HN07**	40	46,8	22	38	40	4,7	4	15800	Yes	0,22
4136863	**M1200HD040Z05HN07**	40	46,8	22	38	40	4,7	5	15800	Yes	0,22
4136864	**M1200HD050Z04HN07**	50	56,8	22	38	40	4,7	4	12700	Yes	0,34
4136865	**M1200HD050Z05HN07**	50	56,8	22	38	40	4,7	5	12700	Yes	0,34
4136866	**M1200HD063Z04HN07**	63	69,8	22	50	40	4,7	4	10100	Yes	0,58
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

Spare Parts







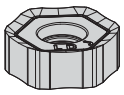


D1	insert screw	Nm	Torx driver	socket-head cap screw	mounting screw with coolant grooves	coolant screw assembly	coolant lock screw	coolant cap
40	**12146034500**	3,5	**12148082400**	–	**12146109200**	–	–	–
50	**12146034500**	3,5	**12148082400**	**12146120500**	–	–	–	–
63	**12146034500**	3,5	**12148082400**	**12146120500**	–	–	–	–
80	**12146034500**	3,5	**12148082400**	**12748701000**	–	–	–	–
100	**12146034500**	3,5	**12148082400**	–	–	**12146109400**	–	–
125	**12146034500**	3,5	**12148082400**	–	–	–	**12146107000**	**12146111000**

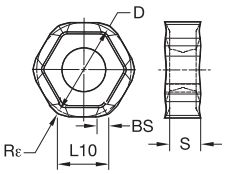
NOTE: Mounting screw with coolant groove, coolant screw assembly, coolant lock screw, and coolant cap must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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
H1	–	–	**–**	**–**	–	–



HNGJ-LDJ

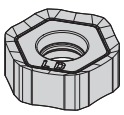


● first choice
○ alternate choice

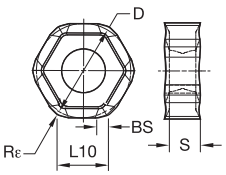
P	
M	
K	
N	● ●
S	
H	

HNGJ-LDJ

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0704ANFNLDJ	12	13	6,80	4,48	1,60	1,20	0,08	3954414	3954332



HNGJ-LD

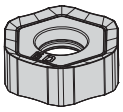


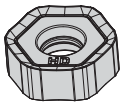
● first choice
○ alternate choice

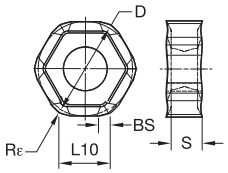
P			●	●	●		●	●		●
M			○	●	○		●	●	○	●
K	●	●	○	○	○	●	○			
N										
S				●			●	●	●	○
H							○			

HNGJ-LD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNGJ0704ANENLD	12	13	6,80	4,48	1,60	1,20	0,08	3954419	3954420	3954421	3954422	'	'	5895291	5895292	5528975	5550905
HNGJ070432ANENLD	12	13	6,80	4,48	–	3,20	0,08	3954428	'	3954429	3954430	'	'	'	'	'	'


HNPJ-GD


HNPJ-HD



● first choice
○ alternate choice

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

■ HNPJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNGD	12	13	6,80	4,45	1,27	1,20	0,10	3954432	3954473	-	3954474	3954475	5427374	5895293	5895294	5528976	5550906

■ HNPJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNHD	12	13	6,80	4,41	1,25	1,20	0,14	3954477	3954478	-	3954479	3954480	5427375	5895295	5895296	-	5550907
HNPJ070432ANSNHD	12	13	6,80	4,42	–	3,20	0,14	3954481	3954482	-	3954483	3954484	-	-	-	-	5895297

Recommended Starting Speeds

■ Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			TN7535			WK15CM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WP25PM			WP35CM			WS30PM			WP40PM			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	–	**–**	–	–	**–**	–
	6	200	**150**	120	190	**160**	130	–	**–**	–	180	**140**	110	–	**–**	–	–	**–**	–
M	1	245	**215**	200	245	**220**	185	270	**240**	220	235	**205**	185	–	**–**	–	–	**–**	–
	2	220	**190**	155	220	**190**	170	245	**215**	175	210	**180**	150	–	**–**	–	–	**–**	–
	3	170	**145**	115	175	**155**	140	185	**160**	125	155	**140**	110	–	**–**	–	–	**–**	–
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	–	**–**	–	55	**50**	35	50	**40**	35	–	**–**	–	–	**–**	–
	2	50	**40**	30	–	**–**	–	55	**50**	35	50	**40**	35	–	**–**	–	–	**–**	–
	3	60	**50**	30	–	**–**	–	65	**55**	35	60	**50**	35	–	**–**	–	–	**–**	–
	4	85	**60**	40	80	**60**	40	100	**70**	50	80	**60**	40	–	**–**	–	–	**–**	–
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.

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	0,14	**0,26**	0,53	0,10	**0,19**	0,38	0,08	**0,14**	0,29	0,07	**0,12**	0,25	0,06	**0,11**	0,23	.F..LDJ
.E..LD	0,14	**0,41**	0,82	0,10	**0,29**	0,59	0,08	**0,22**	0,44	0,07	**0,19**	0,38	0,06	**0,18**	0,35	.E..LD
.S..GD	0,27	**0,68**	1,10	0,20	**0,49**	0,79	0,15	**0,37**	0,59	0,13	**0,32**	0,51	0,12	**0,29**	0,47	.S..GD
.S..HD	0,27	**0,68**	1,10	0,20	**0,49**	0,79	0,15	**0,37**	0,59	0,13	**0,32**	0,51	0,12	**0,29**	0,47	.S..HD

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

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M1200

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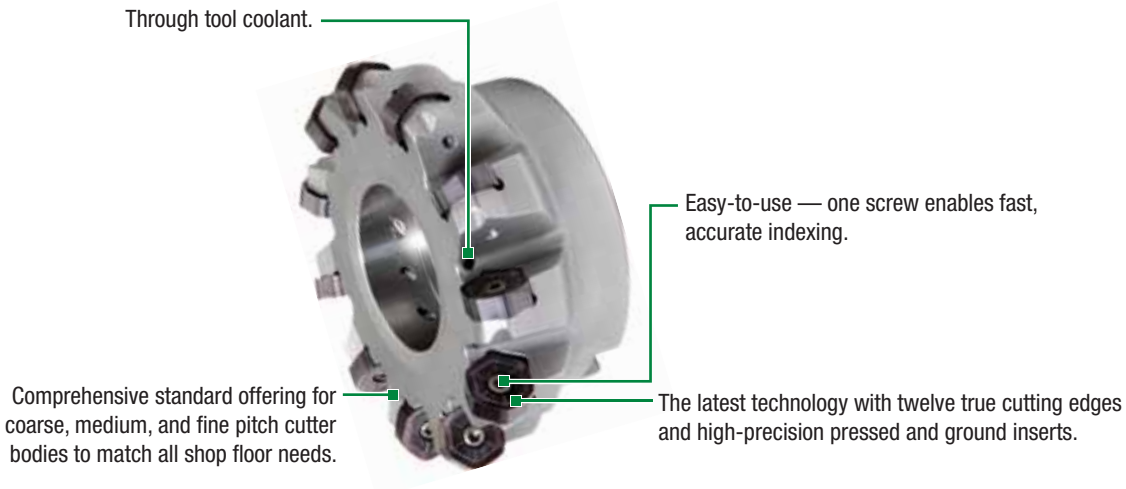
- Better tool life in light to heavy machining.

Best-in-class face milling platform to boost productivity on taper 50 spindle milling machines.



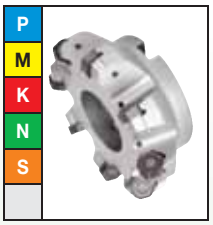
Face Mills

Victory™ M1200 HF 14.5°

Max depth of cut: 2,2mm

Lead angle: 14.5°
Indexes per insert: 12
Diameter: 50–160mm

Pages: H26–H29

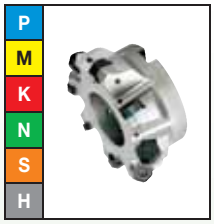


Victory™ M1200 45°

Max depth of cut: 4,5mm

Lead angle: 45°
Indexes per insert: 12
Diameter: 40–315mm

Pages: H30–H37

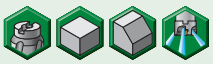


Victory™ M1200 HD 59°

Max depth of cut: 6mm

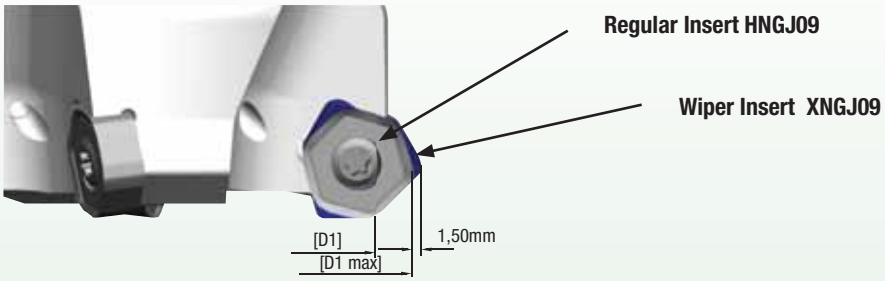
Lead angle: 59°
Indexes per insert: 12
Diameter: 50–160mm

Pages: H38–H41



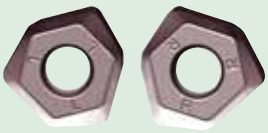
Easy-to-use wiper insert setup to achieve excellent surface floor finish

Wiper insert overlapping vs. regular insert

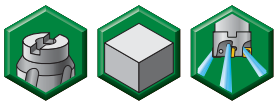


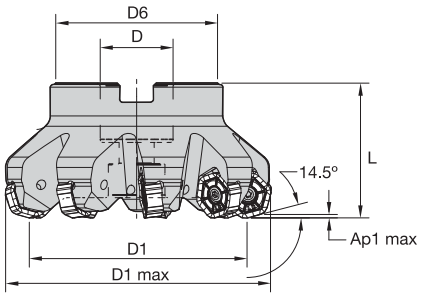
D1 max Wiper = D1 max + 3,00mm

- Wiper inserts only applied with 45° lead angle cutter bodies.
- Easy to use. Regular and wiper inserts are loaded into fixed pockets. No adjustment required.
- Please have D1 max wiper in mind in case of limited working area.
- Use wiper inserts only in combination with periphery ground regular inserts HNGJ09.
- Up to cutting diameter D1=100mm load one wiper insert.
- For cutting diameter D1=125mm and above load two wiper inserts.
- Each wiper insert XNGJ09 can be applied with three right hand R and three left hand L cutting edges.



- Twelve cutting edges.
- High feed rates for rough face milling.
- Use standard M1200 inserts.
- Do not load wiper inserts.





Shell Mills

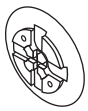
order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3750370	**M1200HF050Z04HN09**	50	67,9	22	38	40	2,2	4	11400	Yes	0,65
3750372	**M1200HF063Z05HN09**	63	80,9	22	50	40	2,2	5	8950	Yes	0,65
3750434	**M1200HF080Z06HN09**	80	97,9	27	60	50	2,2	6	7300	Yes	1,24
3750435	**M1200HF100Z08HN09**	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
3957969	**M1200HF160Z12HN09**	160	177,9	40	110	63	2,2	12	3900	Yes	5,14

Spare Parts







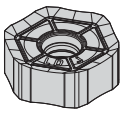



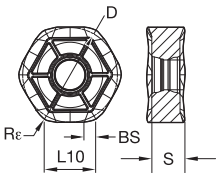
D1	insert screw	Nm	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw assembly	coolant lock screw	coolant cap
50	**12146034500**	3,5	**12148082400**	**12146120500**	**12146101000**	–	–	–
63	**12146034500**	3,5	**12148082400**	**12146120500**	**12146101000**	–	–	–
80	**12146034500**	3,5	**12148082400**	**12748701000**	**12146101800**	–	–	–
100	**12146034500**	3,5	**12148082400**	–	–	**12146109400**	–	–
125	**12146034500**	3,5	**12148082400**	–	–	–	**12146107000**	**12146111000**
160	**12146034500**	3,5	**12148082400**	–	–	–	**12146107000**	**12146111100**

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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
H1	–	–	**–**	**–**	–	–


HNGJ-LDJ

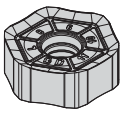


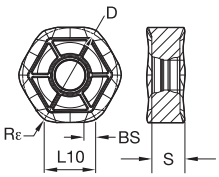
● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	
H	

HNGJ-LDJ

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0905ANFNLDJ	12	16	8,58	5,56	1,80	1,20	0,02	3865373	3606383


HNPJ-GD

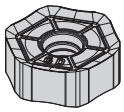


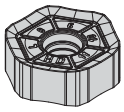
● first choice
○ alternate choice

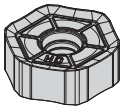
P		●	●	●		●		●	●
M		○	●	○		●	○	●	●
K	●	○	○	○	●	○			
N									
S			●			●	●	●	○
H						○			

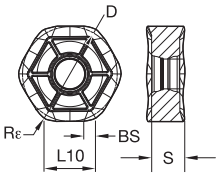
HNPJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNPJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3761185	–	3761187	3761188	5427372	5895374	–	5895375	5550908


HNGJ-GD


HNPJ-HD


HNGJ-HD



● first choice
○ alternate choice

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

■ HNGJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3119541	3614650	3037596	3093721	5427370	–	5528974	5895349	5895350

■ HNPJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNPJ090543ANSNHD	12	16	8,50	5,44	–	4,34	0,13	3670866	–	3670865	–	–	5895378	–	5895379	5895380
HNPJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,18	3670864	–	3670842	–	5427371	5895376	–	5895377	5550909

■ HNGJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ090543ANSNHD	12	16	8,50	5,44	–	4,35	0,20	3564083	3564084	3564085	–	–	–	–	–	–
HNGJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,17	3563900	3563901	3563902	–	–	5895371	–	5895372	5895373

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			TN7535			WK15CM			WP25PM		
P	1	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	–	–	–	395	**340**	325
	2	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	–	–	–	330	**290**	240
	3	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	–	–	–	305	**260**	210
	4	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	–	–	–	270	**220**	180
	5	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	–	–	–	220	**205**	180
	6	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	–	–	–	200	**150**	120
M	1	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	–	–	–	245	**215**	200
	2	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	–	–	–	220	**190**	155
	3	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	–	–	–	170	**145**	115
K	1	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410	275	**245**	220
	2	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330	215	**190**	180
	3	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	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		WS30PM			WP35CM			WP40PM			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	–	–	–	–	–	–
	6	–	–	–	190	**160**	130	180	**140**	110	–	–	–	–	–	–
M	1	270	**240**	220	245	**220**	185	235	**205**	185	–	–	–	–	–	–
	2	245	**215**	175	220	**190**	170	210	**180**	150	–	–	–	–	–	–
	3	185	**160**	125	175	**155**	140	155	**140**	110	–	–	–	–	–	–
K	1	–	–	–	355	**320**	290	–	–	–	–	–	–	–	–	–
	2	–	–	–	280	**250**	230	–	–	–	–	–	–	–	–	–
	3	–	–	–	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	55	**50**	35	–	–	–	50	**40**	35	–	–	–	–	–	–
	2	55	**50**	35	–	–	–	50	**40**	35	–	–	–	–	–	–
	3	65	**55**	35	–	–	–	60	**50**	35	–	–	–	–	–	–
	4	100	**70**	50	80	**60**	40	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.

Recommended Starting Feeds

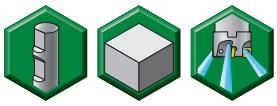
Recommended Starting Feeds [mm]

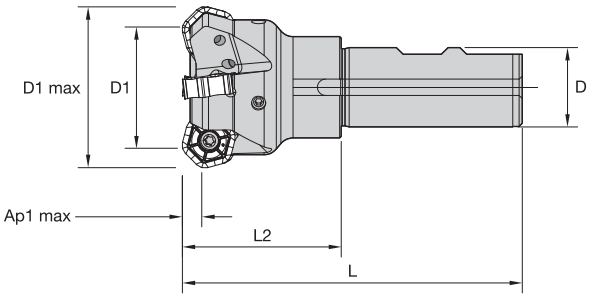
Light Machining	General Purpose	Heavy Machining

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	0,45	**0,90**	1,84	0,33	**0,65**	1,31	0,25	**0,48**	0,97	0,21	**0,42**	0,84	0,20	**0,39**	0,77	.F..LDJ
.E..LD	0,45	**1,36**	2,81	0,33	**0,98**	1,97	0,25	**0,73**	1,46	0,21	**0,63**	1,27	0,20	**0,58**	1,16	.E..LD
.S..GD	0,72	**2,35**	3,89	0,52	**1,67**	2,70	0,39	**1,23**	1,98	0,34	**1,07**	1,72	0,31	**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.

- Twelve cutting edges.
- First choice for general face milling.
- Low cutting forces for maximum productivity.





Weldon Shanks

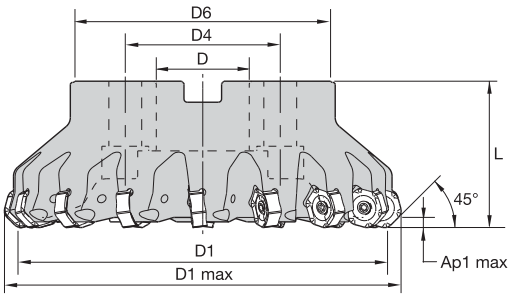
order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3325311	**M1200D040Z04B25HN09**	40	51,0	25	107	50	4,5	4	15800	Yes	0,52
3325310	**M1200D040Z03B25HN09**	40	51,0	25	107	50	4,5	3	15800	Yes	0,53

Spare Parts



D1	insert screw	Nm	Torx driver
40	**12146034500**	3,5	**12148082400**

- Twelve cutting edges.
- First choice for general face milling.
- Low cutting forces for maximum productivity.



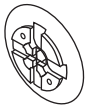
Shell Mills

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

(continued)

(Shell Mills — continued)

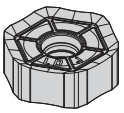
Spare Parts

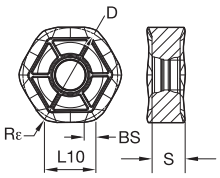
D1	 insert screw	Nm	 Torx driver	 socket-head cap screw	 socket-head cap screw with coolant groove	 coolant screw assembly	 coolant lock screw	 coolant cap
40	**12146034500**	3,5	**12148082400**	–	**12146109200**	–	–	–
50	**12146034500**	3,5	**12148082400**	–	–	–	–	–
63	**12146034500**	3,5	**12148082400**	–	–	–	–	–
80	**12146034500**	3,5	**12148082400**	**12748701000**	–	–	–	–
100	**12146034500**	3,5	**12148082400**	–	–	**12146109400**	–	–
125	**12146034500**	3,5	**12148082400**	–	–	–	**12146107000**	**12146111000**
160	**12146034500**	3,5	**12148082400**	–	–	–	**12146107000**	**12146111100**
200	**12146034500**	3,5	**12148082400**	–	–	–	–	**12146111200**
250	**12146034500**	3,5	**12148082400**	–	–	–	–	**12146111300**
315	**12146034500**	3,5	**12148082400**	–	–	–	–	**12146111400**

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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
H1	–	–	**–**	**–**	–	–


HNGJ-LDJ

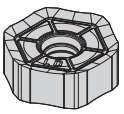


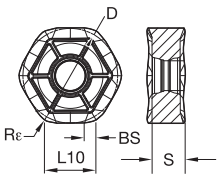
● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	
H	

HNGJ-LDJ

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0905ANFNLDJ	12	16	8,58	5,56	1,80	1,20	0,02	3865373	3606383


HNGJ-LD

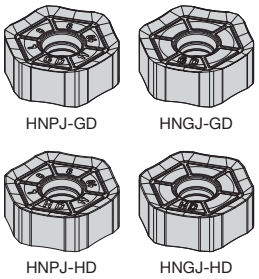


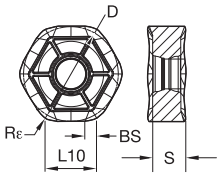
● first choice
○ alternate choice

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

HNGJ-LD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ0905ANENLD	12	16	8,58	5,56	1,80	1,20	0,05	3093559	3330950	3030034	3030017	I	5895346	5528973	5895347	5895348





● first choice
○ alternate choice

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

■ HNPJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNPJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3761185	I	3761187	3761188	5427372	5895374	I	5895375	5550908

■ HNGJ-GD

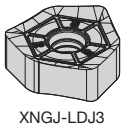
catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3119541	3614650	3037596	3093721	5427370	I	5528974	5895349	5895350

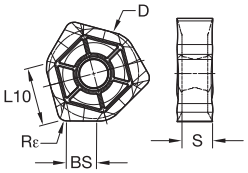
■ HNPJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNPJ090543ANSNHD	12	16	8,50	5,44	–	4,34	0,13	3670866	I	3670865	I	I	5895378	I	5895379	5895380
HNPJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,18	3670864	I	3670842	I	5427371	5895376	I	5895377	5550909

■ HNGJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ090543ANSNHD	12	16	8,50	5,44	–	4,35	0,20	3564083	3564084	3564085	I	I	I	I	I	I
HNGJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,17	3563900	3563901	3563902	I	I	5895371	I	5895372	5895373


XNGJ-LDJ3
Wiper



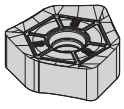
● first choice
○ alternate choice

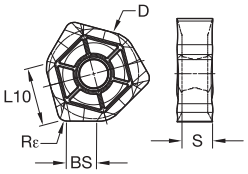
P	
M	
K	
N	● ●
S	
H	

XNGJ-LDJ3 Wiper

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
XNGJ0905ANFNLDJ3W	3	16	9,60	5,51	6,00	1,60	0,02	3865375	3865358

NOTE: Inserts have 3 right-hand and 3 left-hand cutting edges.


XNGJ-GD3
Wiper



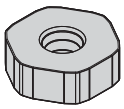
● first choice
○ alternate choice

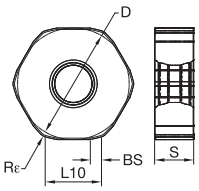
P		●	●	●		●		●	●
M		○	●	○		●	○	●	●
K	●	○	○	○	●	○			
N									
S			●			●	●	●	○
H						○			

XNGJ-GD3 Wiper

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
XNGJ0905ANSNGD3W	3	16	9,60	5,51	6,00	1,60	0,09	3524707	3523620	3066479	I	5622622	5895381	I	I	5895382

NOTE: Inserts have 3 right-hand and 3 left-hand cutting edges.


HNEC535ANSN
Ceramic



● first choice
○ alternate choice

P	
M	
K	●
N	
S	
H	

HNEC535ANSN Ceramic

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK25YM
HNEC0905ANSN	12	16	9,17	5,56	1,95	1,20	0,19	5910033

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			TN7535			WK15CM			WP25PM		
P	1	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	–	–	–	395	**340**	325
	2	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	–	–	–	330	**290**	240
	3	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	–	–	–	305	**260**	210
	4	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	–	–	–	270	**220**	180
	5	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	–	–	–	220	**205**	180
	6	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	–	–	–	200	**150**	120
M	1	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	–	–	–	245	**215**	200
	2	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	–	–	–	220	**190**	155
	3	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	–	–	–	170	**145**	115
K	1	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410	275	**245**	220
	2	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330	215	**190**	180
	3	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WS30PM			WP35CM			WP40PM			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	–	–	–	–	–	–	–	–	–
	6	–	–	–	190	**160**	130	180	**140**	110	–	–	–	–	–	–	–	–	–
M	1	270	**240**	220	245	**220**	185	235	**205**	185	–	–	–	–	–	–	–	–	–
	2	245	**215**	175	220	**190**	170	210	**180**	150	–	–	–	–	–	–	–	–	–
	3	185	**160**	125	175	**155**	140	155	**140**	110	–	–	–	–	–	–	–	–	–
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	55	**50**	35	–	–	–	50	**40**	35	–	–	–	–	–	–	–	–	–
	2	55	**50**	35	–	–	–	50	**40**	35	–	–	–	–	–	–	–	–	–
	3	65	**55**	35	–	–	–	60	**50**	35	–	–	–	–	–	–	–	–	–
	4	100	**70**	50	80	**60**	40	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.

Recommended Starting Feeds

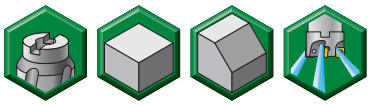
Recommended Starting Feeds [mm]

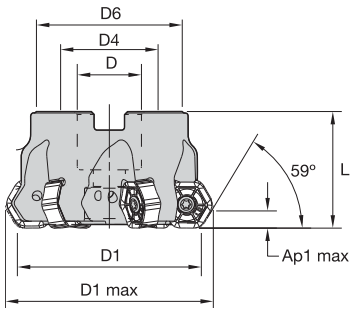
Light Machining	General Purpose	Heavy Machining

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.

- Twelve cutting edges.
- Higher Ap1 max with standard insert.

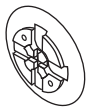




Shell Mills

order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4152113	**M1200HD050Z04HN09**	50	58,6	22	–	38	40	6,0	4	12700	Yes	0,29
4152114	**M1200HD050Z05HN09**	50	58,6	22	–	38	40	6,0	5	12700	Yes	0,28
4152115	**M1200HD063Z04HN09**	63	71,5	22	–	50	40	6,0	4	10100	Yes	0,54
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
4152122	**M1200HD125Z10HN09**	125	133,5	40	–	90	63	6,0	10	5050	Yes	2,85
4152123	**M1200HD160Z09HN09**	160	168,5	40	66,7	110	63	6,0	9	3900	Yes	4,62
4152124	**M1200HD160Z12HN09**	160	168,5	40	66,7	110	63	6,0	12	3900	Yes	4,75

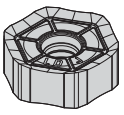
Spare Parts

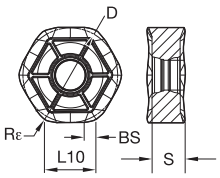
D1	 insert screw	 Nm	 Torx driver	 socket-head cap screw	 coolant screw assembly	 coolant lock screw	 coolant cap
50	**12146034500**	3,5	**12148082400**	**12146120500**	–	–	–
63	**12146034500**	3,5	**12148082400**	**12146120500**	–	–	–
80	**12146034500**	3,5	**12148082400**	**12748701000**	–	–	–
100	**12146034500**	3,5	**12148082400**	–	**12146109400**	–	–
125	**12146034500**	3,5	**12148082400**	–	–	**12146107000**	**12146111000**
160	**12146034500**	3,5	**12148082400**	–	–	**12146107000**	**12146111100**

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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
H1	–	–	**–**	**–**	–	–


HNGJ-LDJ

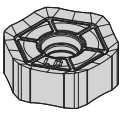


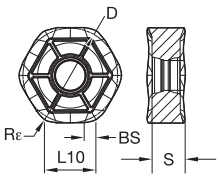
● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	
H	

HNGJ-LDJ

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0905ANFNLDJ	12	16	8,58	5,56	1,80	1,20	0,02	3865373	3606383


HNGJ-LD

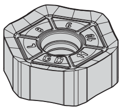


● first choice
○ alternate choice

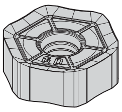
P		●	●	●	●			●	●	
M		○	●	○	●		○	●	●	
K	●	○	○	○	○	●				
N										
S			●		●		●	●	○	
H					○					

HNGJ-LD

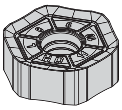
catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNGJ0905ANENLD	12	16	8,58	5,56	1,80	1,20	0,05	3093559	3330950	3030034	3030017	5895346	I	5528973	5895347	5895348



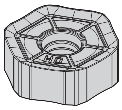
HNPJ-GD



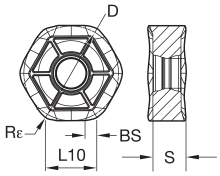
HNGJ-GD



HNPJ-HD



HNGJ-HD



● first choice
○ alternate choice

	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
P		●	●	●	●			●	●
M		○	●	○	●		○	●	●
K	●	○	○	○	○	●			
N									
S			●		●		●	●	○
H					○				

■ HNPJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNPJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3761185	–	3761187	3761188	5895374	5427372	–	5895375	5550908

■ HNGJ-GD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNGJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	3119541	3614650	3037596	3093721	–	5427370	5528974	5895349	5895350

■ HNPJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNPJ090543ANSNHD	12	16	8,50	5,44	–	4,34	0,13	3670866	–	3670865	–	5895378	–	–	5895379	5895380
HNPJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,18	3670864	–	3670842	–	5895376	5427371	–	5895377	5550909

■ HNGJ-HD

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNGJ090543ANSNHD	12	16	8,50	5,44	–	4,35	0,20	3564083	3564084	3564085	–	–	–	–	–	–
HNGJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,17	3563900	3563901	3563902	–	5895371	–	–	5895372	5895373

Recommended Starting Speeds [m/min]

Material Group		TN6501			TN6520			TN6525			TN6540			TN7535			WP25PM		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	1295	**1120**	1060
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	1080	**940**	785
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	1000	**845**	690
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	890	**725**	590
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	725	**670**	590
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	650	**490**	395
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	805	**710**	650
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	725	**630**	510
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	550	**475**	370
K	1	–	–	–	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	905	**805**	725
	2	–	–	–	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	710	**630**	590
	3	–	–	–	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	590	**535**	475
N	1	2400	**1440**	1200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	1640	**980**	800	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	960	**600**	480	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	50	**35**	30	–	–	–	155	**140**	95
	2	–	–	–	–	–	–	–	–	–	25	**20**	10	–	–	–	155	**140**	95
	3	–	–	–	–	–	–	–	–	–	70	**40**	30	–	–	–	200	**155**	95
	4	–	–	–	–	–	–	–	–	–	60	**30**	25	–	–	–	275	**200**	140
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	475	**355**	275
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WK15CM			WS30PM			WP35CM			WP40PM			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	–	–	–	–	–	–
	6	–	–	–	–	–	–	190	**160**	130	180	**140**	110	–	–	–	–	–	–
M	1	–	–	–	270	**240**	220	245	**220**	185	235	**205**	185	–	–	–	–	–	–
	2	–	–	–	245	**215**	175	220	**190**	170	210	**180**	150	–	–	–	–	–	–
	3	–	–	–	185	**160**	125	175	**155**	140	155	**140**	110	–	–	–	–	–	–
K	1	505	**460**	410	–	–	–	355	**320**	290	–	–	–	–	–	–	–	–	–
	2	400	**355**	330	–	–	–	280	**250**	230	–	–	–	–	–	–	–	–	–
	3	335	**300**	275	–	–	–	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	–	–	–	55	**50**	35	–	–	–	50	**40**	35	–	–	–	–	–	–
	2	–	–	–	55	**50**	35	–	–	–	50	**40**	35	–	–	–	–	–	–
	3	–	–	–	65	**55**	35	–	–	–	60	**50**	35	–	–	–	–	–	–
	4	–	–	–	100	**70**	50	80	**60**	40	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.

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	0,13	**0,27**	0,54	0,10	**0,19**	0,39	0,07	**0,14**	0,29	0,06	**0,13**	0,25	0,06	**0,12**	0,23		.F..LDJ
.E..LD	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		.E..LD
.S..GD	0,21	**0,68**	1,10	0,15	**0,49**	0,79	0,12	**0,37**	0,59	0,10	**0,32**	0,51	0,09	**0,29**	0,47		.S..GD
.S..HD	0,27	**0,68**	1,10	0,20	**0,49**	0,79	0,15	**0,37**	0,59	0,13	**0,32**	0,51	0,12	**0,29**	0,47		.S..HD

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

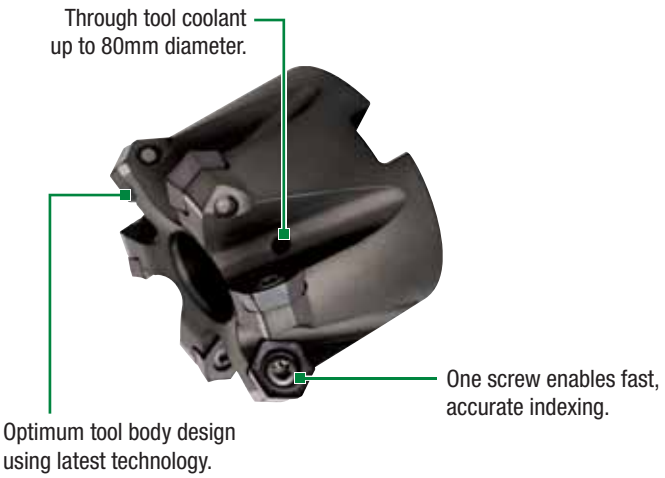
When Low Cutting Forces Are Required •
M640 Series

M640

The M640 platform is the first choice when high productivity, superior finish operations, and soft cutting performance are a priority. With six effective cutting edges and a streamlined body design, this easy-to-use tool is ideal, even for low-power machines.

- Highly positive rake angle means extremely low cutting forces.
- Available in geometries and grades for all applications.
- Easy-to-use for fast, accurate indexing.

All pockets are machined into preheated material for excellent runout and pocket strength.



Face Mills

M640

Max depth of cut: 4,8mm

Lead angle: 58°
Indexes per insert: 6
Diameter: 32–125mm

Pages: H44–H49

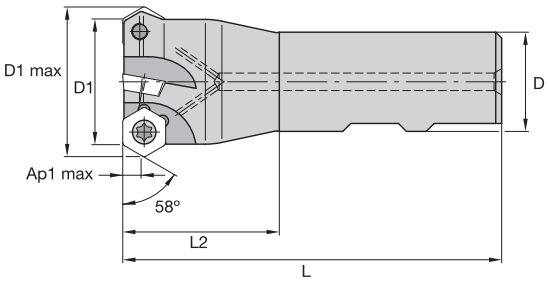
Insert Offering

Low cutting force wiper inserts: Special wiper design for very soft cutting in finishing operations with high productivity.

Six effective cutting edges.

Highly positive rake:
- Extremely low cutting forces.
- For low-power machines, driven units, and light fixtures.
- Chipbreaker and grades for all applications.
- Through tool coolant up to 80mm diameter.

- Six cutting edges.
- Highly positive rake for low-power machines or light fixtures.
- Geometries and grades for all applications.



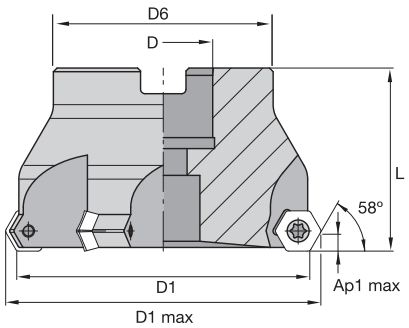
Weldon Shanks

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

Spare Parts

D1	insert screw	Nm	Torx driver
32	**12148038800**	4,0	**12148000600**

- Six cutting edges.
- Highly positive rake for low-power machines or light fixtures.
- Geometries and grades for all applications.



Shell Mills

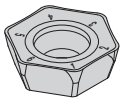
order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2263132	**12395410200**	50	56,4	22	47	40	4,8	4	19000	Yes	0,40
2263154	**12395410400**	63	69,4	22	50	40	4,8	5	15000	Yes	0,55
2263156	**12395410600**	80	86,4	27	60	50	4,8	6	11500	Yes	1,05
2263158	**12395410800**	100	106,4	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

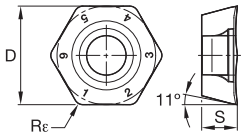
Spare Parts

D1	 insert screw	 Nm	 Torx driver
50	**12148038800**	4,0	**12148000600**
63	**12148038800**	4,0	**12148000600**
80	**12148038800**	4,0	**12148000600**
100	**12148038800**	4,0	**12148000600**
125	**12148038800**	4,0	**12148000600**

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	.E..LD	WP40PM	**.E..GD**	**WP40PM**	.E..GD	WP40PM
P3–P4	.E..LD	WP25PM	**.E..GD**	**WP35CM**	.E..GD	WP35CM
P5–P6	.E..LD	WP25PM	**.E..GD**	**WP35CM**	.E..GD	WP35CM
M1–M2	.E..LD	WP25PM	**.E..GD**	**WP25PM**	.E..GD	WP25PM
M3	.E..LD	WP40PM	**.E..GD**	**WP35CM**	.E..GD	WP35CM
K1–K2	.E..LD	TN6510	**.E..GD**	**WK15CM**	.E..GD	WK15CM
K3	.E..LD	TN6520	**.E..GD**	**WP35CM**	.E..GD	WP35CM
N1–N2	.F..LDAL	TN6501	**.F..LDAL**	**TN6501**	.F..LDAL	TN6501
N3	.F..LDAL	TN6501	**.F..LDAL**	**TN6501**	.F..LDAL	TN6501
S1–S2	.E..LD	WP25PM	**.E..GD**	**WP25PM**	.E..GD	WP25PM
S3	.E..GD	WS30PM	**.E..GD**	**WS30PM**	.E..GD	WP40PM
S4	.E..GD	WS30PM	**.E..GD**	**WS30PM**	.E..GD	WP40PM
H1	.E..LD	TN2510	**.E..GD**	**TN2510**	–	–


HPGT-LDAL



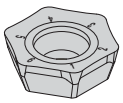
● first choice
○ alternate choice

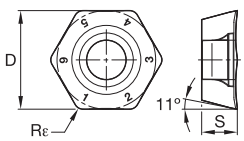
	TN6501	THM-U	THM
P			
M			
K			○
N	●	●	●
S			○
H			

HPGT-LDAL

catalogue number	cutting edges	D	S	Rε	hm	2957548	2288107	2288106
HPGT06T3DZFRLDAL	6	11	4,00	0,90	0,08	TN6501	THM-U	THM

NOTE: Ap1 max = 3,2mm with this geometry.


HPGT-LD



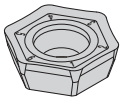
● first choice
○ alternate choice

	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
P	○			●	●	●	●		●		●	●
M				○	●	○	○		●	○	●	●
K	●	●	●	○	○		○	●	○			
N												
S					●				●	●	●	○
H	●								○			

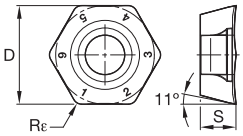
HPGT-LD

catalogue number	cutting edges	D	S	Rε	hm	2288072	I	2957585	2957547	2957587	2288070	I	I	5895784	I	I	5895785
HPGT06T3DZERLD	6	11	3,99	0,98	0,08	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM

NOTE: Ap1 max = 3mm with this geometry.



HPPT-GD
HPGT-GD



● first choice
○ alternate choice

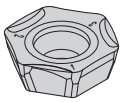
		TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
P		○			●	●	●	●		●		●	●
M					○	●	○	○		●	○	●	●
K		●	●	●	○	○		○	●	○			
N													
S						●				●	●	●	○
H		●								○			

■ HPPT-GD

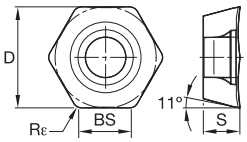
catalogue number	cutting edges	D	S	Rε	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HPPT06T3DZENGD	6	11	3,97	0,98	0,10	I	I	2957583	2957586	2957552	2271760	2271759	I	5895788	I	5895790	5895789

■ HPGT-GD

catalogue number	cutting edges	D	S	Rε	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HPGT06T3DZENGD	6	11	3,97	0,98	0,10	2288069	2957589	I	2957588	2957546	2288067	2288066	5427387	5895782	5528978	I	5895783



HPGT-GD
Wiper



● first choice
○ alternate choice

		TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
P		○			●	●	●	●		●		●	●
M					○	●	○	○		●	○	●	●
K		●	●	●	○	○		○	●	○			
N													
S						●				●	●	●	○
H		●								○			

■ HPGT-GD Wiper

catalogue number	cutting edges	D	S	BS	Rε	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HPGT06T3DZERGD3W	3	11	4,00	2,88	0,98	0,10	I	2957549	I	2957584	I	2288103	I	5427388	5895786	I	I	5895787

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6510			TN6520			TN6525			TN6540			TN7525		
P	1	660	**580**	540	–	**–**	–	–	**–**	–	410	**320**	280	360	**280**	240	410	**310**	280
	2	410	**370**	330	–	**–**	–	–	**–**	–	320	**250**	215	250	**190**	170	310	**250**	215
	3	370	**330**	305	–	**–**	–	–	**–**	–	280	**215**	185	215	**170**	140	280	**215**	185
	4	275	**260**	230	–	**–**	–	–	**–**	–	235	**170**	145	180	**130**	110	235	**170**	145
	5	330	**300**	275	–	**–**	–	–	**–**	–	310	**235**	200	240	**180**	150	310	**235**	200
	6	230	**205**	175	–	**–**	–	–	**–**	–	205	**160**	130	160	**120**	100	205	**160**	130
M	1	270	**240**	210	–	**–**	–	–	**–**	–	190	**120**	80	130	**80**	60	245	**220**	185
	2	245	**210**	190	–	**–**	–	–	**–**	–	120	**80**	50	80	**50**	40	220	**190**	170
	3	190	**175**	150	–	**–**	–	–	**–**	–	125	**80**	55	85	**50**	40	175	**155**	140
K	1	420	**360**	300	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	380	**280**	240
	2	360	**300**	250	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	325	**240**	200
	3	300	**250**	200	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	240	**200**	170
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		TN7535			WK15CM			WP25PM			WS30PM			WP35CM			WP40PM		
P	1	545	**475**	445	–	**–**	–	395	**340**	325	–	**–**	–	545	**475**	445	355	**310**	295
	2	335	**305**	275	–	**–**	–	330	**290**	240	–	**–**	–	335	**305**	275	300	**260**	215
	3	305	**275**	245	–	**–**	–	305	**260**	210	–	**–**	–	305	**275**	245	275	**235**	190
	4	230	**210**	190	–	**–**	–	270	**220**	180	–	**–**	–	230	**210**	190	245	**205**	160
	5	310	**275**	250	–	**–**	–	220	**205**	180	–	**–**	–	310	**275**	250	205	**185**	160
	6	190	**160**	130	–	**–**	–	200	**150**	120	–	**–**	–	190	**160**	130	180	**140**	110
M	1	245	**220**	185	–	**–**	–	245	**215**	200	270	**240**	220	245	**220**	185	235	**205**	185
	2	220	**190**	170	–	**–**	–	220	**190**	155	245	**215**	175	220	**190**	170	210	**180**	150
	3	175	**155**	140	–	**–**	–	170	**145**	115	185	**160**	125	175	**155**	140	155	**140**	110
K	1	355	**320**	290	505	**460**	410	275	**245**	220	–	**–**	–	355	**320**	290	–	**–**	–
	2	280	**250**	230	400	**355**	330	215	**190**	180	–	**–**	–	280	**250**	230	–	**–**	–
	3	235	**210**	190	335	**300**	275	180	**160**	145	–	**–**	–	235	**210**	190	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**40**	30	55	**50**	35	–	**–**	–	50	**40**	35
	2	–	**–**	–	–	**–**	–	50	**40**	30	55	**50**	35	–	**–**	–	50	**40**	35
	3	–	**–**	–	–	**–**	–	60	**50**	30	65	**55**	35	–	**–**	–	60	**50**	35
	4	–	**–**	–	–	**–**	–	85	**60**	40	100	**70**	50	80	**60**	40	80	**60**	40
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		TN6501			THM-U			THM		
P	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
K	1	–	–	–	230	**205**	180	145	**110**	90
	2	–	–	–	–	–	–	150	**120**	85
	3	–	–	–	–	–	–	155	**115**	70
N	1	2400	**1440**	1200	2400	**1440**	1200	1080	**720**	600
	2	1640	**980**	800	1640	**980**	800	820	**560**	460
	3	960	**600**	480	960	**600**	480	540	**335**	240
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.

Recommended Starting Feeds

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.

The Ideal Heavy-Duty Face Milling Platform •
M660 Series

M660

The M660 Series heavy-duty face milling platform, with its strong tool body design and perfect axial and radial runout, is the ultimate high-performance booster in the heavy machining of steel and cast iron.

- Three tailor-made chipbreakers with large chip gash ensures excellent chip evacuation.
- Easy, safe, and stable clamping ensures accurate indexing.
- Thick inserts for reliability and high MRR capability.

Face Mills

M660 SN1205..

Max depth of cut: 6,4mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 20–160mm

Pages: H52–H57

M660 SN1505..

Max depth of cut: 8,4mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 100mm

Pages: H58–H60

Insert Offering

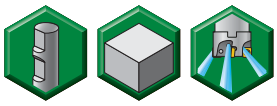
Three tailor-made chipbreakers (-20, -21, -31) for all heavy-duty applications in steel and cast iron.

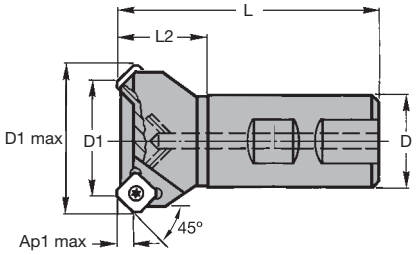
Thick inserts for reliability and high MRR capability.

Integrated wiper facet: Good surface finish in heavy roughing applications.

Positive rake angle:
- Soft cutting action.
- Less spindle power requirement.
- Less chipping on workpiece in cast iron.
- Less burs on workpiece in steel.
- High feed rate capability.

- Four cutting edges.
- Strong tool body design.
- Excellent chip evacuation.





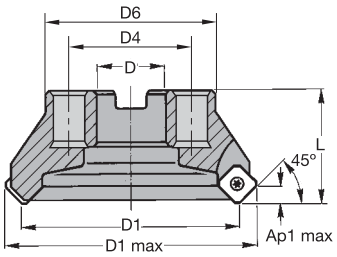
Weldon Shanks

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	0,35

Spare Parts

D1	 insert screw	 Nm	 Torx driver
20	**12148007200**	3,5	**12148007500**
25	**12148007200**	3,5	**12148007500**

- Four cutting edges.
- Strong tool body design.
- Excellent chip evacuation.



Shell Mills

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

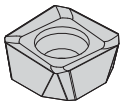
Spare Parts

D1	 insert screw	 Nm	 Torx driver
50	**12148007200**	3,5	**12148007500**
63	**12148007200**	3,5	**12148007500**
80	**12148007200**	3,5	**12148007500**
100	**12148007200**	3,5	**12148007500**
125	**12148007200**	3,5	**12148007500**
160	**12148007200**	3,5	**12148007500**

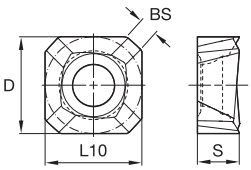
Insert Selection Guide

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	TN7535	**…31**	**WP35CM**	…31	WP35CM
P5–P6	…20	TN7535	**…31**	**WP35CM**	…31	WP35CM
M1–M2	…20	TN6540	**…31**	**WP25PM**	…31	WP25PM
M3	...20	TN7535	**…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	–	–	**–**	**–**	–	–

Inserts • SN1205..



SNKT-20
SNKT-21



● first choice
○ alternate choice

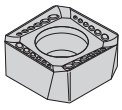
P		●	●	●		●	●					
M		●	○	○		●	○					
K		○		○	●			○				
N								●				
S		●				○		○				
H												

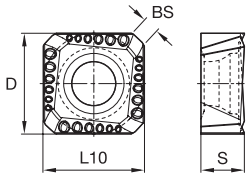
SNKT-20

catalogue number	cutting edges	D	L10	S	BS	hm	TN6540	TN7525	TN7535	WK15CM	WP40PM	TT125	THM
SNKT1205AZER20	4	12,70	12,70	5,51	2,00	0,10	2964201	2022370	2020691	-	-	2022371	-

SNKT-21

catalogue number	cutting edges	D	L10	S	BS	hm	TN6540	TN7525	TN7535	WK15CM	WP40PM	TT125	THM
SNKT1205AZR21	4	12,70	12,70	5,56	1,54	0,15	-	2022373	-	5427383	-	2022374	2022375


SNMT-31

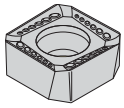


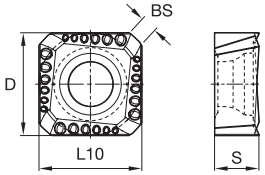
● first choice
○ alternate choice

		TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WP35CM	WP40PM	TTI25	THM
P		●	●	●	●		●	●	●	●	
M		○	●	○	○		●	●	●	○	
K		○	○		○	●	○				○
N							●				●
S			●					●	○		○
H							○				

■ SNMT-31

catalogue number	cutting edges	D	L10	S	BS	hm	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WP35CM	WP40PM	TTI25	THM
SNMT1205AZR31	4	12,70	12,70	5,56	1,54	0,16	2964206	2964204	2020673	2020663	5427382	5895536	5895537	5551088	-	-


SNKT-31

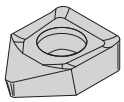


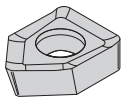
● first choice
○ alternate choice

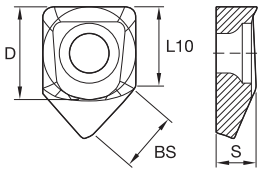
		TN6525	TN6540	TN7525	TN7535	WK15CM	WP40PM	TTI25	THM
P		●	●	●	●		●	●	
M		○	●	○	○		●	○	
K		○	○		○	●			○
N									●
S			●				○		○
H									

■ SNKT-31

catalogue number	cutting edges	D	L10	S	BS	hm	TN6525	TN6540	TN7525	TN7535	WK15CM	WP40PM	TTI25	THM
SNKT1205AZR31	4	12,70	12,70	5,56	1,54	0,16	2964208	2964205	2020683	2020677	5427384	-	-	-


XNKT-12 Wiper


XNKT-11 Wiper



● first choice
○ alternate choice

		TN6540	TN7525	TN7535	WK15CM	WP40PM	TTI25	THM
P		●	●	●		●	●	
M		●	○	○		●	○	
K		○		○	●			○
N								●
S		●				○		○
H								

■ XNKT-12 Wiper

catalogue number	cutting edges	D	L10	S	BS	hm	TN6540	TN7525	TN7535	WK15CM	WP40PM	TTI25	THM
XNKT1205AZTR12	1	12,70	12,70	5,15	8,00	0,04	-	2015264	-	-	-	2015266	-

■ XNKT-11 Wiper

catalogue number	cutting edges	D	L10	S	BS	hm	TN6540	TN7525	TN7535	WK15CM	WP40PM	TTI25	THM
XNKT1205AZER11	1	12,70	12,70	5,15	8,00	0,04	-	2015242	-	5427381	-	2015244	2015246

Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			TN7525			TN7535		
P	1	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445
	2	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275
	3	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245
	4	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190
	5	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250
	6	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130
M	1	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185
	2	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170
	3	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140
K	1	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290
	2	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230
	3	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190
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	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

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.

Recommended Starting Feeds

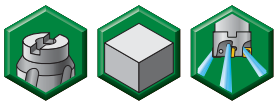
Recommended Starting Feeds [mm]

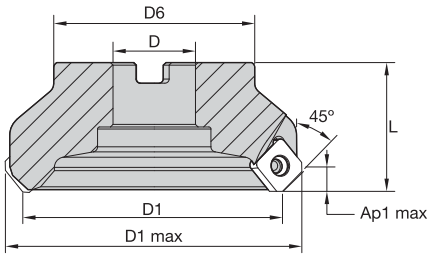
Light Machining	General Purpose	Heavy Machining

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.

- Four cutting edges.
- Strong tool body design.
- Thick inserts for reliability.





Shell Mills

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

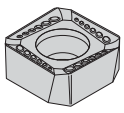
Spare Parts

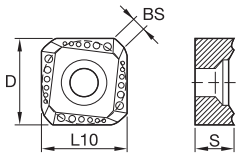
D1	insert screw	Nm	Torx driver
100	**12148007200**	3,5	**12148007500**

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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	–	–	**–**	**–**	–	–

Inserts • SN1505..


SNMT-31

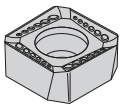


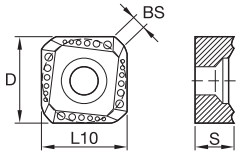
● first choice
○ alternate choice

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

SNMT-31

catalogue number	cutting edges	D	L10	S	BS	hm	TN7525	TN7535	WK15CM
SNMT1505AZR31	4	16	15,88	5,56	2,00	0,16	2020701	2020695	5427386


SNKT-31



● first choice
○ alternate choice

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

SNKT-31

catalogue number	cutting edges	D	L10	S	BS	hm	TN7525	TN7535	WK15CM	WP25PM	WP35CM	WP40PM
SNKT1505AZR31	4	16	15,88	5,56	2,00	0,16	2020711	2020705	5427385	5895538	5895539	5895540

Recommended Starting Speeds [m/min]

Material Group		TN6525			TN7525			TN7535			WK15CM			WP25PM			WP35CM			WP40PM		
P	1	410	**320**	280	410	**310**	280	545	**475**	445	–	**–**	–	395	**340**	325	545	**475**	445	355	**310**	295
	2	320	**250**	215	310	**250**	215	335	**305**	275	–	**–**	–	330	**290**	240	335	**305**	275	300	**260**	215
	3	280	**215**	185	280	**215**	185	305	**275**	245	–	**–**	–	305	**260**	210	305	**275**	245	275	**235**	190
	4	235	**170**	145	235	**170**	145	230	**210**	190	–	**–**	–	270	**220**	180	230	**210**	190	245	**205**	160
	5	310	**235**	200	310	**235**	200	310	**275**	250	–	**–**	–	220	**205**	180	310	**275**	250	205	**185**	160
	6	205	**160**	130	205	**160**	130	190	**160**	130	–	**–**	–	200	**150**	120	190	**160**	130	180	**140**	110
M	1	190	**120**	80	245	**220**	185	245	**220**	185	–	**–**	–	245	**215**	200	245	**220**	185	235	**205**	185
	2	120	**80**	50	220	**190**	170	220	**190**	170	–	**–**	–	220	**190**	155	220	**190**	170	210	**180**	150
	3	125	**80**	55	175	**155**	140	175	**155**	140	–	**–**	–	170	**145**	115	175	**155**	140	155	**140**	110
K	1	275	**245**	220	380	**280**	240	355	**320**	290	505	**460**	410	275	**245**	220	355	**320**	290	–	**–**	–
	2	215	**190**	180	325	**240**	200	280	**250**	230	400	**355**	330	215	**190**	180	280	**250**	230	–	**–**	–
	3	180	**160**	145	240	**200**	170	235	**210**	190	335	**300**	275	180	**160**	145	235	**210**	190	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	50	**40**	30	–	**–**	–	50	**40**	35
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	50	**40**	30	–	**–**	–	50	**40**	35
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	60	**50**	30	–	**–**	–	60	**50**	35
	4	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	85	**60**	40	80	**60**	40	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.

Recommended Starting Feeds

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%			
...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	0,33	**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.

NOVO KNOWS SEARCH

Searching for a tool by using the outdated method of a catalogue has been replaced with the Advise and Select functions from NOVO™ — saving you time and money.

ADVISE

Uses a rules-based approach to provide cutting tool recommendations:

- Define Machining Feature (face milling, slotting, blind hole, etc.)
- Apply Constraint Requirements (geometric, material, tolerance, etc.)
- Set Machining Sequence (single or multi-step operations, rough then finish, etc.)
- Receive Ranked Results

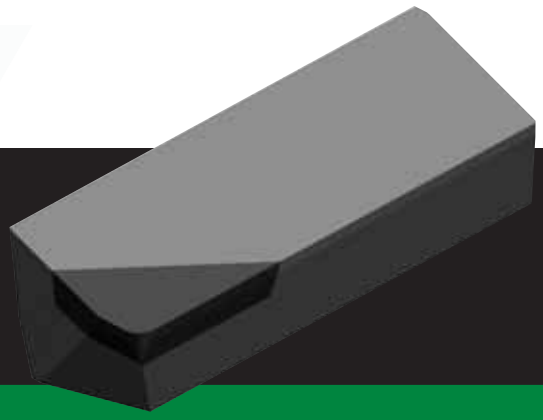
SELECT

A method of selecting cutting tools from a tree structure via a hierarchy or parametric search:

- If you know which product you are looking for, a quick search can be performed by just the catalogue number or product description.
- Smart filters significantly reduce the amount of potential tooling solutions.
- After the tool is selected, NOVO also provides cutting and adaptive item options that fit with your solution.

NOVO can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. **widia.com/novo**

The new SuperFeed face mills and end mills are the first choice platform for machining aluminium in the transportation and general engineering industries.



SuperFeed

Our unique insert design delivers exceptional stability and performance. Reduced complexity with exceptional finishing capabilities make SuperFeed the go-to platform in aluminium and non-ferrous face and end milling applications.

- Durable cutter body protection.
- Five PCD cartridge options for increased flexibility.
- User-friendly axial adjustment 0,3–0,8mm.
- Reduce overall tooling costs with reconditioning options.

Features	Benefits
• Anodised aluminium cutter bodies.	• Durable and lightweight.
• Easy axial adjustment range 0,3–0,8mm.	• Simple and very user-friendly.
• DovLok™ PCD cartridge design.	• Proven in demanding automotive applications.
• Fine pitch cutters.	• Shorter cycle times, higher MRR and productivity.

Face Mills

SuperFeed™

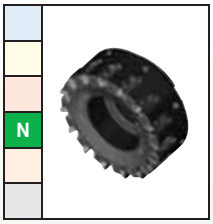
Max depth of cut: 6,35mm
(can be less depending on the cartridge)

Lead angle: 90°

Indexes per insert:
1 edge per PCD cartridge

Diameter: Standard Platform
63–200mm

Pages: H64–H68



Insert Offering

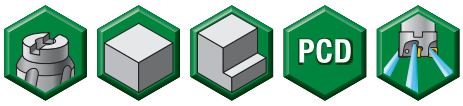
SDR/EDR

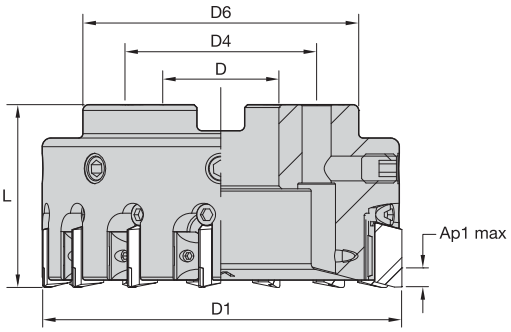
Corner Radii:
SDR — 0,8mm and 2,36mm
EDR — 0,8mm

Axial DOC:
SDR — 6,35mm max
EDR — 6,35mm max

WIDIA™ Grade WDN00U™:
- Ultra fine grain PCD.
- Long tool life, consistent results, excellent surface qualities.

- Through coolant capability.
- +/- 3 micron axial adjustment range.
- Balanced design.
- Easy setup in a simple system design.
- Modified standards available.





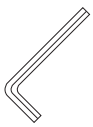
Face Mills • Metric

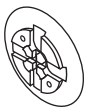
order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	Z ADJ	kg	max RPM
5363208	**SF06306RH**	63	22	–	60	40	6	6	6	0,45	20000
5363209	**SF08008RH**	80	27	–	77	50	6	8	8	0,63	20000
5363220	**SF10012RH**	100	32	–	97	50	6	12	12	1,13	17320
5363221	**SF12515RH**	125	40	–	122	63	6	15	15	2,30	15500
5363222	**SF16018RH**	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.

Spare Parts



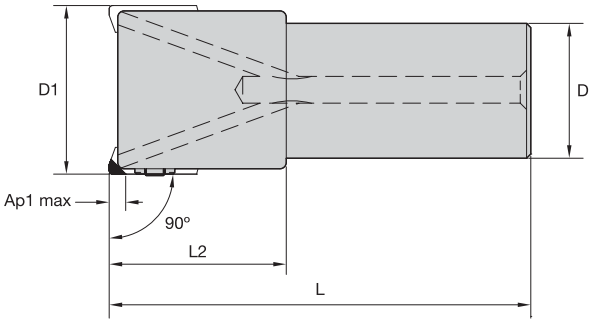





D1	wedge screw	wrench size wedge screw	adjusting screw	wrench size-adjusting screw	coolant cap	coolant shower plate	wedge
63	**LS103**	3 mm	**SWSM515**	4 mm	**SALS063**	–	**HDWM5EU4DD**
80	**LS103**	3 mm	**SWSM515**	4 mm	**SALS080**	–	**HDWM5EU4DD**
100	**LS103**	3 mm	**SWSM515**	4 mm	**SALS100**	–	**HDWM5EU4DD**
125	**LS103**	3 mm	**SWSM515**	4 mm	**SALS125**	–	**HDWM5EU4DD**
160	**LS103**	3 mm	**SWSM515**	4 mm	**SALS160**	–	**HDWM5EU4DD**
200	**LS103**	3 mm	**SWSM515**	4 mm	–	**SSP8**	**HDWM5EU4DD**

NOTE: Coolant cap or coolant shower plate must be ordered separately.

- Through coolant capability.
- +/- 3 micron axial adjustment range.
- Easy setup in a simple system design.
- Modified standards available.

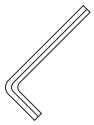


End Mills • Metric

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.

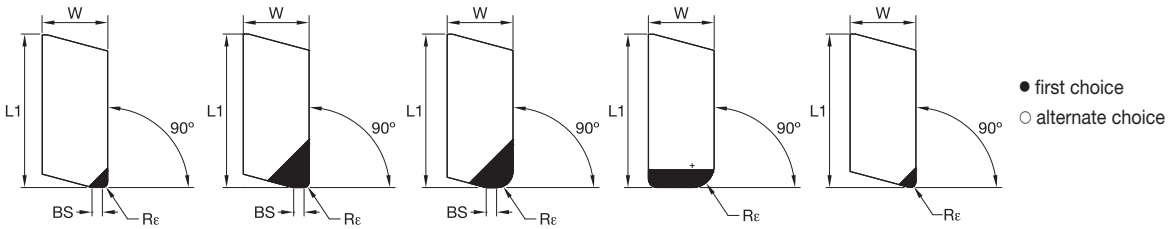
Spare Parts

D1	 wedge screw	wrench size wedge screw	 wedge	 adjusting screw	 wrench size- adjusting screw
25	**DSM550**	3 mm	**HDWM5S**	**SWSM5155**	4 mm
32	**DSM550**	3 mm	**HDWM5S**	**SWSM5155**	4 mm
40	**DSM550**	3 mm	**HDWM5S**	**SWSM5155**	4 mm
50	**DSM550**	3 mm	**HDWM5S**	**SWSM5155**	4 mm

NOTE: For setting procedure, see page H68.

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	–	–	–	–	–	–



● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

PCD Inserts • Face Mills • SDR

catalogue number	cutting edges	L1	BS	W	Rε	hm	WDN00U
SDR100031E0NW	1	22,23	–	9,53	0,79	0,02	5358450
SDR100031E0W4	1	22,23	1,52	9,53	0,79	0,02	5358407
SDR100031E1W4	1	22,23	1,52	9,53	0,79	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

PCD Inserts • End Mills • EDR

catalogue number	cutting edges	L1	BS	W	Rε	hm	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.

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	–	–	–

Recommended Starting Feeds

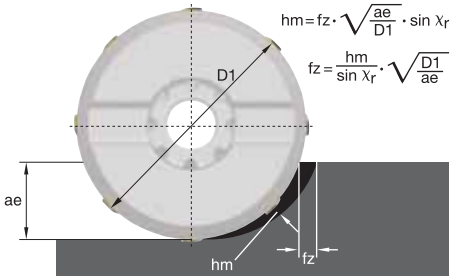
Recommended Starting Feeds [mm]

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



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.

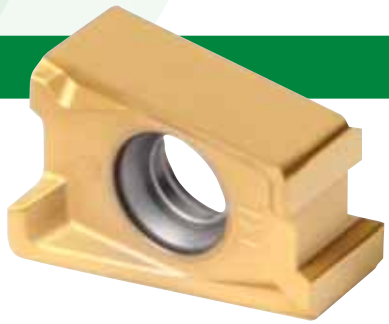
Face Mills

- 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.

Making the Grade in Innovative Metalcutting Technology



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

Victory™ Milling Grades

Our new Victory Milling Grades are designed to deliver higher productivity, longer tool life, and increased application versatility.

- WP40PM™ — New best-in-class Victory milling grade for machining steel materials in ISO material group P40 in rough milling applications.
- WK15CM™ — New milling grade for cast irons for higher tool life and increased productivity.
- WS30PM™ — A new high-performance milling grade for machining titanium and stainless steels.

To learn more about the benefits of the new **WIDIA™ Victory milling grades**, contact your local distributor.

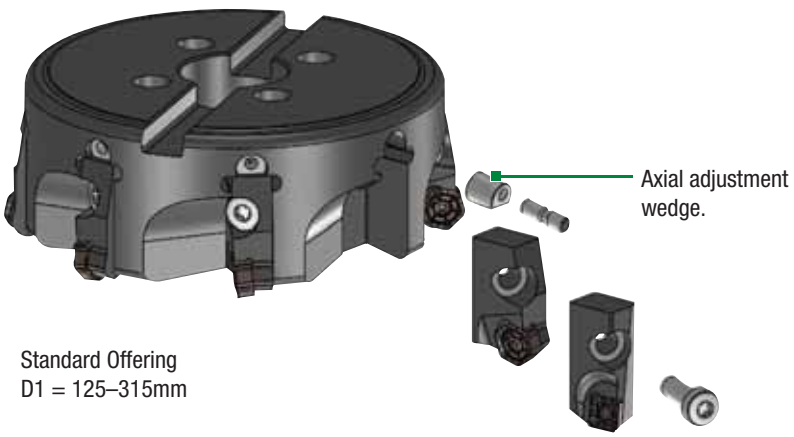
WIDIA™

M4000

Cartridges with different insert styles and lead angles can be easily changed.

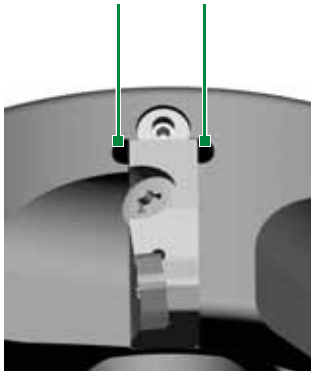
- Roughing and finishing solution with a single tool.
- Adjustable pockets and cartridge stop feature.
- Easily change cartridges with different insert styles and lead angles.
- Best-in-class flexibility lowers cost per tool.
- Easy runout adjustment.
- Perfect floor surface for finishing operations.

Roughing and Finishing with a Single Tool



Standard Offering
D1 = 125–315mm

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



Face Mills

M4000
Cartridge Milling System

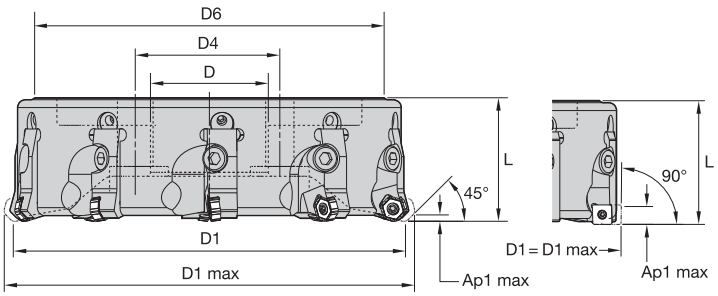
All front line insert styles available.

Diameter: 125–315mm

Pages: H72–H74

P
M
K
N
S
H

- Roughing and finishing with a single tool.
- Quick cartridge stop feature.
- Easy runout adjustment.
- Easy change of cartridges with different insert styles and lead angles.



Cartridge Milling System

order number	catalogue number	D1	D	D4	D6	L	number of cartridges	kg
4136343	**M4000D125Z06ADJ**	125	40	–	108	68,0	6	3,34
4136344	**M4000D125Z08ADJ**	125	40	–	108	68,0	8	3,51
4136345	**M4000D160Z08ADJ**	160	40	66,7	137	63,0	8	5,19
4136346	**M4000D160Z12ADJ**	160	40	66,7	137	63,0	12	5,20
4136347	**M4000D200Z10ADJ**	200	60	101,6	178	63,0	10	8,02
4136348	**M4000D200Z14ADJ**	200	60	101,6	178	80,0	14	12,57
4136349	**M4000D250Z12ADJ**	250	60	101,6	228	63,0	12	13,53
4136350	**M4000D250Z18ADJ**	250	60	101,6	228	63,0	18	13,90
4136351	**M4000D315Z16ADJ**	315	60	101,6	293	80,0	16	25,08
4136352	**M4000D315Z22ADJ**	315	60	101,6	293	80,0	22	25,42

Spare Parts

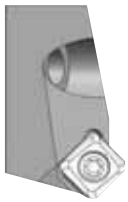
D1	cartridge screw	Nm	wedge	adjusting screw
125	**MS1294**	20,0	**12748308500**	**12748600900**
160	**MS1294**	20,0	**12748308500**	**12748600900**
200	**MS1294**	20,0	**12748308500**	**12748600900**
250	**MS1294**	20,0	**12748308500**	**12748600900**
315	**MS1294**	20,0	**12748308500**	**12748600900**

Cartridge

order number	catalogue number	insert style	master platform *	Ap max
4159022	M4000CA-AD1505	AD.T1505	CIP	14,0
4159020	M4000CA-AP1003	AP.T1003	CIP	10,2
4159021	M4000CA-AP1604	AP.T1604	CIP	16,2
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
3954792	M4000CA-HN09HF	HN.J0905	M1200	2,2
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
2006374	M4000CA-SE1203	SE.N1203/SE.R1203	M68	6,0
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	6,4
2006360	M4000CA-SN15	SN.T1505	M660	8,0
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
2006379	M4000CA-TP2204	TP.N2204/TP.R2204	M40	18,0
2006347	M4000CA-XP16	XP.T1604	M680	14,0

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

	 M4000CA-MDHX10CA	 M4000CA-HN07HF	 M4000CA-HN07	 M4000CA-HN07HD	 M4000CA-HN09HF	 M4000CA-HN09	 M4000CA-HN09HD	 M4000CA-HP06
	order number 2006361	order number 4159017	order number 3968124	order number 4159018	order number 3954792	order number 3126691	order number 4159019	order number 2511344
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
125	125	139	134	132	143	136	133	131,4
160	160	174	169	167	178	171	168	166,4
200	200	214	209	207	218	211	208	206,4
250	250	264	259	257	268	261	258	256,4
315	315	329	324	322	333	326	323	321,4

	 M4000CA-SN12	 M4000CA-SN12RC	 M4000CA-SN15	 M4000CA-XP16	 M4000CA-AP1003	 M4000CA-AD1505	 M4000CA-AP1604	 M4000CA-SD1204	 M4000CA-SD1506
	order number 2006348	order number 2006357	order number 2006360	order number 2006347	order number 4159020	order number 4159022	order number 4159021	order number 2067492	order number 2006359
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
125	139,3	139,3	143	125	125	125	125	125	125
160	174,3	174,3	178	160	160	160	160	160	160
200	214,3	214,3	218	200	200	200	200	200	200
250	264,3	264,3	268	250	250	250	250	250	250
315	329,3	329,3	333	315	315	315	315	315	315

	 M4000CA-RC1606	 M4000CA-SE1203	 M4000CA-SE1204	 M4000CA-SE1504	 M4000CA-SP1203	 M4000CA-SP12 Wiper	 M4000CA-SP1504	 M4000CA-TP1603	 M4000CA-TP2204
	order number 2006346	order number 2006374	order number 2033495	order number 2006377	order number 2006373	order number 2006362	order number 2006376	order number 2033496	order number 2006379
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
125	125	139	139	143	130,6	132,2	132,2	125	125
160	160	174	174	178	165,6	167,2	167,2	160	160
200	200	214	214	218	205,6	207,2	207,2	200	200
250	250	264	264	268	255,6	257,2	257,2	250	250
315	315	329	329	333	320,6	322,2	322,2	315	315

Reduced Complexity with Exceptional Finishing Capabilities

EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

SuperFeed™

The new SuperFeed face mills and end mills are the first choice PCD platform for machining aluminium in the transportation and general engineering industries.

- Durable, lightweight anodised aluminium cutter body.
- DovLok PCD cartridge design.
- Simple, user-friendly axial adjustment range from 0,3–0,8mm.
- Fine-pitch cutters reduce cycle times while offering higher MRR and productivity.
- Reduce overall tooling costs with reconditioning.

To learn more about the benefits of **WIDIA™ SuperFeed**, contact your local distributor.

WIDIA™

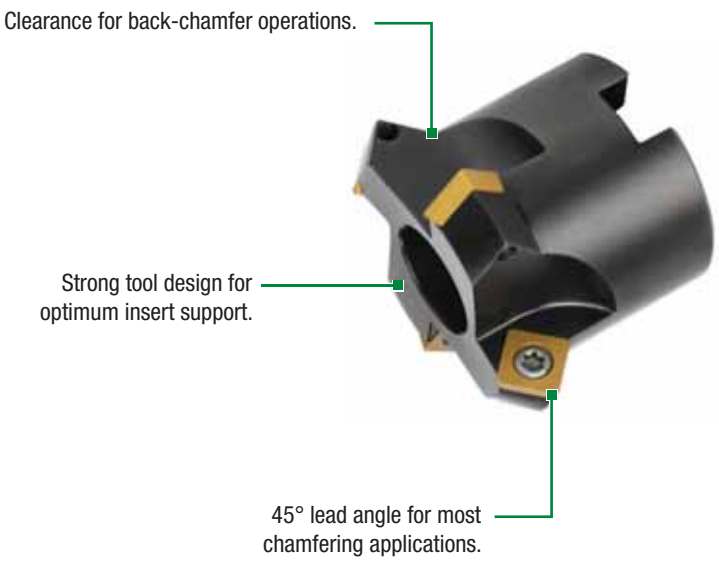
Indexable Milling • Chamfer Mills

M25™ Series Chamfer Mills

M25

M25 Series Chamfer Mills are the ideal tool of choice for milling all steel, stainless steel, and cast iron materials. With clearance for back-chamfer operations, the M25 Series will help streamline your most challenging milling operations.

- Strong tool design for optimum insert support.
- 45˚ lead angle for most chamfering applications.



Chamfer Mills

M25™ SD0903..

Max depth of cut: 6,4mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 25–40mm

Pages: I4–I6, I8, I10

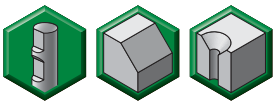
M25 SP1204..

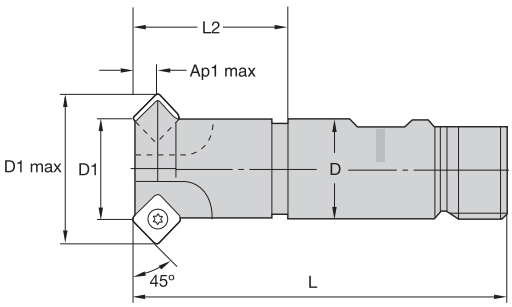
Max depth of cut: 8,3mm

Lead angle: 45°
Indexes per insert: 4
Diameter: 50–63mm

Pages: I7, I9–I10

- Chamfer milling in steel, stainless steel, and cast iron.





Weldon Shanks

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

Spare Parts

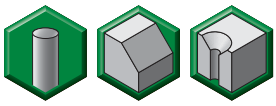
insert screw

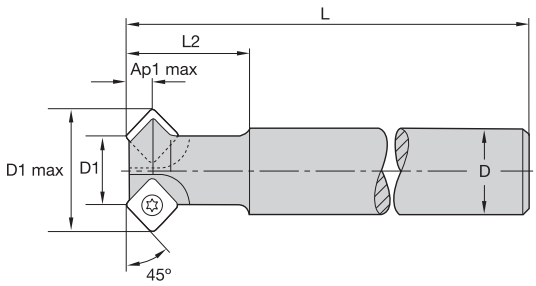
Nm

Torx wrench

insert screw	Nm	Torx wrench
12148095100	3,0	**12148000600**

- Chamfer milling in steel, stainless steel, and cast Iron.





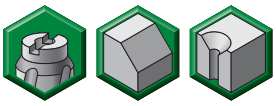
Cylindrical Shanks

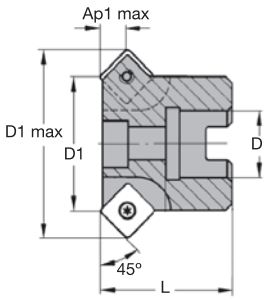
order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	insert 1	coolant supply	kg
2022634	**12292550400**	16	28,8	16	200	27	6,4	2	SD..0903..	No	0,40
2022635	**12292550800**	25	37,8	25	200	40	6,4	2	SD..0903..	No	0,70
2022636	**12292551000**	32	44,8	32	200	40	6,4	3	SD..0903..	No	1,20

Spare Parts

insert screw	Nm	Torx driver
12148095100	3,0	**12148000600**

- Chamfer milling in steel, stainless steel, and cast iron.





Shell Mills

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.

Spare Parts

insert screw

12148095100

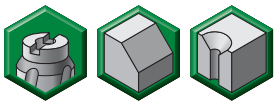
Nm

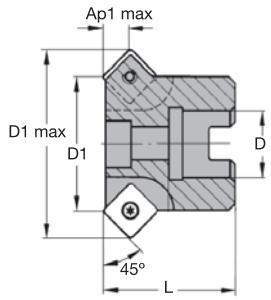
3,0

Torx driver

12148000600

- Chamfer milling in steel, stainless steel, and cast Iron.





Shell Mills

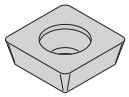
order number	catalogue number	D1	D1 max	D	L	Ap1 max	Z	insert 1	coolant supply	kg
2022632	**12292511400**	50	66,7	22	40	8,3	4	SP..1204..	No	0,90
2022633	**12292511600**	63	79,7	22	40	8,3	5	SP..1204..	No	1,10

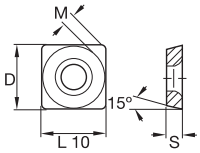
Spare Parts

 insert screw	 Nm	 Torx driver
12148007200	4,0	**12148007500**

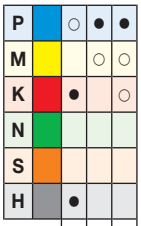
Insert Selection Guide for Insert Style SD09

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	. ..	TN7525	. ..	**TN7525**	. ..	TN7525
P3–P4	. ..	TN7525	. ..	**TN7535**	. ..	TN7535
P5–P6	. ..	TN7525	. ..	**TN7535**	. ..	TN7535
M1–M2	. ..	TN7525	. ..	**TN7525**	. ..	TN7525
M3	. ..	TN7535	. ..	**TN7535**	. ..	TN7535
K1–K2	–	–	–	–	–	–
K3	. ..	TN7535	. ..	**TN7535**	. ..	TN7535
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	. ..	TN2510	–	–	–	–


SDNT

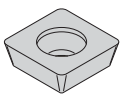


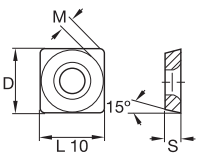
● first choice
○ alternate choice



SDNT

catalogue number	cutting edges	D	L10	M	S	hm	TN2510	TN7525	TN7535
SDNT090308	4	9,53	9,53	1,64	3,18	0,10	–	2030200	2030198
SDNT090308T	4	9,53	9,53	1,64	3,18	0,10	2028336	–	–


SDMW



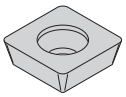
● first choice
○ alternate choice

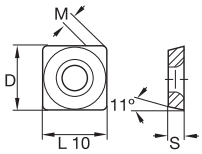
SDMW

catalogue number	cutting edges	D	L10	M	S	hm	TN7525	THM
SDMW090308	4	9,53	9,53	1,64	3,18	0,10	2105263	2028332

Insert Selection Guide for Insert Style SP12

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	. ..	TN7525	. ..	**TN7525**	. ..	TN7525
P3–P4	. ..	TN7525	. ..	**TN7535**	. ..	TN7535
P5–P6	. ..	TN7525	. ..	**TN7535**	. ..	TN7535
M1–M2	. ..	TN7525	. ..	**TN7525**	. ..	TN7525
M3	. ..	TN7535	. ..	**TN7535**	. ..	TN7535
K1–K2	. ..	WK15CM	. ..	**WK15CM**	. ..	WK15CM
K3	. ..	TN7535	. ..	**WK15CM**	. ..	WK15CM
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	–	–	–	–	–	–


SPNT

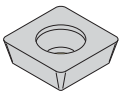


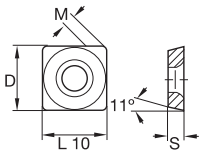
● first choice
○ alternate choice

P		●	●
M		○	○
K			○
N			
S			
H			

SPNT

catalogue number	cutting edges	D	L10	M	S	hm	TN7525	TN7535
SPNT120408	4	12,70	12,70	2,30	4,76	0,10	2029794	2029792


SPMW



● first choice
○ alternate choice

P			
M			
K		○	●
N		●	
S		○	
H			

SPMW

catalogue number	cutting edges	D	L10	M	S	hm	THM	WK15CM
SPMW120408	4	12,70	12,70	2,30	4,76	0,14	2014066	5427380

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN7525			TN7535			WK15CM			THM		
P	1	660	**580**	540	410	**310**	280	545	**475**	445	–	**–**	–	–	**–**	–
	2	410	**370**	330	310	**250**	215	335	**305**	275	–	**–**	–	–	**–**	–
	3	370	**330**	305	280	**215**	185	305	**275**	245	–	**–**	–	–	**–**	–
	4	275	**260**	230	235	**170**	145	230	**210**	190	–	**–**	–	–	**–**	–
	5	330	**300**	275	310	**235**	200	310	**275**	250	–	**–**	–	–	**–**	–
	6	230	**205**	175	205	**160**	130	190	**160**	130	–	**–**	–	–	**–**	–
M	1	270	**240**	210	245	**220**	185	245	**220**	185	–	**–**	–	–	**–**	–
	2	245	**210**	190	220	**190**	170	220	**190**	170	–	**–**	–	–	**–**	–
	3	190	**175**	150	175	**155**	140	175	**155**	140	–	**–**	–	–	**–**	–
K	1	420	**360**	300	380	**280**	240	355	**320**	290	505	**460**	410	145	**110**	90
	2	360	**300**	250	325	**240**	200	280	**250**	230	400	**355**	330	150	**120**	85
	3	300	**250**	200	240	**200**	170	235	**210**	190	335	**300**	275	155	**115**	70
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	1080	**720**	600
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	820	**560**	460
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	540	**335**	240
S	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz)			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.

Reconditioning Services

Anyone can regrind our tools – but only we can recondition them

WIDIA™ Reconditioning Services optimise the value of metalcutting tools throughout their entire lifecycle by giving like-new performance — with rapid turnaround time — so tools are always on hand and perform just like new.

To use WIDIA™ tool reconditioning services, contact your authorised WIDIA distributor to get started.

Global Reconditioning Network

To locate a Reconditioning Center near you, visit **widia.com/services.**

WIDIA™


WIDIA

Indexable Milling • 90° Shoulder Mills

VSM11

Victory™ Shoulder Mill 11™ is a high-performance, versatile, robust, 90° square shoulder milling platform. VSM11 is designed for versatility, low horsepower consumption, and easy cutting action. Cutters can be used for profiling, face milling, slotting, ramping, helical interpolation, circular interpolation, and other milling applications. Inserts are specially designed with innovative geometries and features like variable rake angles, negative T-land, small hone, and the latest Victory grades enhancing tool performance and versatility.

Take advantage of the high-performance, advanced carbide substrates, coatings, and surface treatment technologies of the available 6 Victory grades, 5 geometries, and broad range of cutter body product portfolio. This platform works with multiple material types and applications.

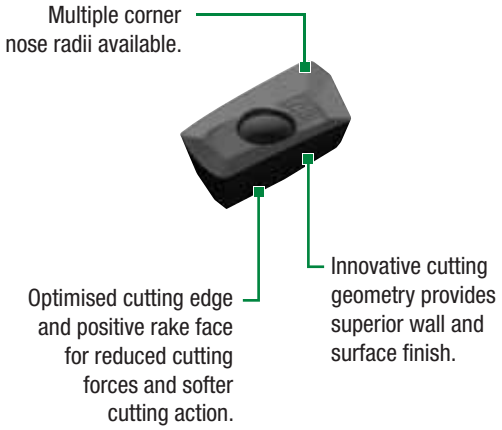
- State-of-the-art step down capability.
- Screw-on, end mill, and shell mill cutters with effective internal coolant supply.

Features

- Insert geometries and grades for all workpiece materials.
- Insert corner radius from 0,4–3,1mm (.016–.122").

Benefits

- Achieve 90° wall finish.
- Longer tool life.
- Latest WIDIA Victory milling grades for all workpiece materials.
- Soft cutting action, reduced cycle times, and low horsepower consumption.
- Stability and reliability.



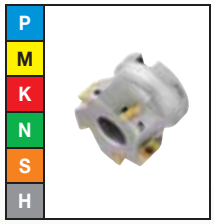
90° Shoulder Mills

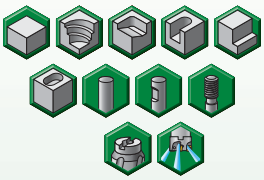
VSM11™

Max depth of cut: 11,7mm

Lead angle: 90°
Indexes per insert: 2
Diameter: 16–125mm

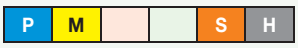
Pages: J4–J16





Insert Offering

XDCT-ML



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

XDPT-MM

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

XDPT-MH

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

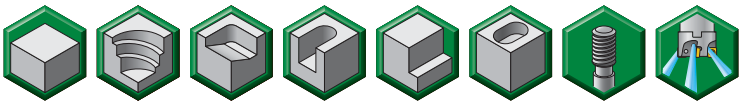
XDCT-ALP

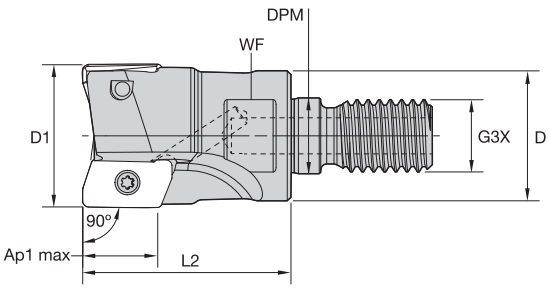
Roughing and finishing of aluminium alloys.
High precision.
Periphery ground.

XDCW-PCD

Roughing and finishing of aluminium alloys.
Abrasive non-ferrous materials.
High precision.
Periphery ground.

- True 90° capability.
- Increased ramping capability.
- Superior wall and surface finish.
- Effective internal coolant feature, precisely reaching the cutting edge.





Screw-On End Mills

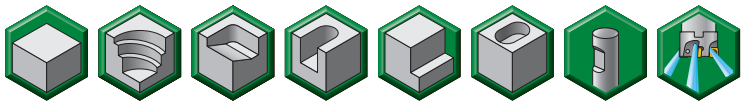
order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5417011	**VSM11D016Z02M08XD11**	16	13	8,5	M8	25	10	11,5	2	10.0°	Yes	41400	0,02
5417013	**VSM11D020Z03M10XD11**	20	18	10,5	M10	28	15	11,6	3	7.8°	Yes	35100	0,05
5417015	**VSM11D025Z04M12XD11**	25	21	12,5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

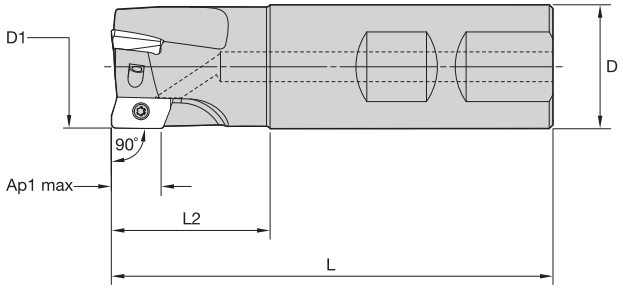
Spare Parts

insert screw	Nm	wrench
192.432	1,0	**170.028**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.

- True 90° capability.
- Increased ramping capability.
- Superior wall and surface finish.
- Effective internal coolant feature, precisely reaching the cutting edge.





Weldon Shanks

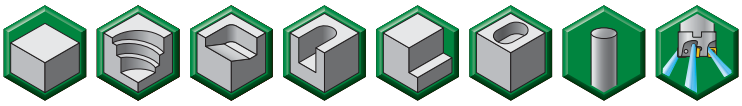
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5416454	**VSM11D012Z01B16XD11**	12	16	70	21	11,7	1	3.7°	Yes	53100	0,08
5416455	**VSM11D016Z02B16XD11**	16	16	70	21	11,5	2	10.0°	Yes	41400	0,09
5416457	**VSM11D020Z02B20XD11**	20	20	81	30	11,6	2	7.8°	Yes	35100	0,15
5416458	**VSM11D020Z03B20XD11**	20	20	81	30	11,6	3	7.8°	Yes	35100	0,16
5416459	**VSM11D025Z03B25XD11**	25	25	88	31	11,5	3	5.3°	Yes	30200	0,27
5416480	**VSM11D025Z04B25XD11**	25	25	88	31	11,5	4	5.3°	Yes	30200	0,28
5416481	**VSM11D030Z04B25XD11**	30	25	88	31	11,5	4	3.2°	Yes	26900	0,30
5416482	**VSM11D032Z04B32XD11**	32	32	100	39	11,4	4	3.6°	Yes	25800	0,51
5416483	**VSM11D032Z05B32XD11**	32	32	100	39	11,4	5	3.6°	Yes	25800	0,52

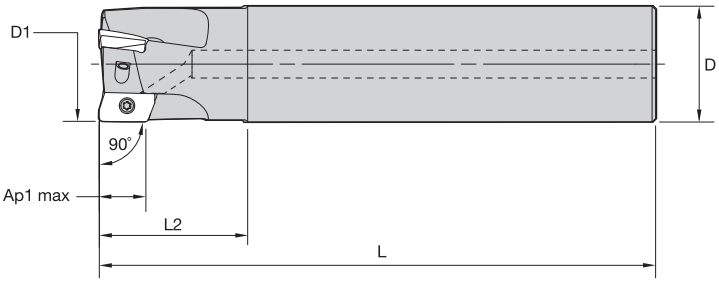
Spare Parts

 insert screw	 Nm	 wrench
192.432	1,0	**170.028**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.

- True 90° capability.
- Increased ramping capability.
- Superior wall and surface finish.
- Effective internal coolant feature, precisely reaching the cutting edge.





Cylindrical End Mills

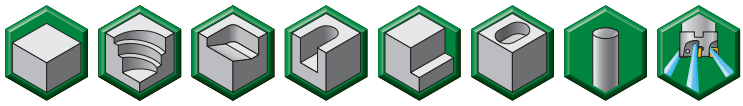
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5416632	**VSM11D012Z01A16XD11L100**	12	16	100	25	11,7	1	3.7°	Yes	53100	0,13
5416633	**VSM11D016Z02A16XD11L100**	16	16	100	31	11,5	2	10.0°	Yes	41400	0,12
5416634	**VSM11D020Z02A20XD11L110**	20	20	110	31	11,6	2	7.8°	Yes	35100	0,22
5416635	**VSM11D020Z03A20XD11L110**	20	20	110	31	11,6	3	7.8°	Yes	35100	0,23
5416636	**VSM11D025Z03A25XD11L120**	25	25	120	33	11,5	3	5.3°	Yes	30200	0,39
5416637	**VSM11D025Z04A25XD11L120**	25	25	120	33	11,5	4	5.3°	Yes	30200	0,40
5416638	**VSM11D032Z03A32XD11L130**	32	32	130	41	11,4	3	3.6°	Yes	25800	0,70
5416639	**VSM11D032Z05A32XD11L130**	32	32	130	41	11,4	5	3.6°	Yes	25800	0,71

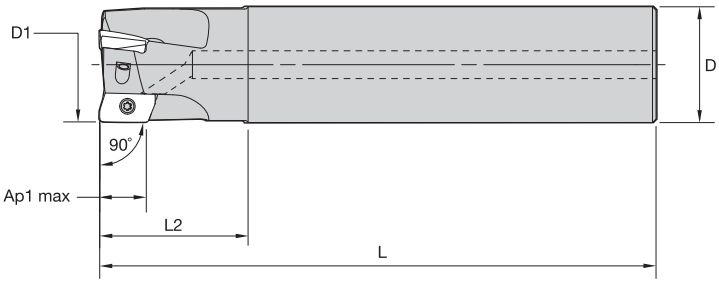
Spare Parts

insert screw	Nm	wrench
192.432	1,0	**170.028**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.

- True 90° capability.
- Increased ramping capability.
- Superior wall and surface finish.
- Effective internal coolant feature, precisely reaching the cutting edge.





Cylindrical End Mills • Long Shanks

order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5416700	**VSM11D016Z02A16XD11L170**	16	16	170	25	11,5	2	10.0°	Yes	41400	0,23
5416701	**VSM11D018Z02A16XD11L170**	18	16	170	25	11,6	2	9.7°	Yes	37900	0,23
5416702	**VSM11D020Z02A20XD11L170**	20	20	170	41	11,6	2	7.8°	Yes	35100	0,35
5416703	**VSM11D020Z03A20XD11L170**	20	20	170	41	11,6	3	7.8°	Yes	35100	0,36
5416704	**VSM11D022Z03A20XD11L170**	22	20	170	30	11,5	3	6.6°	Yes	32900	0,37
5416705	**VSM11D025Z03A25XD11L210**	25	25	210	50	11,5	3	5.3°	Yes	30200	0,70
5416706	**VSM11D025Z04A25XD11L210**	25	25	210	50	11,5	4	5.3°	Yes	30200	0,72
5416707	**VSM11D032Z03A32XD11L250**	32	32	250	65	11,4	3	3.6°	Yes	25800	1,39

Spare Parts

insert screw

192.432

Nm

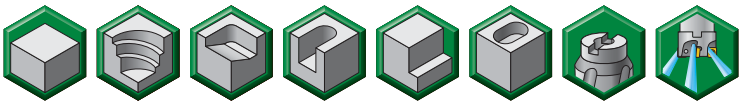
1,0

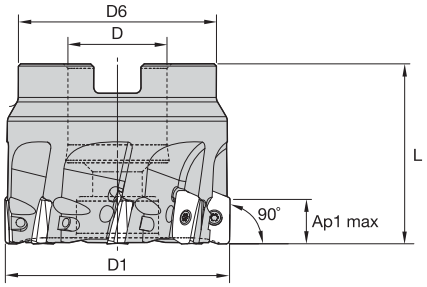
wrench

170.028

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.

- True 90° capability.
- Increased ramping capability.
- Superior wall and surface finish.
- Effective internal coolant feature, precisely reaching the cutting edge.





Shell Mills

order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5416316	**VSM11D040Z04S016XD11**	40	16	37	40	11,4	4	2.6°	Yes	22600	0,22
5416317	**VSM11D040Z06S016XD11**	40	16	37	40	11,4	6	2.6°	Yes	22600	0,22
5416318	**VSM11D050Z05S022XD11**	50	22	44	40	11,3	5	1.9°	Yes	19900	0,33
5416319	**VSM11D050Z08S022XD11**	50	22	44	40	11,3	8	1.9°	Yes	19900	0,33
5416340	**VSM11D063Z06S022XD11**	63	22	44	40	11,3	6	1.5°	Yes	17500	0,50
5416341	**VSM11D063Z09S022XD11**	63	22	44	40	11,3	9	1.5°	Yes	17500	0,52
5416342	**VSM11D080Z08S027XD11**	80	27	60	50	11,3	8	1.1°	Yes	15300	1,14
5416345	**VSM11D100Z09S032XD11**	100	32	80	50	11,3	9	0.9°	Yes	13600	1,79
5416347	**VSM11D125Z011S040XD11**	125	40	80	63	11,3	11	0.7°	Yes	12100	3,01

Spare Parts

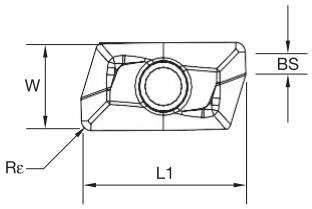
D1	 insert screw	 Nm	 wrench	 socket-head cap screw	 socket-head cap screw with coolant groove	 coolant lock screw assembly
40,0	**192.432**	1,0	**170.028**	**MS1294**	**MS1294CG**	–
50,0	**192.432**	1,0	**170.028**	**12146120500**	**MS1234CG**	–
63,0	**192.432**	1,0	**170.028**	**12146120500**	**MS1234CG**	–
80,0	**192.432**	1,0	**170.028**	**125.230**	**MS2038CG**	–
100,0	**192.432**	1,0	**170.028**	–	–	**MS2195C**
125,0	**192.432**	1,0	**170.028**	–	–	**MS2187C**

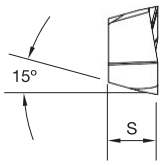
NOTE: Socket-head cap screw and coolant lock screw assembly must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	.E..ML	WP40PM	**.E..MM**	**WP40PM**	.S..MH	WP40PM
P3–P4	.E..ML	WP35CM	**.E..MM**	**WP35CM**	.S..MH	WP35CM
P5–P6	.E..MM	WP25PM	**.S..MH**	**WP35CM**	.S..MH	WP35CM
M1–M2	.E..ML	WU35PM	**.E..MM**	**WU35PM**	.S..MH	WU35PM
M3	.E..ML	WU35PM	**.E..MM**	**WU35PM**	.S..MH	WU35PM
K1–K2	.E..ML	WK15CM	**.E..MM**	**WK15CM**	.S..MH	WK15CM
K3	.E..ML	WP25PM	**.E..MM**	**WP25PM**	.S..MH	WP25PM
N1–N2	.F..ALP	WN25PM	**.F..ALP**	**WN25PM**	.E..ML	WP25PM
N3	.F..ALP	WN25PM	**.F..ALP**	**WN25PM**	.E..ML	WP25PM
S1–S2	.E..ML	WP25PM	**.E..MM**	**WU35PM**	.S..MH	WU35PM
S3	.E..ML	WP25PM	**.E..MM**	**WU35PM**	.S..MH	WU35PM
S4	.E..MM	WU35PM	**.S..MH**	**WU35PM**	–	–
H1	.E..MM	WP25PM	**.E..MM**	**WP25PM**	–	–


XDCT-ML





- -ML is a light- to medium-machining geometry and is the first choice for stainless steel and titanium materials.

● first choice
○ alternate choice

WIDIA VICTORY

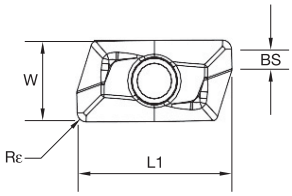
	WDN10U	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WU35PM
P				○	●	●		●
M				●	○	●		●
K		●		○	○			
N	●		●					
S				●		○	●	●
H								

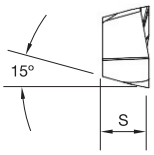
XDCT-ML

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WDN10U	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WU35PM
XDCT110404PDERML	2	13,43	2,09	4,00	6,90	0,40	0,04	-	-	-	5536671	5536670	5642230	-	-
XDCT110408PDERML	2	13,44	1,69	4,00	6,90	0,80	0,04	-	5415549	-	5415548	5415547	5545065	5517826	5415546


XDPT-MM


XDPT-MH





● first choice
○ alternate choice

WIDIA VICTORY

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

- -MM is a medium- to heavy-machining geometry and is the first choice for general purpose and universal applications.

XDPT-MM

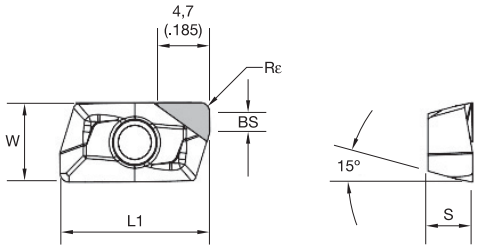
catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WDN10U	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WU35PM
XDPT110404PDSRMM	2	13,43	2,06	4,00	6,90	0,40	0,06	-	5415428	-	5642237	5415450	5642231	-	-
XDPT110408PDSRMM	2	13,44	1,68	4,00	6,90	0,79	0,06	-	5415315	-	5415319	5415318	5545063	5519921	5415317
XDPT110412PDSRMM	2	13,44	1,29	4,00	6,90	1,20	0,06	-	5415310	-	5415314	5415313	5642232	-	5415312
XDPT110416PDSRMM	2	13,51	0,85	4,13	6,95	1,60	0,06	-	5415250	-	5415254	5415253	5642233	-	-
XDPT110420PDSRMM	2	13,51	0,45	4,13	6,95	2,00	0,06	-	-	-	5980399	5980400	5980398	-	-
XDPT110424PDSRMM	2	13,37	–	4,01	6,94	2,40	0,06	-	-	-	5901355	-	5901354	-	-
XDPT110431PDSRMM	2	12,91	–	4,00	6,89	3,10	0,06	-	5415422	-	5415426	5415425	5642234	5517827	-

- -MH is a heavy-duty machining geometry and is the first choice for steel and cast iron materials.

XDPT-MH

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WDN10U	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WU35PM
XDPT110408PDSRMH	2	13,44	1,68	4,00	6,90	0,79	0,13	-	5415255	-	-	5415257	5545064	-	5415256
XDPT110412PDSRMH	2	13,44	1,29	4,00	6,90	1,20	0,13	-	5415360	-	-	5415362	5642235	-	-
XDPT110416PDSRMH	2	13,44	0,90	4,00	6,90	1,59	0,13	-	5415364	-	-	5415366	5642236	-	-


XDCW-PCD



WIDIA VICTORY

P		
M		
K		
N		●
S		
H		

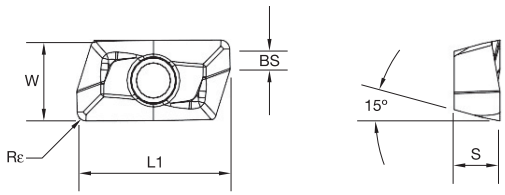
● first choice
○ alternate choice

- -PCD is the first choice for roughing and finishing of abrasive non-ferrous materials and aluminium alloys.

XDCW-PCD

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WDN10U
XDCW110404PDFRPCD	1	13,43	2,10	4,00	6,90	0,40	0,02	5415420
XDCW110408PDFRPCD	1	13,44	1,70	4,00	6,90	0,80	0,02	5415421


XDCT-ALP



WIDIA VICTORY

P		
M		
K		
N	●	●
S		
H		

● first choice
○ alternate choice

- -ALP is the first choice for roughing and finishing of aluminium alloys.

XDCT-ALP

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WN10HM	WN25PM
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	–	6055634	6055635
XDCT110416PDFRALP	2	13,44	0,88	4,00	6,89	1,60	–	6055598	6055599
XDCT110424PDFRALP	2	13,44	0,16	4,00	6,88	2,40	–	6055600	6055631
XDCT110432PDFRALP	2	12,86	–	4,00	6,89	3,20	–	6055632	6055633

Recommended Starting Speeds [m/min]

Material Group		WP25PM			WU35PM			WP40PM			WK15CM		
P	1	330	**285**	270	260	**230**	215	300	**260**	250	–	**–**	–
	2	275	**240**	200	220	**190**	160	250	**220**	180	–	**–**	–
	3	255	**215**	175	200	**170**	140	230	**200**	160	–	**–**	–
	4	225	**185**	150	180	**150**	120	210	**170**	140	–	**–**	–
	5	185	**170**	150	150	**135**	120	170	**160**	140	–	**–**	–
	6	165	**125**	100	130	**100**	80	150	**120**	90	–	**–**	–
M	1	205	**180**	165	170	**150**	135	200	**170**	160	–	**–**	–
	2	185	**160**	130	155	**130**	110	180	**150**	130	–	**–**	–
	3	140	**120**	95	115	**100**	80	130	**120**	90	–	**–**	–
K	1	230	**205**	185	–	**–**	–	–	**–**	–	420	**385**	340
	2	180	**160**	150	–	**–**	–	–	**–**	–	335	**295**	275
	3	150	**135**	120	–	**–**	–	–	**–**	–	280	**250**	230
N	1–2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	40	**35**	25	35	**30**	25	40	**40**	30	–	**–**	–
	2	40	**35**	25	35	**30**	25	40	**40**	30	–	**–**	–
	3	50	**40**	25	45	**35**	25	50	**40**	30	–	**–**	–
	4	70	**50**	35	60	**45**	30	70	**50**	40	–	**–**	–
H	1	120	**90**	70	–	**–**	–	–	**–**	–	–	**–**	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WS30PM			WP35CM			WN25PM			WDN10U		
P	1	–	–	–	455	**395**	370	–	–	–	–	–	–
	2	–	–	–	280	**255**	230	–	–	–	–	–	–
	3	–	–	–	255	**230**	205	–	–	–	–	–	–
	4	–	–	–	190	**175**	160	–	–	–	–	–	–
	5	–	–	–	260	**230**	210	–	–	–	–	–	–
	6	–	–	–	160	**135**	110	–	–	–	–	–	–
M	1	225	**200**	185	205	**185**	155	–	–	–	–	–	–
	2	205	**180**	145	185	**160**	140	–	–	–	–	–	–
	3	155	**135**	105	145	**130**	115	–	–	–	–	–	–
K	1	–	–	–	295	**265**	240	–	–	–	–	–	–
	2	–	–	–	235	**210**	190	–	–	–	–	–	–
	3	–	–	–	195	**175**	160	–	–	–	–	–	–
N	1–2	–	–	–	–	–	–	1075	**945**	875	2755	**2450**	2255
	3	–	–	–	–	–	–	945	**875**	760	2285	**1670**	1355
S	1	45	**40**	30	–	–	–	–	–	–	–	–	–
	2	45	**40**	30	–	–	–	–	–	–	–	–	–
	3	55	**45**	30	–	–	–	–	–	–	–	–	–
	4	85	**60**	40	66	**50**	33	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–

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

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%			
.F..-PCD	0,08	**0,17**	0,23	0,06	**0,13**	0,18	0,06	**0,11**	0,15	0,05	**0,10**	0,14	0,05	**0,10**	0,14	.F..-PCD
.F..ALP	0,08	**0,10**	0,16	0,06	**0,07**	0,12	0,06	**0,06**	0,10	0,05	**0,06**	0,10	0,05	**0,06**	0,10	.F..ALP
.E..ML	0,09	**0,18**	0,30	0,07	**0,14**	0,23	0,06	**0,12**	0,20	0,05	**0,11**	0,19	0,05	**0,11**	0,18	.E..ML
.S..MM	0,17	**0,20**	0,34	0,13	**0,15**	0,25	0,11	**0,13**	0,22	0,10	**0,12**	0,21	0,10	**0,12**	0,20	.S..MM
.S..MH	0,17	**0,25**	0,40	0,13	**0,19**	0,30	0,11	**0,17**	0,26	0,10	**0,15**	0,24	0,10	**0,15**	0,24	.S..MH

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

Achieve True 90° Shoulder Milling with the New High-Performance WIDIA™ VSM11™ Starter Kits.

Victory™ Shoulder Mill 11™ Starter Kits

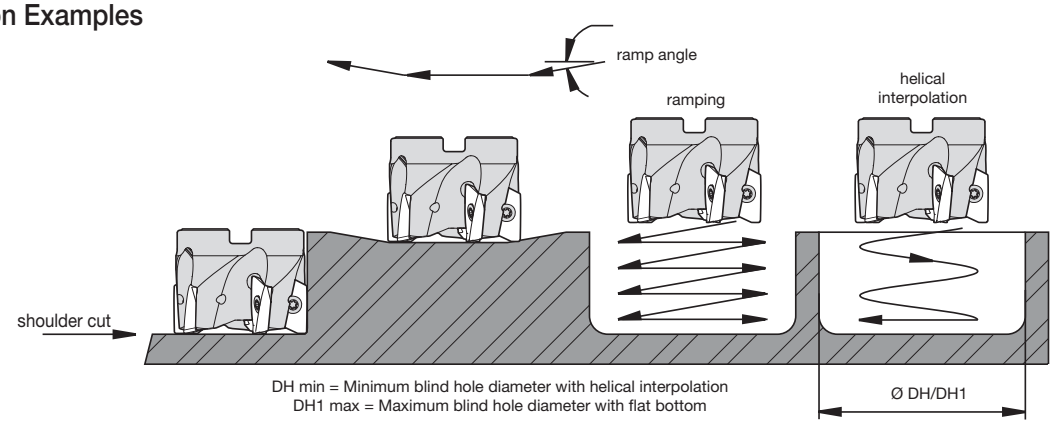
Order one of our starter kits and test the performance of our new VSM11 platform. The kits are set up to serve the majority of shoulder milling applications, delivered with a cutter body and the latest WIDIA Victory™ grades. Detailed order information can be found in the table below.

VSM11 Starter Kits • Metric

order number	catalogue number	diameter D1 (mm)	cutter body type	material group	content				
					cutter	qty	inserts	grade	Z (pocket seats)
5527101	VSM11KITWD016Z02WP40PM	16	Weldon	P	VSM11D016Z02B16XD11	10	XDPT110408PDSRMM	WP40PM	2
5527102	VSM11KITWD020Z03WP40PM	20	Weldon	P	VSM11D020Z03B20XD11	10	XDPT110408PDSRMM	WP40PM	3
5527106	VSM11KITSD050Z05WP40PM	50	Shell	P	VSM11D050Z05S022XD11	10	XDPT110408PDSRMM	WP40PM	5
5719051	VSM11KITSD040Z06WP40PM	40	Shell	P	VSM11D040Z06S016XD11	10	XDPT110408PDSRMM	WP40PM	6
5719052	VSM11KITCD016Z02WP40PM	16	Cylindrical	P	VSM11D016Z02A16XD11L100	10	XDPT110408PDSRMM	WP40PM	2
5719053	VSM11KITCD020Z03WP40PM	20	Cylindrical	P	VSM11D020Z03A20XD11L110	10	XDPT110408PDSRMM	WP40PM	3
5719054	VSM11KITCD025Z04WP40PM	25	Cylindrical	P	VSM11D025Z04A25XD11L120	10	XDPT110408PDSRMM	WP40PM	4
5719055	VSM11KITCD032Z03WP40PM	32	Cylindrical	P	VSM11D032Z03A32XD11L130	10	XDPT110408PDSRMM	WP40PM	3
5886219	VSM11KITCD025Z03L120WP40PM	25	Cylindrical	P	VSM11D025Z03A25XD11L120	10	XDPT110408PDSRMM	WP40PM	3
5886220*	VSM11KITCD025Z03L210WP40PM	25	Cylindrical	P	VSM11D025Z03A25XD11L210	10	XDPT110408PDSRMM	WP40PM	3
5886251*	VSM11KITCD032Z03L250WP40PM	32	Cylindrical	P	VSM11D032Z03A32XD11L250	10	XDPT110408PDSRMM	WP40PM	3

**Starter Kit to be delivered in regular WIDIA™ corrugated box.*

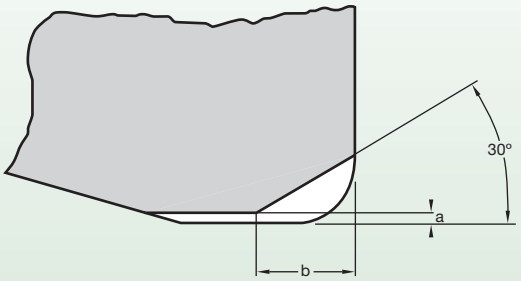
Application Examples



order number	catalogue number	number of inserts	max RPM	max ramp angle to steel body interference	max flat-bottom hole diameter (DH1 max)	min hole diameter (DH min)
5417011	VSM11D016Z02M08XD11	2	41400	10.00°	32,00	19,00
5417013	VSM11D020Z03M10XD11	3	35100	7.80°	40,00	27,00
5417015	VSM11D025Z04M12XD11	4	30200	5.30°	50,00	37,00
5417017	VSM11D032Z04M16XD11	4	25800	3.60°	64,00	51,00
5417019	VSM11D040Z06M16XD11	6	22600	2.60°	80,00	67,00
5416454	VSM11D012Z01B16XD11	1	53100	3.70°	24,00	11,00
5416455	VSM11D016Z02B16XD11	2	41400	10.00°	32,00	19,00
5416457	VSM11D020Z02B20XD11	2	35100	7.80°	40,00	27,00
5416458	VSM11D020Z03B20XD11	3	35100	7.80°	40,00	27,00
5416459	VSM11D025Z03B25XD11	3	30200	5.30°	50,00	37,00
5416480	VSM11D025Z04B25XD11	4	30200	5.30°	50,00	37,00
5416481	VSM11D030Z04B25XD11	4	26900	3.20°	60,00	47,00
5416482	VSM11D032Z04B32XD11	4	25800	3.60°	64,00	51,00
5416483	VSM11D032Z05B32XD11	5	25800	3.60°	64,00	51,00
5416632	VSM11D012Z01A16XD11L100	1	53100	4.00°	24,00	11,00
5416633	VSM11D016Z02A16XD11L100	2	41400	10.00°	32,00	19,00
5416634	VSM11D020Z02A20XD11L110	2	35100	8.00°	40,00	27,00
5416635	VSM11D020Z03A20XD11L110	3	35100	8.00°	40,00	27,00
5416637	VSM11D025Z04A25XD11L120	4	30200	5.00°	50,00	37,00
5416636	VSM11D025Z03A25XD11L120	3	30200	5.00°	50,00	37,00
5416638	VSM11D032Z03A32XD11L130	3	25800	4.00°	64,00	51,00
5416639	VSM11D032Z05A32XD11L130	5	25800	4.00°	64,00	51,00
5416700	VSM11D016Z02A16XD11L170	2	41400	10.00°	32,00	19,00
5416701	VSM11D018Z02A16XD11L170	2	37900	10.00°	36,00	23,00
5416703	VSM11D020Z03A20XD11L170	3	35100	8.00°	40,00	27,00
5416702	VSM11D020Z02A20XD11L170	2	35100	8.00°	40,00	27,00
5416704	VSM11D022Z03A20XD11L170	3	32900	7.00°	44,00	31,00
5416705	VSM11D025Z03A25XD11L210	3	30200	5.00°	50,00	37,00
5416706	VSM11D025Z04A25XD11L210	4	30200	5.00°	50,00	37,00
5416707	VSM11D032Z03A32XD11L250	3	25800	4.00°	64,00	51,00
5416316	VSM11D040Z04S016XD11	4	22600	3.00°	80,00	67,00
5416317	VSM11D040Z06S016XD11	6	22600	3.00°	80,00	67,00
5416318	VSM11D050Z05S022XD11	5	19900	2.00°	100,00	87,00
5416319	VSM11D050Z08S022XD11	8	19900	2.00°	100,00	87,00
5416340	VSM11D063Z06S022XD11	6	17500	2.00°	126,00	113,00
5416341	VSM11D063Z09S022XD11	9	17500	2.00°	126,00	113,00
5416342	VSM11D080Z08S027XD11	8	15300	1.00°	160,00	147,00
5416345	VSM11D100Z09S032XD11	9	13600	0.90°	200,00	187,00
5416347	VSM11D125Z011S040XD11	11	12100	0.70°	250,00	237,00

NOTE: For DH1 max, subtract the insert corner radius from the max hole diameter.

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



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

Engineered to Achieve Superior Surface Quality

EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

Victory™ Shoulder Mill Series

The Victory Shoulder Mill (VSM) family of tools provides a comprehensive solution for your most challenging shoulder milling applications. The unique design of the VSM11™, VSM17™, and VSM490™ is capable of producing a true 90° wall in multiple material types. When combined with the latest WIDIA™ Victory™ grades, VSM from WIDIA provides superior performance at high speeds.

- Innovative cutting geometry provides superior wall and surface finish.
- State-of-the-art step-down capability.
- Real soft cutting action results in lower cutting forces and low machine power consumption.
- VSM11 and VSM17 offer aggressive ramping capabilities.
- VSM490 provides outstanding step-down capabilities in applications that require multiple passes.

To learn more about the benefits of the **WIDIA™ Victory Shoulder Mill Series**, contact your local distributor.

WIDIA™

VSM17

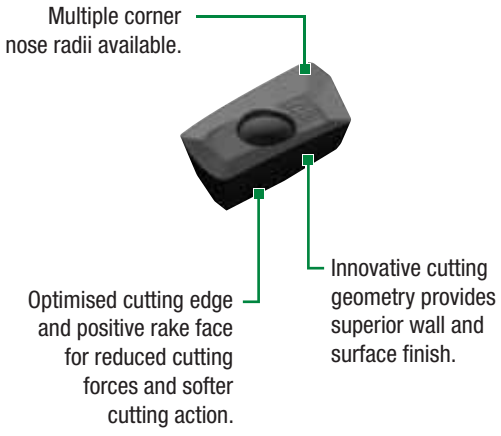
WIDIA Victory Shoulder Mill 17 is a high-performance, versatile, robust, 90° square shoulder milling platform. VSM17 is designed for versatility, low horsepower consumption, and easy cutting action. Cutters can be used for shoulder milling, profiling, face milling, slotting, ramping, helical interpolation, and circular interpolation milling applications. Inserts are specially designed with innovative geometries and features like variable rake angles, negative T-land, small hone, and the latest Victory grades enhancing tool performance and versatility.

Take advantage of the high-performance, advanced carbide substrates, coatings, and surface treatment technologies of the available 7 Victory grades, 4 geometries, and a broad-range cutter body product portfolio. This platform works with multiple material types and applications.

- Up to 16,33mm (.65") depth-of-cut capabilities.
- State-of-the-art step down capability.
- Screw-on, end mill, and shell mill cutters with effective internal coolant supply.

Features

- Insert geometries and grades for all workpiece materials.
- Insert corner radius from 0,4–4mm (.015–.157").
- Max axial depth of cut 16,3mm (0.65").



Benefits

- Achieve true 90° wall finish.
- High performance and longer tool life.
- Latest WIDIA Victory milling grades for all workpiece materials.
- High positive geometry, soft cutting action, reduced cycle times, and low horsepower consumption.
- Stability and reliability.

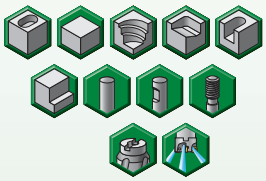
90° Shoulder Mills

VSM17™

Max depth of cut: 16,33mm

Lead angle: 90°
Indexes per insert: 2
Diameter: 25–160mm

Pages: J20–J29



Insert Offering

XDPT-MM

P M K S H

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

XDPT-MH

P M K S

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

XDCT-ALP

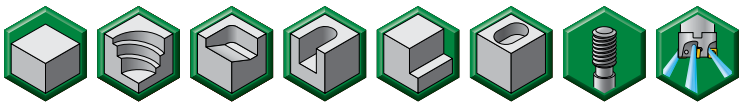
N

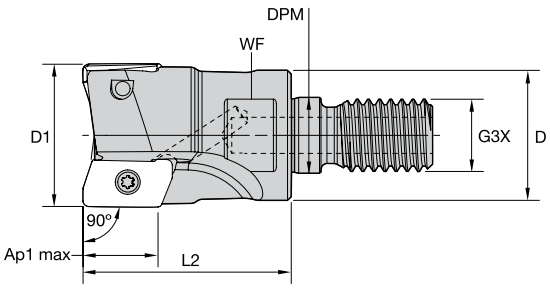
Roughing and finishing
of aluminium alloys.
High precision.
Periphery ground.

XDCT-ML

P M S H

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





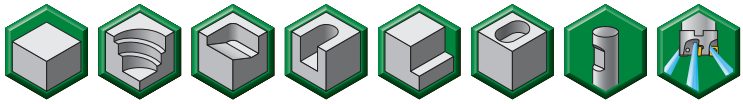
Screw-On End Mills

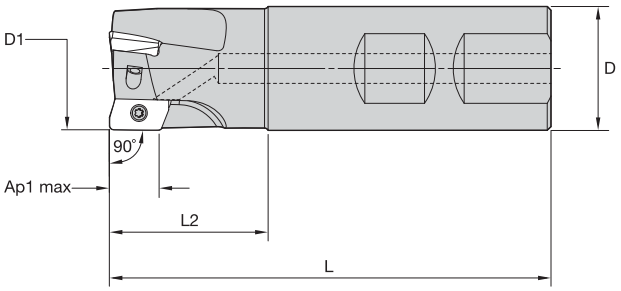
order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5988091	**VSM17D025Z02M12XD17**	25	21	12,5	M12	35	17	16,3	2	8.8	Yes	41800	0,08
5988132	**VSM17D32Z02M016XD17**	32	29	17,0	M16	40	24	16,3	2	5.7	Yes	34700	0,18
5988092	**VSM17D032Z03M16XD17**	32	29	17,0	M16	40	24	16,3	3	5.7	Yes	34700	0,17
5988131	**VSM17D40Z03M016XD17**	40	29	17,0	M16	40	24	16,2	3	4.0	Yes	29800	0,20
5988093	**VSM17D040Z04M16XD17**	40	29	17,0	M16	40	24	16,2	4	4.0	Yes	29800	0,20

Spare Parts

		
insert screw	**Nm**	**wrench**
191.725	3,5	**170.025**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.





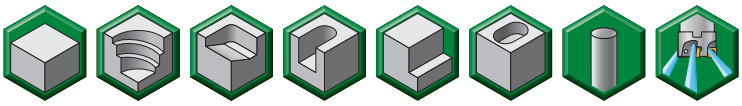
Weldon Shanks

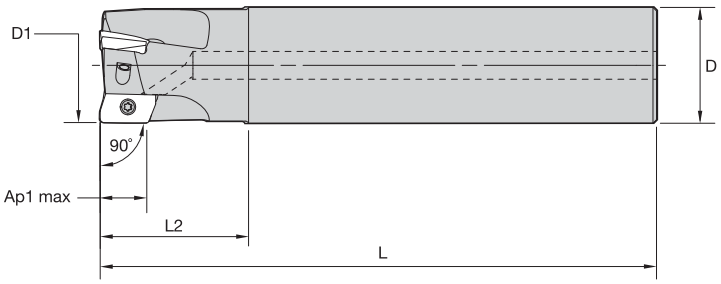
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5988102	**VSM17D025Z02B25XD17**	25	25	90	33	16,3	2	8.8	Yes	41800	0,26
5988136	**VSM17D032Z02B32XD17**	32	32	100	39	16,3	2	5.7	Yes	34700	0,49
5988103	**VSM17D032Z03B32XD17**	32	32	100	39	16,3	3	5.7	Yes	34700	0,48
5988137	**VSM17D040Z03B40XD17**	40	40	110	39	16,2	3	4.0	Yes	29800	0,88
5988104	**VSM17D040Z04B40XD17**	40	40	110	39	16,2	4	4.0	Yes	29800	0,87

Spare Parts

		
insert screw	**Nm**	**wrench**
191.725	3,5	**170.025**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.





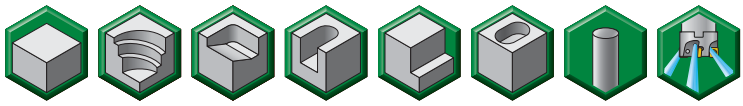
Cylindrical End Mills

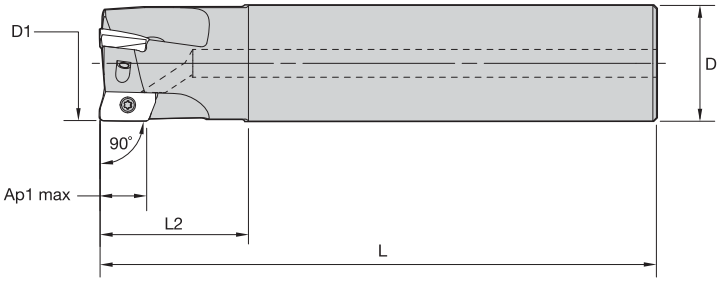
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5988055	**VSM17D025Z02A25XD17L110**	25	25	110	44	16,3	2	8.8	Yes	41800	0,32
5988056	**VSM17D025Z02A25XD17L170**	25	25	170	44	16,3	2	8.8	Yes	41800	0,54
5988107	**VSM17D032Z02A32XD17L120**	32	32	120	50	16,3	2	5.7	Yes	34700	0,60
5988057	**VSM17D032Z03A32XD17L120**	32	32	120	50	16,3	3	5.7	Yes	34700	0,60
5988109	**VSM17D040Z03A32XD17L130**	40	32	130	50	16,2	3	4.0	Yes	29800	0,77
5988059	**VSM17D040Z04A32XD17L130**	40	32	130	50	16,2	4	4.0	Yes	29800	0,77

Spare Parts

insert screw	Nm	wrench
191.725	3,5	**170.025**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.





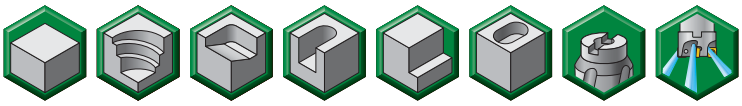
Cylindrical End Mills • Long Shank

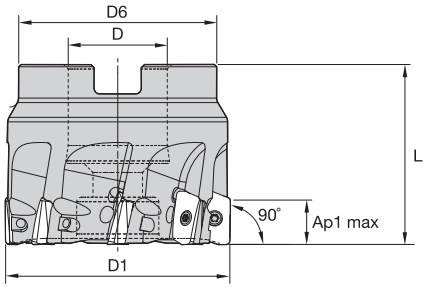
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5988108	**VSM17D032Z02A32XD17L210**	32	32	210	50	16,3	2	5.7	Yes	34700	1,14
5988058	**VSM17D032Z03A32XD17L210**	32	32	210	50	16,3	3	5.7	Yes	34700	1,13
5988110	**VSM17D040Z03A32XD17L250**	40	32	250	50	16,2	3	4.0	Yes	29800	1,49
5988060	**VSM17D040Z04A32XD17L250**	40	32	250	50	16,2	4	4.0	Yes	29800	1,49

Spare Parts

insert screw	Nm	wrench
191.725	3,5	**170.025**

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.





Shell Mills

order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	coolant supply	max RPM	kg
5988094	**VSM17D040Z04S16XD17**	40	16	37	40	16,2	4	4.0	Yes	29800	0,19
5988095	**VSM17D050Z04S22XD17**	50	22	45	40	16,1	4	3.0	Yes	25800	0,28
5988096	**VSM17D050Z05S22XD17**	50	22	45	40	16,1	5	3.0	Yes	25800	0,29
5988134	**VSM17D050Z06S22XD17**	50	22	45	40	16,1	6	3.0	Yes	25800	0,28
5988097	**VSM17D063Z05S22XD17**	63	22	50	40	16,0	5	2.1	Yes	22400	0,45
5988135	**VSM17D063Z06S22XD17**	63	22	50	40	16,0	6	2.1	Yes	22400	0,45
5988098	**VSM17D080Z06S27XD17**	80	27	60	50	15,9	6	1.6	Yes	19500	0,98
5988133	**VSM17D080Z07S27XD17**	80	27	60	50	15,9	7	1.6	Yes	19500	0,96
5988099	**VSM17D100Z08S32XD17**	100	32	80	50	15,8	8	1.2	Yes	17200	1,63
5988100	**VSM17D125Z09S40XD17**	125	40	90	63	15,7	9	0.9	Yes	15200	2,94
5988101	**VSM17D160Z12S40XD17**	160	40	100	63	15,6	12	0.7	Yes	13300	3,66

Spare Parts

D1	insert screw	Nm	wrench	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw assembly	coolant lock screw	coolant cap
40,0	**191.725**	3,5	**170.025**	**MS1294**	**MS1294CG**	–	–	–
50,0	**191.725**	3,5	**170.025**	**MS1234**	**MS1294CG**	–	–	–
50,0	**191.725**	3,5	**170.025**	**MS1234**	**MS1234CG**	–	–	–
63,0	**191.725**	3,5	**170.025**	**MS1234**	**MS1234CG**	–	–	–
80,0	**191.725**	3,5	**170.025**	**MS2038**	**MS2038CG**	–	–	–
100,0	**191.725**	3,5	**170.025**	–	–	**MS2195C**	–	–
125,0	**191.725**	3,5	**170.025**	–	–	**MS2187C**	–	–
160,0	**191.725**	3,5	**170.025**	–	–	–	**12146107000**	**12146111100**

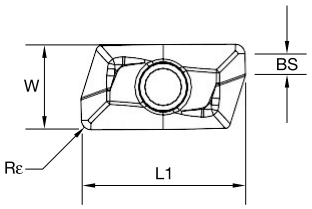
NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page J16.

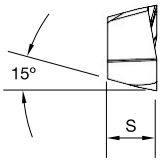
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	.E..ML	WP40PM	**.S..MM**	**WP40PM**	.S..MH	WP40PM
P3–P4	.E..ML	WP35CM	**.S..MM**	**WP35CM**	.S..MH	WP35CM
P5–P6	.E..ML	WP35CM	**.S..MM**	**WU35PM**	.S..MH	WP35CM
M1–M2	.E..ML	WP25PM	**.S..MM**	**WP25PM**	.S..MM	WU35PM
M3	.E..ML	WP35CM	**.S..MM**	**WP35CM**	.S..MH	WP35CM
K1–K2	.S..MM	WK15CM	**.S..MM**	**WK15CM**	.S..MH	WK15CM
K3	.E..ML	WP35CM	**.S..MM**	**WP35CM**	.S..MH	WP35CM
N1–N2	.F..ALP	WN10HM	**.F..ALP**	**WN25PM**	.F..ALP	WN25PM
N3	–	–	**–**	**–**	–	–
S1–S2	.S..MM	WP25PM	**.S..MM**	**WU35PM**	.S..MM	WU35PM
S3	.S..MM	WU35PM	**.S..MM**	**WU35PM**	.S..MM	WU35PM
S4	.S..MM	WP25PM	**.S..MM**	**WU35PM**	.S..MM	WU35PM
H1	.S..MM	WP25PM	**.S..MM**	**WP25PM**	–	–

WIDIA VICTORY


XDCT-ML





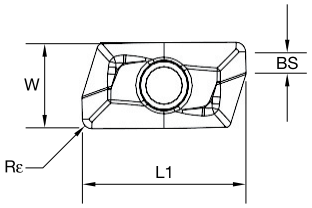
● first choice
○ alternate choice

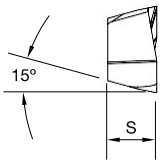
P			○	●	●	●	
M			●	○	●	●	
K	●		○	○			
N		●					
S			●		○	●	
H			●	○			

XDCT-ML

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WU35PM
XDCT170404PEERML	2	19,15	2,62	4,90	9,60	0,40	0,04	'	'	5989010	'	'	'
XDCT170408PEERML	2	19,15	2,22	4,90	9,60	0,80	0,04	'	'	5988983	5988982	5988981	'
XDCT170412PEERML	2	19,16	1,82	4,90	9,60	1,20	0,04	'	'	5988988	5988987	5988986	'
XDCT170416PEERML	2	19,17	1,42	4,90	9,60	1,60	0,04	'	'	6001257	'	'	'
XDCT170420PEERML	2	19,17	1,01	4,90	9,60	2,00	0,04	'	'	6001255	'	'	'
XDCT170424PEERML	2	19,17	0,63	4,90	9,60	2,40	0,04	'	'	6001253	'	'	'
XDCT170432PEERML	2	18,85	–	4,88	9,59	3,20	0,04	'	'	6001251	'	'	'
XDCT170440PEERML	2	18,33	–	4,87	9,59	4,00	0,04	'	'	6001239	'	'	'


XDCT-ALP





● first choice
○ alternate choice

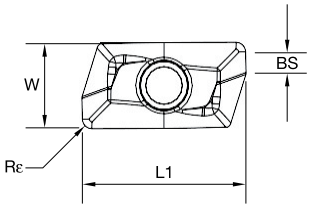
P			
M			
K			
N		●	●
S			
H			

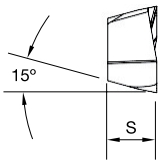
XDCT-ALP

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WN10HM	WN25PM
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


XDPT-MM


XDPT-MH





● first choice
○ alternate choice

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

XDPT-MM

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	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	-	5987949	5987947	5987946	5987950
XDPT170412PESRMM	2	19,16	1,77	4,90	9,60	1,20	0,10	5988138	-	5988151	5988140	5988139	5988152
XDPT170416PESRMM	2	19,17	1,38	4,90	9,60	1,60	0,10	5988153	-	5988155	5988156	5988154	-
XDPT170420PESRMM	2	19,17	0,99	4,90	9,60	2,00	0,10	-	-	5988158	5988160	5988159	-
XDPT170424PESRMM	2	19,17	0,62	4,90	9,60	2,40	0,10	-	-	5988203	-	5988202	-
XDPT170432PESRMM	2	18,85	–	4,89	9,59	3,20	0,10	-	-	5988206	5988204	5988205	-
XDPT170440PESRMM	2	18,33	–	4,87	9,59	4,00	0,10	-	-	5988970	-	5988969	-

XDPT-MH

catalogue number	cutting edges	L1	BS	S	W	Rε	hm	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WU35PM
XDPT170408PESRMH	2	19,15	2,10	4,91	9,60	0,80	0,13	5989053	-	-	5989054	5989052	-
XDPT170412PESRMH	2	19,16	1,73	4,91	9,60	1,20	0,13	5991817	-	-	5991816	5991815	-

Recommended Starting Speeds [m/min]

Material Group		WK15CM			WN25PM			WP25PM			WP35CM			WP40PM			WN10HM			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	–	**–**	–	150	**135**	120
	6	–	**–**	–	–	**–**	–	165	**125**	100	160	**135**	110	150	**115**	90	–	**–**	–	130	**100**	80
M	1	–	**–**	–	–	**–**	–	205	**180**	165	205	**185**	155	195	**170**	155	–	**–**	–	170	**150**	135
	2	–	**–**	–	–	**–**	–	185	**160**	130	185	**160**	140	175	**150**	125	–	**–**	–	155	**130**	110
	3	–	**–**	–	–	**–**	–	140	**120**	95	145	**130**	115	130	**115**	90	–	**–**	–	115	**100**	80
K	1	420	**385**	340	–	**–**	–	230	**205**	185	295	**265**	240	–	**–**	–	190	**170**	150	–	**–**	–
	2	335	**295**	275	–	**–**	–	180	**160**	150	235	**210**	190	–	**–**	–	–	**–**	–	–	**–**	–
	3	280	**250**	230	–	**–**	–	150	**135**	120	195	**175**	160	–	**–**	–	–	**–**	–	–	**–**	–
N	1	–	**–**	–	1075	**945**	875	–	**–**	–	–	**–**	–	–	**–**	–	2000	**1200**	1000	–	**–**	–
	2	–	**–**	–	945	**875**	760	–	**–**	–	–	**–**	–	–	**–**	–	1365	**815**	665	–	**–**	–
	3	–	**–**	–	945	**875**	760	–	**–**	–	–	**–**	–	–	**–**	–	800	**500**	400	–	**–**	–
S	1	–	**–**	–	–	**–**	–	40	**35**	25	–	**–**	–	40	**35**	30	–	**–**	–	35	**30**	25
	2	–	**–**	–	–	**–**	–	40	**35**	25	–	**–**	–	40	**35**	30	–	**–**	–	35	**30**	25
	3	–	**–**	–	–	**–**	–	50	**40**	25	–	**–**	–	50	**40**	30	–	**–**	–	45	**35**	25
	4	–	**–**	–	–	**–**	–	70	**50**	35	66	**50**	33	65	**50**	35	–	**–**	–	60	**45**	30
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.

Recommended Starting Feeds

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**	0,58	0,08	**0,17**	0,42	0,06	**0,13**	0,31	0,06	**0,11**	0,27	0,05	**0,10**	0,25	.F..ALP
.E..ML	0,16	**0,35**	0,70	0,12	**0,25**	0,50	0,09	**0,19**	0,38	0,08	**0,16**	0,33	0,07	**0,15**	0,30	.E..ML
.S..MM	0,16	**0,46**	0,87	0,12	**0,33**	0,63	0,09	**0,25**	0,47	0,08	**0,22**	0,41	0,07	**0,20**	0,38	.S..MM
.S..MH	0,23	**0,58**	0,93	0,17	**0,42**	0,67	0,13	**0,31**	0,50	0,11	**0,27**	0,44	0,10	**0,25**	0,40	.S..MH

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

Order a VSM17™ Kit to achieve true 90° high-performance shoulder milling!

Victory™ Shoulder Mill 17™ Starter Kits

Order one of our starter kits and test the performance of our new VSM17 platform. The kits are set up to serve the majority of shoulder milling applications, delivered with a cutter body and the latest WIDIA™ Victory™ grades. Detailed order information can be found in the table below.

■ VSM17 Starter Kits • Metric

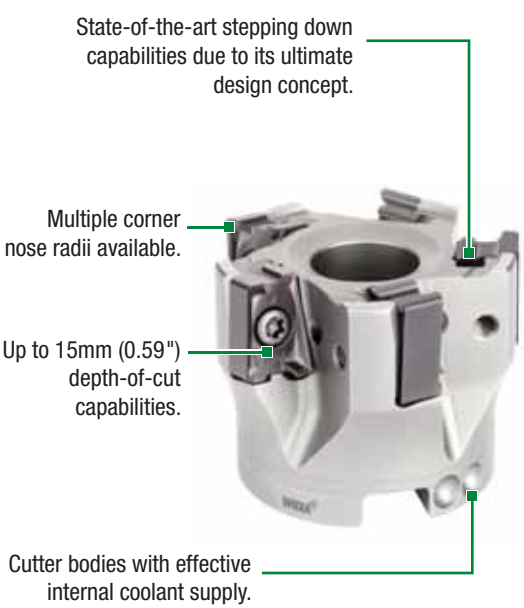
order number	catalogue number	diameter D1 (mm)	cutter body type	material group	content					
					cutter	qty	inserts	qty	grade	Z (Pocket Seats)
6049187	VSM17KITCD025Z2WP40PM	25	CYLINDRICAL	P	VSM17D025Z02A25XD17L110	1	XDPT170408PESRMM	10	WP40PM	2
6049185	VSM17KITSW025Z2WP40PM	25	SCREW ON	P	VSM17D025Z02M12XD17	1	XDPT170408PESRMM	10	WP40PM	2
6049186	VSM17KITWD025Z2WP40PM	25	WELDON	P	VSM17D025Z02B25XD17	1	XDPT170408PESRMM	10	WP40PM	2
6049190	VSM17KITCD032Z3WP40PM	32	CYLINDRICAL	P	VSM17D032Z03A32XD17L120	1	XDPT170408PESRMM	10	WP40PM	3
6049188	VSM17KITSW032Z3WP40PM	32	SCREW ON	P	VSM17D032Z03M16XD17	1	XDPT170408PESRMM	10	WP40PM	3
6049189	VSM17KITWD032Z3WP40PM	32	WELDON	P	VSM17D032Z03B32XD17	1	XDPT170408PESRMM	10	WP40PM	3
6049311	VSM17KITCD032Z2WP40PM	32	CYLINDRICAL	P	VSM17D032Z02A32XD17L120	1	XDPT170408PESRMM	10	WP40PM	2
6049313	VSM17KITCD040Z4WP40PM	40	CYLINDRICAL	P	VSM17D040Z04A32XD17L130	1	XDPT170408PESRMM	10	WP40PM	4
6049312	VSM17KITSD040Z4WP40PM	40	SHELL MILL	P	VSM17D040Z04S16XD17	1	XDPT170408PESRMM	10	WP40PM	4
6049314	VSM17KITSD050Z4WP40PM	50	SHELL MILL	P	VSM17D050Z04S22XD17	1	XDPT170408PESRMM	10	WP40PM	4
6049315	VSM17KITSD050Z5WP40PM	50	SHELL MILL	P	VSM17D050Z05S22XD17	1	XDPT170408PESRMM	10	WP40PM	5
6049316	VSM17KITSD063Z5WP40PM	63	SHELL MILL	P	VSM17D063Z05S22XD17	1	XDPT170408PESRMM	10	WP40PM	5
6049317	VSM17KITSD080Z6WP40PM	80	SHELL MILL	P	VSM17D080Z06S27XD17	1	XDPT170408PESRMM	10	WP40PM	6
6049318	VSM17KITSD100Z8WP40PM	100	SHELL MILL	P	VSM17D100Z08S32XD17	1	XDPT170408PESRMM	10	WP40PM	8
6049321	VSM17KITCD025Z2WK15CM	25	CYLINDRICAL	K	VSM17D025Z02A25XD17L110	1	XDPT170408PESRMM	10	WK15CM	2
6049319	VSM17KITSW025Z2WK15CM	25	SCREW ON	K	VSM17D025Z02M12XD17	1	XDPT170408PESRMM	10	WK15CM	2
6049320	VSM17KITWD025Z2WK15CM	25	WELDON	K	VSM17D025Z02B25XD17	1	XDPT170408PESRMM	10	WK15CM	2
6049324	VSM17KITCD032Z3WK15CM	32	CYLINDRICAL	K	VSM17D032Z03A32XD17L120	1	XDPT170408PESRMM	10	WK15CM	3
6049322	VSM17KITSW032Z3WK15CM	32	SCREW ON	K	VSM17D032Z03M16XD17	1	XDPT170408PESRMM	10	WK15CM	3
6049323	VSM17KITWD032Z3WK15CM	32	WELDON	K	VSM17D032Z03B32XD17	1	XDPT170408PESRMM	10	WK15CM	3
6049325	VSM17KITCD032Z2WK15CM	32	CYLINDRICAL	K	VSM17D032Z02A32XD17L120	1	XDPT170408PESRMM	10	WK15CM	2
6049327	VSM17KITCD040Z4WK15CM	40	CYLINDRICAL	K	VSM17D040Z04A32XD17L130	1	XDPT170408PESRMM	10	WK15CM	4
6049326	VSM17KITSD040Z4WK15CM	40	SHELL MILL	K	VSM17D040Z04S16XD17	1	XDPT170408PESRMM	10	WK15CM	4
6049328	VSM17KITSD050Z4WK15CM	50	SHELL MILL	K	VSM17D050Z04S22XD17	1	XDPT170408PESRMM	10	WK15CM	4
6049329	VSM17KITSD050Z5WK15CM	50	SHELL MILL	K	VSM17D050Z05S22XD17	1	XDPT170408PESRMM	10	WK15CM	5
6049330	VSM17KITSD063Z5WK15CM	63	SHELL MILL	K	VSM17D063Z05S22XD17	1	XDPT170408PESRMM	10	WK15CM	5
6049331	VSM17KITSD080Z6WK15CM	80	SHELL MILL	K	VSM17D080Z06S27XD17	1	XDPT170408PESRMM	10	WK15CM	6
6049332	VSM17KITSD100Z8WK15CM	100	SHELL MILL	K	VSM17D100Z08S32XD17	1	XDPT170408PESRMM	10	WK15CM	8

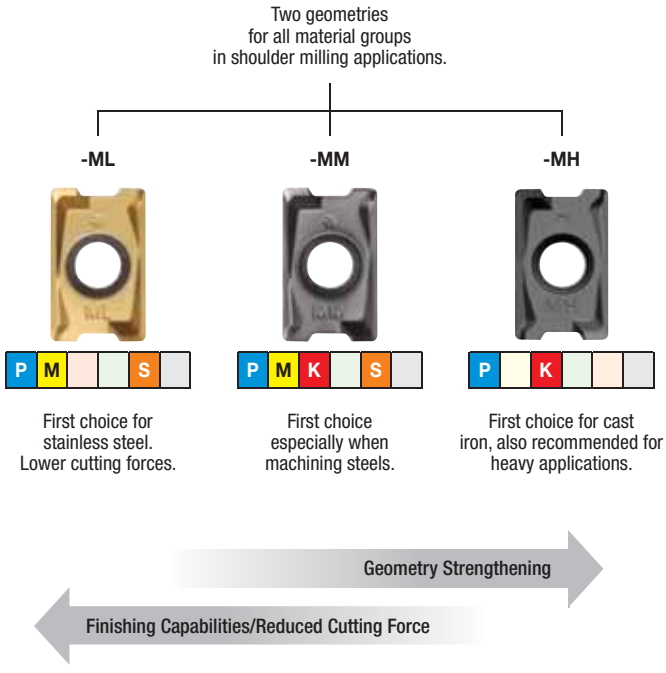
Double-Sided Shoulder Mill •
VSM490™-15

VSM490-15

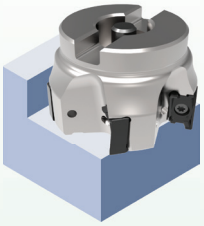
WIDIA™ Victory™ Shoulder Milling Series (VSM series) is specially engineered to achieve excellent surface quality as well as higher material removal rates in shoulder milling applications. The VSM490 series, with its unique design, enables the tool to be applied in multiple passes (stepping down) with outstanding results. VSM490-15 is applicable in a wide range of workpiece materials: steel, cast iron, stainless steel, and titanium, from roughing to finishing applications.

- Double-sided strong insert with 4 cutting edges.
- High positive geometry for lower cutting forces.
- Superior wall and surface finish capabilities.





90° Shoulder Mills

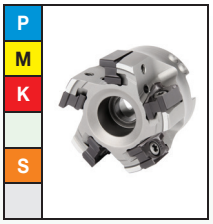


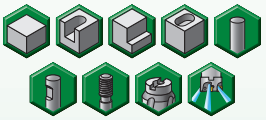
VSM490™-15

Max depth of cut: 15mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 25–160mm

Pages: J32–J40

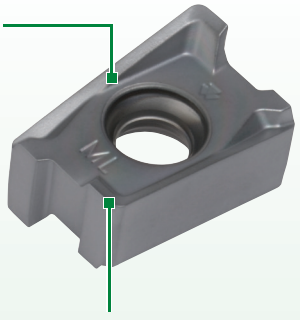




VSM490™-15 • Unbeatable Performance in Shoulder Milling

- "Stepless" solution.
- No mismatch when machining walls in different steps.

Innovative cutting geometry provides superior wall and surface finish.

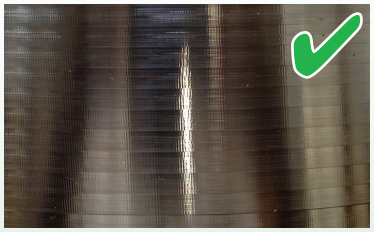


Integrated wiper facet for excellent floor finishing.

Competitor Tool • Wall Quality

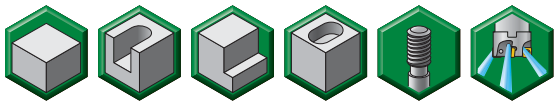
Traditional tools are designed to achieve a 90° wall, but exhibit poor performance when machining walls in multiple passes.

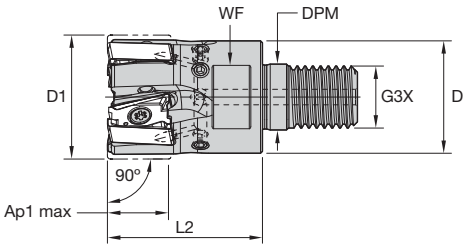
VSM490-15 • Wall Quality



VSM490-15 minimises the marks left. By increasing wall quality and avoiding a second tool, productivity increases significantly.

- Superior wall and surface finish capabilities.
- “Stepless” solution. True 90° to run precise applications in multiple axial passes.
- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.





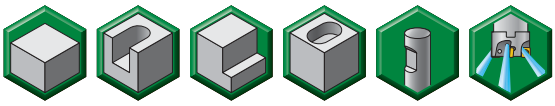
Screw-On End Mills

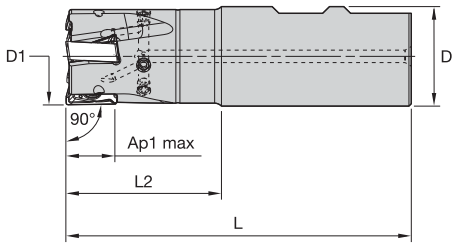
order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	kg	max RPM
5873211	**VSM490D025Z02M12XN15**	25	21	13	M12	32	17	15,0	2	0,18	26700
5873212	**VSM490D032Z03M16XN15**	32	29	17	M16	40	24	15,0	3	0,18	22000
5873213	**VSM490D032Z04M16XN15**	32	29	17	M16	40	24	15,0	4	0,18	22000
5873214	**VSM490D035Z04M16XN15**	35	29	17	M16	40	24	15,0	4	0,19	20600

Spare Parts

insert screw	Nm	Torx Plus driver
MS-2071	3,5	**DT15IP**

- Superior wall and surface finish capabilities.
- “Stepless” solution. True 90° to run precise applications in multiple axial passes.
- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.





Weldon Shanks

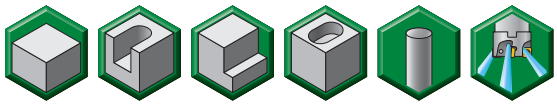
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	kg	max RPM
5710285	**VSM490D025Z02B25XN15**	25	25	89	32	15,0	2	0,28	26700
5710286	**VSM490D032Z03B32XN15**	32	32	111	50	15,0	3	0,58	22000
5873215	**VSM490D040Z03B32XN15**	40	32	111	50	15,0	3	0,65	18800

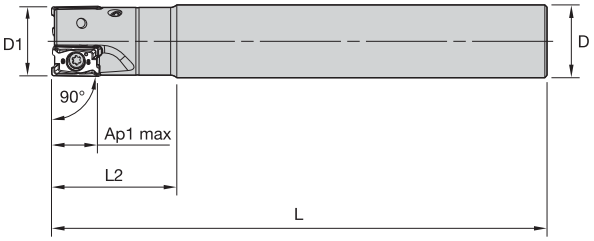
NOTE: Weldon type not recommended for finishing operations.

Spare Parts

insert screw	Nm	Torx Plus driver
MS-2071	3,5	**DT15IP**

- Superior wall and surface finish capabilities.
- “Stepless” solution. True 90° to run precise applications in multiple axial passes.
- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.





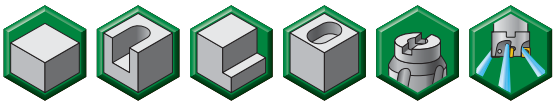
Cylindrical End Mills

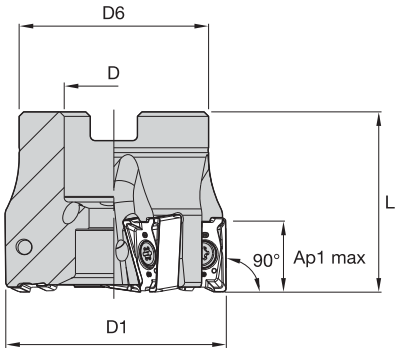
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	kg	max RPM
5873216	**VSM490D025Z02A25XN15L100**	25	25	100	43	15,0	2	0,32	26700
5710287	**VSM490D025Z02A25XN15L170**	25	25	170	43	15,0	2	0,59	26700
5873217	**VSM490D032Z03A32XN15L110**	32	32	110	49	15,0	3	0,59	22000
5710288	**VSM490D032Z03A32XN15L200**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

Spare Parts

 insert screw	 Nm	 Torx Plus driver
MS-2071	3,5	**DT15IP**

- Superior wall and surface finish capabilities.
- “Stepless” solution. True 90° to run precise applications in multiple axial passes.
- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.

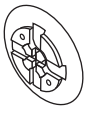




Shell Mills

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

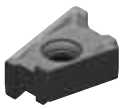
Spare Parts

D1	 insert screw	 Nm	 Torx Plus driver	 socket-head cap screw	 socket-head cap screw with coolant groove	 coolant lock screw assembly	 coolant lock screw	 coolant shower plate
40	MS-2071	3,5	DT15IP	125.825	MS1294CG	–	–	–
50	MS-2071	3,5	DT15IP	125.025	MS1234CG	–	–	–
63	MS-2071	3,5	DT15IP	125.025	MS1234CG	–	–	–
80	MS-2071	3,5	DT15IP	125.230	MS2038CG	–	–	–
100	MS-2071	3,5	DT15IP	–	–	MS2189C	–	–
125	MS-2071	3,5	DT15IP	–	–	MS2187C	–	–
160	MS-2071	3,5	DT15IP	–	–	–	420.200	470.233

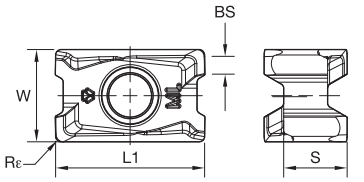
NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	XNGU-ML	WP40PM	**XNPU-ML**	**WP40PM**	XNPU-MM	WP40PM
P3–P4	XNGU-ML	WP25PM	**XNPU-MM**	**WP35CM**	XNPU-MM	WP40PM
P5–P6	XNGU-MM	WP25PM	**XNPU-MM**	**WP35CM**	XNPU-MM	WP35CM
M1–M2	XNGU-ML	WP25PM	**XNGU-ML**	**WU35PM**	XNGU-MM	WU35PM
M3	XNGU-ML	WP25PM	**XNGU-ML**	**WU35PM**	XNGU-MM	WU35PM
K1–K2	XNGU-MH	WK15CM	**XNGU-MH**	**WK15CM**	XNGU-MH	WP35CM
K3	XNGU-MH	WK15PM	**XNGU-MH**	**WK15PM**	XNGU-MH	WP40PM
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	XNGU-ML	WP25PM	**XNGU-ML**	**WU35PM**	XNGU-MM	WU35PM
S3	XNGU-ML	WP25PM	**XNGU-ML**	**WU35PM**	XNGU-MM	WU35PM
S4	XNGU-ML	WU35PM	**XNGU-ML**	**WU35PM**	XNPU-MM	WU35PM
H1	–	–	–	–	–	–


XNGU-ML


XNGU-ML



- -ML geometry is the first choice for machining stainless steel. With reduced cutting forces, this is recommended for improved wall finishing capabilities in steels.

● first choice
○ alternate choice

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

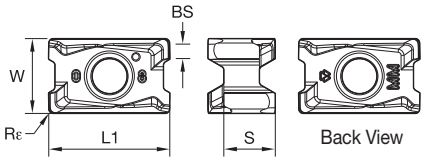
XNGU-ML • Precision Finishing

catalogue number	cutting edges	L1	S	W	BS	Rε	hm	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNGU15T604ERML	4	16,20	6,88	10,00	2,20	0,40	0,08	▪	5890821	5890823	5890822	▪	▪
XNGU15T608ERML	4	16,20	6,88	10,00	1,80	0,80	0,08	▪	5873481	5873483	5873482	▪	▪


XNGU-MM
XNPU-MM


XNGU-ML
XNPU-ML


XNGU-MH



- -ML geometry is the first choice for machining stainless steel. With reduced cutting forces, this is recommended for improved wall finishing capabilities in steels.
- -MM is the universal geometry for VSM490-15. First choice when machining steel, as well as stainless steel and high-temp alloys in heavy applications.
- -MH geometry is the first choice for cast iron machining in the medium and heavy applications.

● first choice
○ alternate choice

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

XNGU-MM • Precision Finishing

catalogue number	cutting edges	L1	S	W	BS	Rε	hm	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNGU15T604SRMM	4	16,20	6,88	10,00	2,20	0,40	0,10	-	5949204	5949206	5949205	-	-
XNGU15T608SRMM	4	16,20	6,88	10,00	1,90	0,80	0,10	-	5710527	5710529	5710528	-	-

XNPU-ML • Utility Roughing

catalogue number	cutting edges	L1	S	W	BS	Rε	hm	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNPU15T608ERML	4	16,10	6,88	10,00	1,90	0,80	0,08	-	5883097	5883099	5883098	-	-

XNPU-MM • Utility Roughing

catalogue number	cutting edges	L1	S	W	BS	Rε	hm	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNPU15T608SRMM	4	16,10	6,88	10,00	1,90	0,80	0,10	5873419	5873415	5873417	5873416	5873420	5873418
XNPU15T612SRMM	4	16,10	6,88	10,00	1,50	1,20	0,10	5890762	5890728	5890730	5890729	5890763	5890761
XNPU15T616SRMM	4	16,10	6,88	10,00	1,10	1,60	0,10	5883521	5883447	5883449	5883448	5883522	5883450

XNGU-MH • Utility Roughing

catalogue number	cutting edges	L1	S	W	BS	Rε	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNGU15T608SRMH	4	16,20	6,88	10,00	1,80	0,80	6003724	6003570	6003722	6003721	6003725	6003723
XNGU15T616SRMH	4	16,20	6,88	10,00	1,00	1,60	6030378	6030376	-	-	6030380	6030377

Recommended Starting Speeds [m/min]

Material Group		WK15PM			WP25PM			WU35PM			WP40PM			WK15CM			WP35CM		
P	1	–	–	–	330	**285**	270	260	**230**	215	300	**260**	250	–	–	–	455	**395**	370
	2	–	–	–	275	**240**	200	220	**190**	160	250	**220**	180	–	–	–	280	**255**	230
	3	–	–	–	255	**215**	175	200	**170**	140	230	**200**	160	–	–	–	255	**230**	205
	4	–	–	–	225	**185**	150	180	**150**	120	210	**170**	140	–	–	–	190	**175**	160
	5	–	–	–	185	**170**	150	150	**135**	120	170	**160**	140	–	–	–	260	**230**	210
	6	–	–	–	165	**125**	100	130	**100**	80	150	**120**	90	–	–	–	160	**135**	110
M	1	–	–	–	205	**180**	165	170	**150**	135	200	**170**	160	–	–	–	205	**185**	155
	2	–	–	–	185	**160**	130	155	**130**	110	180	**150**	130	–	–	–	185	**160**	140
	3	–	–	–	140	**120**	95	115	**100**	80	130	**120**	90	–	–	–	145	**130**	115
K	1	270	**245**	215	230	**205**	185	–	–	–	–	–	–	420	**385**	340	295	**265**	240
	2	210	**190**	175	180	**160**	150	–	–	–	–	–	–	335	**295**	275	235	**210**	190
	3	175	**160**	145	150	**135**	120	–	–	–	–	–	–	280	**250**	230	195	**175**	160
N	1–2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	40	**35**	25	35	**30**	25	40	**40**	30	–	–	–	–	–	–
	2	–	–	–	40	**35**	25	35	**30**	25	40	**40**	30	–	–	–	–	–	–
	3	–	–	–	50	**40**	25	45	**35**	25	50	**40**	30	–	–	–	–	–	–
	4	–	–	–	70	**50**	35	60	**45**	30	70	**50**	40	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

Recommended Starting Feeds

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%			
XN.U-ML	0,17	**0,29**	0,46	0,13	**0,21**	0,33	0,09	**0,16**	0,25	0,08	**0,14**	0,22	0,08	**0,13**	0,20	XN.U-ML
XN.U-MM	0,21	**0,39**	0,58	0,15	**0,28**	0,42	0,11	**0,21**	0,31	0,10	**0,19**	0,27	0,09	**0,17**	0,25	XN.U-MM
XNGU-MH	0,23	**0,45**	0,70	0,17	**0,33**	0,50	0,13	**0,24**	0,38	0,11	**0,21**	0,33	0,10	**0,20**	0,30	XNGU-MH

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

Order a VSM490™ Kit and experience the next level of shoulder milling!

VSM490-15 Starter Kits

Order one of our starter kits and test the performance of our new VSM490-15 platform. The kits are set up to serve the majority of shoulder milling applications and workpiece materials, delivered with a cutter body as well as 20 inserts from a premium WIDIA™ grade. Detailed order information can be found in the table below.

VSM490-15 Starter Kits • Metric

order number	catalogue number	cutter diameter/ flutes	cutter body type	material group	application range	content				
						cutter	qty	inserts	grade	qty
5966234	VSM490KITC-D25Z02WP40PM	25z2	CYLINDRICAL	P	∇∇	VSM490D025Z02A25XN15L170	1	XNPU15T608SRMM	WP40PM	20
5966235	VSM490KITC-D32Z03WP40PM	32z3	CYLINDRICAL	P	∇∇	VSM490D032Z03A32XN15L200	1	XNPU15T608SRMM	WP40PM	20
5966236	VSM490KITS-D40Z04WP40PM	40z4	SHELL MILL	P	∇∇	VSM490D040Z04S16XN15	1	XNPU15T608SRMM	WP40PM	20
5966237	VSM490KITS-D50Z05WP40PM	50z5	SHELL MILL	P	∇∇	VSM490D050Z05S22XN15	1	XNPU15T608SRMM	WP40PM	20
5966238	VSM490KITS-D50Z06WP40PM	50z6	SHELL MILL	P	∇∇	VSM490D050Z06S22XN15	1	XNPU15T608SRMM	WP40PM	20
5966239	VSM490KITS-D63Z06WP40PM	63z6	SHELL MILL	P	∇∇	VSM490D063Z06S22XN15	1	XNPU15T608SRMM	WP40PM	20
5966240	VSM490KITS-D80Z07WP40PM	80z7	SHELL MILL	P	∇∇	VSM490D080Z07S27XN15	1	XNPU15T608SRMM	WP40PM	20
5966251	VSM490KITS-D100Z08WP40PM	100z8	SHELL MILL	P	∇∇∇	VSM490D100Z08S32XN15	1	XNPU15T608SRMM	WP40PM	20

∇ Heavy/Roughing
∇∇ Medium
∇∇∇ Light Machining/Finishing

(continued)

(VSM490-15 Starter Kits • Metric — continued)

order number	catalogue number	cutter diameter/ flutes	cutter body type	material group	application range	content				
						cutter	qty	inserts	grade	qty
5966252	VSM490KITC-D25Z02WU35PM	25z2	CYLINDRICAL	M+S	∇∇∇	VSM490D025Z02A25XN15L170	1	XNGU15T608ERML	WU35PM	20
5966253	VSM490KITC-D32Z03WU35PM	32z3	CYLINDRICAL	M+S	∇∇∇	VSM490D032Z03A32XN15L200	1	XNGU15T608ERML	WU35PM	20
5966255	VSM490KITS-D40Z04WU35PM	40z4	SHELL MILL	M+S	∇∇∇	VSM490D040Z04S16XN15	1	XNGU15T608ERML	WU35PM	20
5966256	VSM490KITS-D50Z05WU35PM	50z5	SHELL MILL	M+S	∇∇∇	VSM490D050Z05S22XN15	1	XNGU15T608ERML	WU35PM	20
5966257	VSM490KITS-D50Z06WU35PM	50z6	SHELL MILL	M+S	∇∇∇	VSM490D050Z06S22XN15	1	XNGU15T608ERML	WU35PM	20
5966258	VSM490KITS-D63Z06WU35PM	63z6	SHELL MILL	M+S	∇∇∇	VSM490D063Z06S22XN15	1	XNGU15T608ERML	WU35PM	20
5966259	VSM490KITS-D80Z07WU35PM	80z7	SHELL MILL	M+S	∇∇∇	VSM490D080Z07S27XN15	1	XNGU15T608ERML	WU35PM	20
5966260	VSM490KITC-D25Z02WK15PM	25z2	CYLINDRICAL	K	∇	VSM490D025Z02A25XN15L170	1	XNPU15T608SRMM	WK15PM	20
5966261	VSM490KITC-D32Z03WK15PM	32z3	CYLINDRICAL	K	∇	VSM490D032Z03A32XN15L200	1	XNPU15T608SRMM	WK15PM	20
5966262	VSM490KITS-D40Z04WK15PM	40z4	SHELL MILL	K	∇	VSM490D040Z04S16XN15	1	XNPU15T608SRMM	WK15PM	20
5966263	VSM490KITS-D50Z05WK15PM	50z5	SHELL MILL	K	∇	VSM490D050Z05S22XN15	1	XNPU15T608SRMM	WK15PM	20
5966264	VSM490KITS-D50Z06WK15PM	50z6	SHELL MILL	K	∇	VSM490D050Z06S22XN15	1	XNPU15T608SRMM	WK15PM	20
5966265	VSM490KITS-D63Z07WK15PM	63z7	SHELL MILL	K	∇	VSM490D063Z07S22XN15	1	XNPU15T608SRMM	WK15PM	20
5966266	VSM490KITS-D80Z09WK15PM	80z9	SHELL MILL	K	∇	VSM490D080Z09S27XN15	1	XNPU15T608SRMM	WK15PM	20
5966267	VSM490KITS-D100Z11WK15PM	100z11	SHELL MILL	K	∇	VSM490D100Z11S32XN15	1	XNPU15T608SRMM	WK15PM	20

∇ Heavy/Roughing
∇∇ Medium
∇∇∇ Light Machining/Finishing

Good for You, Better for the Environment!

The WIDIA™ Carbide Recycling Program can turn accumulated scrap carbide tooling in your shop into cash.

Carbide Recycling

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EXTREME **RESULTS.**

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It's good for the environment and a responsible way to dispose of scrap carbide.

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- Easy-to-use web portal that shows what your scrap carbide is worth before sending it to us.
- Online forms that make it easy to ship scrap carbide to WIDIA.
- Green Box™ containers for safe, convenient shipping of scrap carbide to WIDIA.
- Cash payment for used carbide tooling.

For more information, contact your local WIDIA Authorised Distributor or visit **widia.com/services.**

WIDIA™

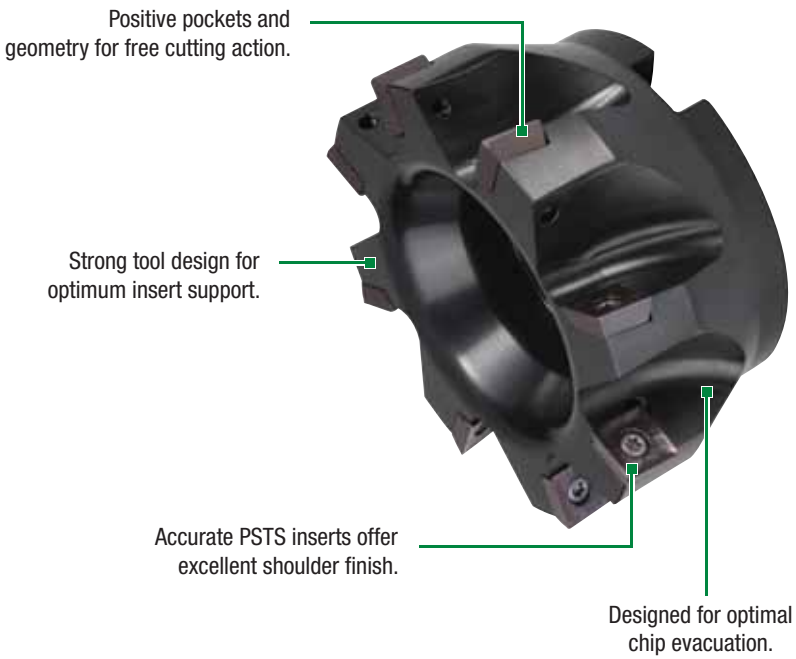
First Choice for Economical Shoulder Milling •

M690 Series 90° Shoulder Mills

M690

Designed to streamline even your most challenging milling operations, the M690 Series provides optimal chip evacuation, excellent shoulder finish, free cutting action, and solid tool design for optimal insert support.

- New SDMX inserts — helical cutting edges for smooth cutting.
- Strong insert and tool design for maximum productivity.
- Four cutting edges enable excellent machining economy.



90° Shoulder Mills

M690 SD1204..

Max depth of cut: 10mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–160mm

Pages: J44–J47

M690 SD1506..

Max depth of cut: 12mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–125mm

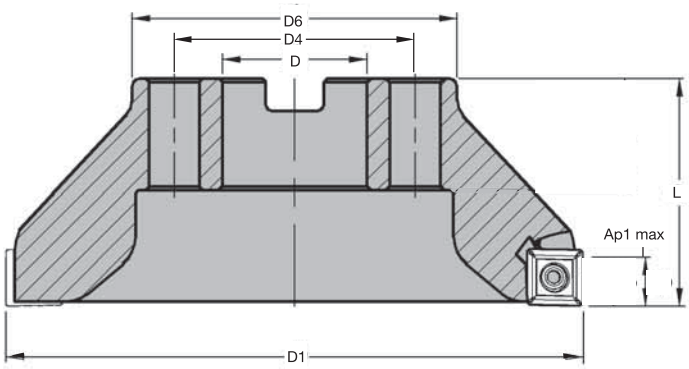
Pages: J48–J51

Insert Offering

12mm iC insert

15mm iC insert

- Four cutting edges.
- 90° shoulders.
- Excellent for slot and profile milling.



Shell Mills

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
2003794	**12396956000**	160	40	66,7	90	63	10,0	15	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 J16.

Spare Parts

insert screw

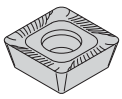
Nm

Torx driver

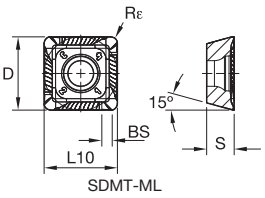
insert screw	Nm	Torx driver
12148037700	4,0	**12148000600**

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	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	TN7535	**.S..MM**	**TN7535**	.S..MH	TN7535
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


SDMT-ML


SDMX-MM



● first choice
○ alternate choice

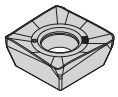
		TN2510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
P		○		●	●	●	●		
M				○	●	○	○		○
K		●	●	○	○		○	●	
N									
S					●				●
H		●							

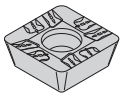
SDMT-ML

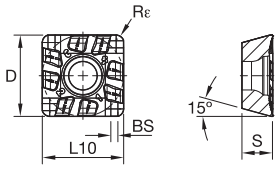
catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMT1204PDRML	4	12,70	12,70	4,77	1,10	1,20	0,08	-	3094667	-	3020185	2030439	2030437	5427423	-

SDMX-MM

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMX120408RMM	4	12,70	12,70	4,76	1,93	0,80	0,10	-	-	3950588	3950589	3950590	3950591	-	5522490
SDMX120412RMM	4	12,70	12,70	4,76	1,50	1,20	0,10	-	-	3950596	3950597	3950599	3950600	-	5519572
SDMX120416RMM	4	12,70	12,70	4,76	1,50	1,60	0,10	-	4145063	4145064	4145065	-	-	-	-
SDMX120424RMM	4	12,70	12,70	4,76	0,60	2,40	0,10	-	-	-	4145072	-	4145093	-	-
SDMX120432RMM	4	12,70	12,70	4,76	–	3,20	0,10	-	-	-	4145094	-	4145095	-	-


SDMX-MH


SDMT-MH



● first choice
○ alternate choice

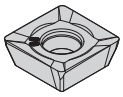
		TN2510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
P		○		●	●	●	●		
M				○	●	○	○		○
K		●	●	○	○		○	●	
N									
S					●				●
H		●							

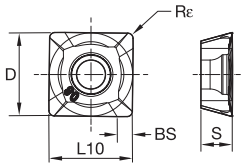
SDMX-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMX120408RMH	4	12,70	12,70	4,76	1,93	0,80	0,14	-	-	-	3950592	3950594	3950595	5427427	-
SDMX120412RMH	4	12,70	12,70	4,76	1,54	1,20	0,14	-	3950614	3950601	3950603	3950605	3950606	5427428	-
SDMX120416RMH	4	12,70	12,70	4,76	1,50	1,60	0,14	-	-	-	3950607	-	3950609	-	-

SDMT-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMT1204PDRMH	4	12,70	12,70	4,81	1,10	1,20	0,14	2028314	3094669	3325040	3326330	2030419	2030417	5427422	-


SDEX-ALP



● first choice
○ alternate choice

		THM-U
P		
M		
K		
N		●
S		
H		

SDEX-ALP

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	THM-U
SDEX120408FRALP	4	12,70	12,70	4,76	1,52	0,80	0,02	5281790

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6520			TN6525			TN6540			TN7525		
P	0	–	–	–	–	–	–	340	**265**	235	300	**235**	200	340	**260**	235
	1	550	**485**	450	–	–	–	340	**265**	235	300	**235**	200	340	**260**	235
	2	340	**310**	275	–	–	–	265	**210**	180	210	**160**	140	260	**210**	180
	3	310	**275**	255	–	–	–	235	**180**	155	180	**140**	115	235	**180**	155
	4	230	**215**	190	–	–	–	195	**140**	120	150	**110**	90	195	**140**	120
	5	275	**250**	230	–	–	–	260	**195**	165	200	**150**	125	260	**195**	165
	6	190	**170**	145	–	–	–	170	**135**	110	135	**100**	85	170	**135**	110
M	1	225	**200**	175	–	–	–	160	**100**	65	110	**65**	50	205	**185**	155
	2	205	**175**	160	–	–	–	100	**65**	40	65	**40**	35	185	**160**	140
	3	160	**145**	125	–	–	–	105	**65**	45	70	**40**	35	145	**130**	115
K	1	350	**300**	250	375	**265**	190	230	**205**	185	185	**170**	150	315	**235**	200
	2	300	**250**	210	325	**210**	160	180	**160**	150	145	**130**	115	270	**200**	165
	3	250	**210**	165	250	**190**	135	150	**135**	120	130	**120**	105	200	**165**	140
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	40	**30**	25	–	–	–
	2	–	–	–	–	–	–	–	–	–	20	**15**	10	–	–	–
	3	–	–	–	–	–	–	–	–	–	60	**35**	25	–	–	–
	4	–	–	–	–	–	–	–	–	–	50	**25**	20	–	–	–
H	1	115	**90**	60	–	–	–	–	–	–	–	–	–	–	–	–
	2	115	**90**	60	–	–	–	–	–	–	–	–	–	–	–	–
	3	85	**65**	45	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TN7535			WK15CM			WS30PM			TTI25			THM-U		
P	0	455	**395**	370	–	–	–	–	–	–	360	**300**	250	–	–	–
	1	455	**395**	370	–	–	–	–	–	–	360	**300**	250	–	–	–
	2	280	**255**	230	–	–	–	–	–	–	260	**210**	180	–	–	–
	3	255	**230**	205	–	–	–	–	–	–	260	**210**	180	–	–	–
	4	190	**175**	160	–	–	–	–	–	–	220	**180**	150	–	–	–
	5	260	**230**	210	–	–	–	–	–	–	265	**195**	165	–	–	–
	6	160	**135**	110	–	–	–	–	–	–	120	**90**	75	–	–	–
M	1	205	**185**	155	–	–	–	225	**200**	185	400	**260**	180	–	–	–
	2	185	**160**	140	–	–	–	205	**180**	145	270	**170**	120	–	–	–
	3	145	**130**	115	–	–	–	155	**135**	105	265	**175**	120	–	–	–
K	1	295	**265**	240	420	**385**	340	–	–	–	185	**155**	130	190	**170**	150
	2	235	**210**	190	335	**295**	275	–	–	–	150	**120**	105	–	–	–
	3	195	**175**	160	280	**250**	230	–	–	–	120	**105**	85	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	2000	**1200**	1000
	2	–	–	–	–	–	–	–	–	–	–	–	–	1365	**815**	665
	3	–	–	–	–	–	–	–	–	–	–	–	–	800	**500**	400
S	1	–	–	–	–	–	–	45	**40**	30	–	–	–	–	–	–
	2	–	–	–	–	–	–	45	**40**	30	–	–	–	–	–	–
	3	–	–	–	–	–	–	55	**45**	30	–	–	–	–	–	–
	4	–	–	–	–	–	–	85	**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.

Recommended Starting Feeds

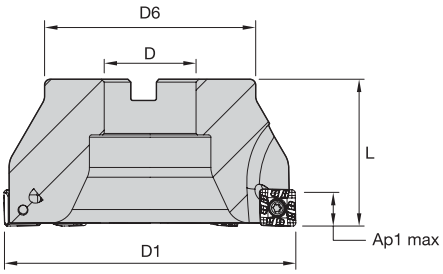
Recommended Starting Feeds [mm]

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.

- Four cutting edges.
- 90° shoulders.
- Excellent for slot and profile milling.



Shell Mills

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

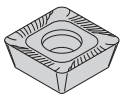
Spare Parts

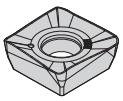
insert screw	Nm	Torx driver
MS2260	6,0	**12148007500**

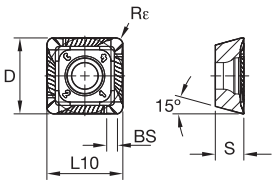
Insert Selection Guide

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	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	TN7535	**.S..MM**	**TN7535**	.S..MH	TN7535
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

Inserts • SD1506..


SDMT-ML


SDMX-MM



● first choice
○ alternate choice

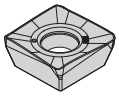
P	○	●	●	●		
M		●	○	○		
K	●	○		○	●	
N						
S		●				
H	●					

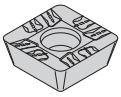
SDMT-ML

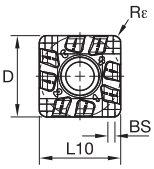
catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6540	TN7525	TN7535	WK15CM
SDMT1506PDRML	4	15,88	15,88	6,32	1,10	1,20	0,08	▪	3378677	2030434	2030420	5427425

SDMX-MM

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6540	TN7525	TN7535	WK15CM
SDMX150612RMM	4	15,88	15,88	6,35	1,45	1,20	0,14	▪	3949807	3949809	▪	▪


SDMX-MH


SDMT-MH



● first choice
○ alternate choice

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

■ SDMX-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6540	TN7525	TN7535	WK15CM
SDMX150612RMH	4	15,88	15,88	6,35	1,45	1,20	0,20	-	3949811	3950583	3950584	5427426
SDMX150616RMH	4	15,88	15,88	6,35	1,51	1,60	0,20	-	3950585	-	3950587	-

■ SDMT-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN2510	TN6540	TN7525	TN7535	WK15CM
SDMT1506PDRMH	4	15,88	15,88	6,35	1,10	1,20	0,20	2028325	3378676	2030414	2030400	5427424

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6540			TN7525			TN7535			WK15CM		
P	0	–	–	–	300	**235**	200	340	**260**	235	455	**395**	370	–	–	–
	1	550	**485**	450	300	**235**	200	340	**260**	235	455	**395**	370	–	–	–
	2	340	**310**	275	210	**160**	140	260	**210**	180	280	**255**	230	–	–	–
	3	310	**275**	255	180	**140**	115	235	**180**	155	255	**230**	205	–	–	–
	4	230	**215**	190	150	**110**	90	195	**140**	120	190	**175**	160	–	–	–
	5	275	**250**	230	200	**150**	125	260	**195**	165	260	**230**	210	–	–	–
	6	190	**170**	145	135	**100**	85	170	**135**	110	160	**135**	110	–	–	–
M	1	225	**200**	175	110	**65**	50	205	**185**	155	205	**185**	155	–	–	–
	2	205	**175**	160	65	**40**	35	185	**160**	140	185	**160**	140	–	–	–
	3	160	**145**	125	70	**40**	35	145	**130**	115	145	**130**	115	–	–	–
K	1	350	**300**	250	185	**170**	150	315	**235**	200	295	**265**	240	420	**385**	340
	2	300	**250**	210	145	**130**	115	270	**200**	165	235	**210**	190	335	**295**	275
	3	250	**210**	165	130	**120**	105	200	**165**	140	195	**175**	160	280	**250**	230
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	40	**30**	25	–	–	–	–	–	–	–	–	–
	2	–	–	–	20	**15**	10	–	–	–	–	–	–	–	–	–
	3	–	–	–	60	**35**	25	–	–	–	–	–	–	–	–	–
	4	–	–	–	50	**25**	20	–	–	–	–	–	–	–	–	–
H	1	115	**90**	60	–	–	–	–	–	–	–	–	–	–	–	–
	2	115	**90**	60	–	–	–	–	–	–	–	–	–	–	–	–
	3	85	**65**	45	–	–	–	–	–	–	–	–	–	–	–	–

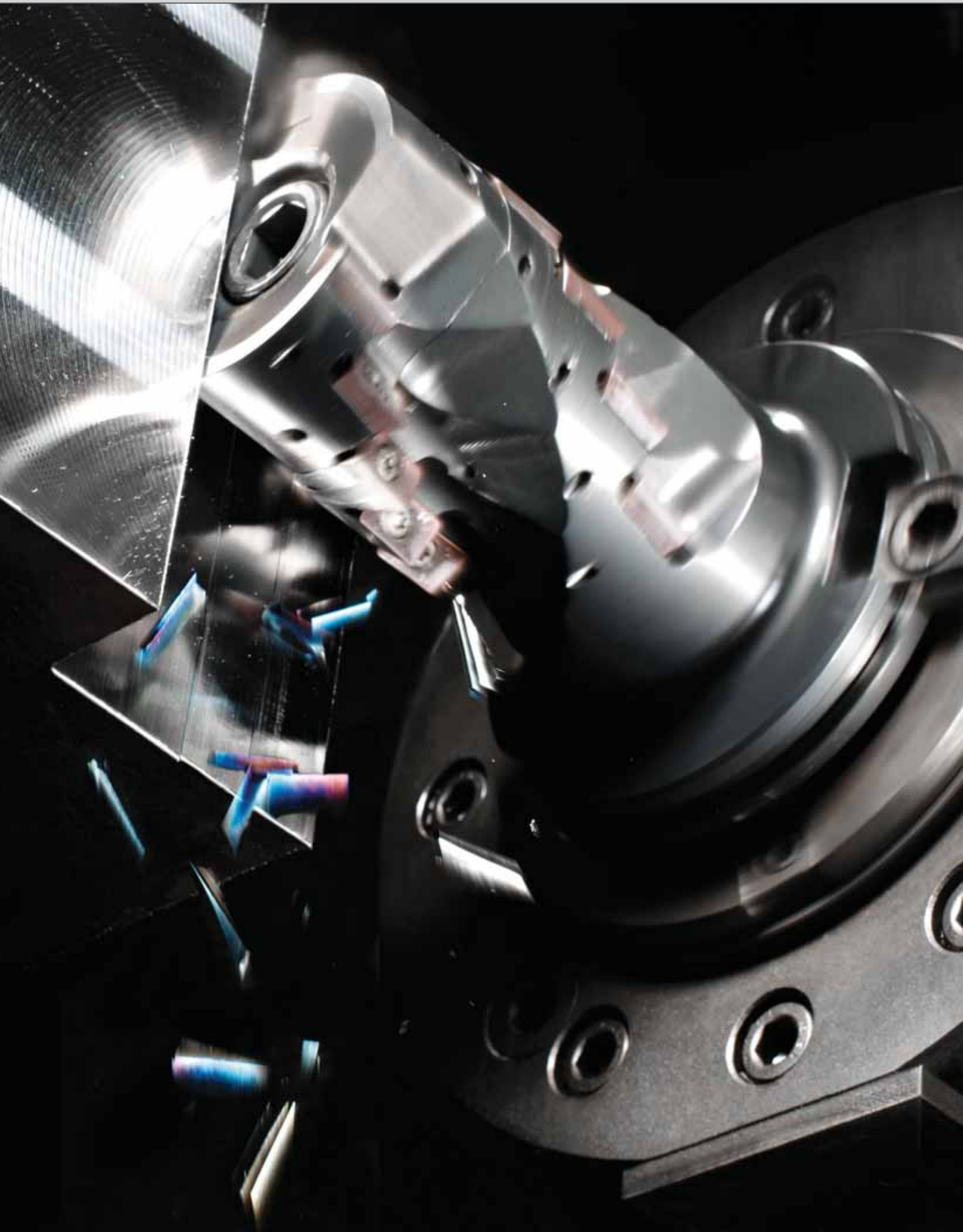
*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

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.



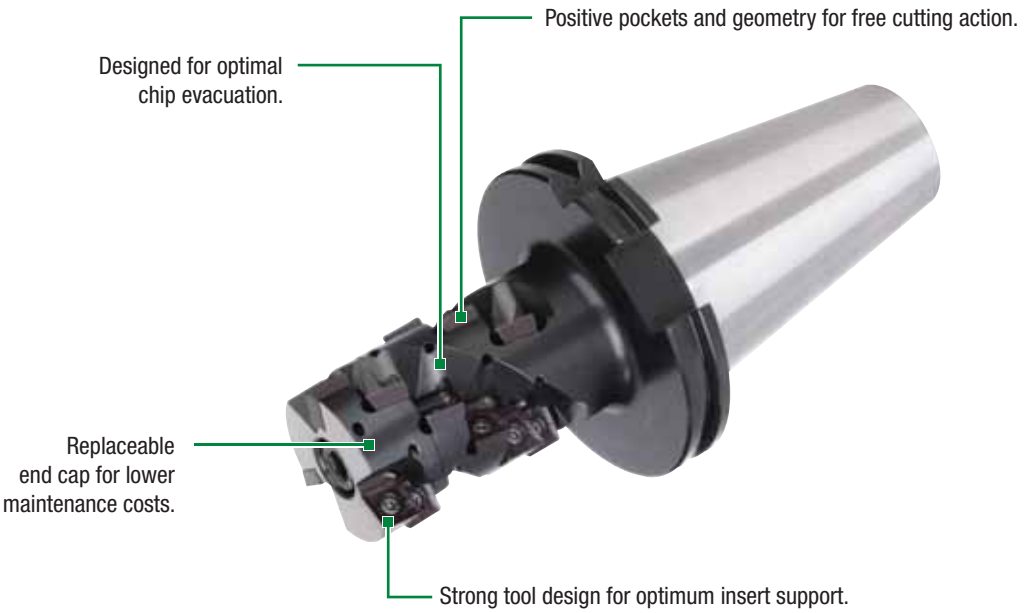
Indexable Milling • Helical Mills

First Choice for High Productivity Helical Milling •
M390 Series

M390

With a replaceable nose collar and positive helix for increased productivity, the M390 Series Helical Mills provide optimal chip evacuation and performance with lower maintenance costs.

- Strong insert and tool design for maximum productivity.
- New SDMX inserts — helical cutting edge for smooth cutting.
- Long edge shoulder ensures stable insert support.



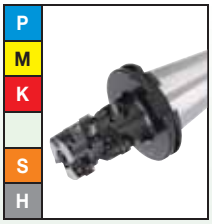
Helical Mills

M390 SD1204...

Max depth of cut: 17mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–80mm

Pages: K4–K9



Maximum cutting depth (Ap1) and contact width (ae) ratios based on application type

Slot Milling

ae = 1 x D1
Ap1 max = 0,6 x D1

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

Contouring

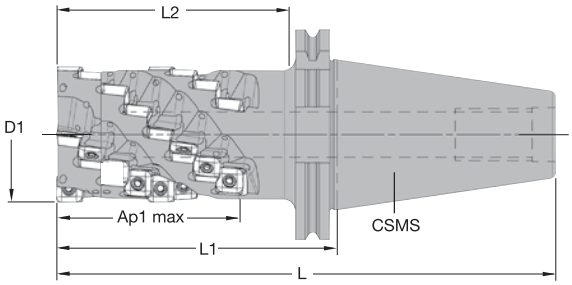
ae = 0,25–0,4 x D1
Ap1 max = 1 x D1
ae = >0,4 x D1
Ap1 max = 0,6 x D1

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

Profiling

ae = <0,25 x D1
Ap1 max = Ap1 max

- Four cutting edges per insert.
- Replaceable end cap.
- Positive helix for high productivity.



Integral

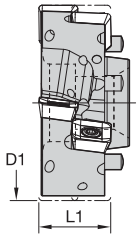
order number	catalogue number	D1	L	L1	L2	Ap1 max	Z	Z U	CSMS system size	max RPM	coolant supply	kg
2021422	**12393041200**	50	207	105	82	64,0	18	3	DV50	14000	Yes	3,4
2021423	**12393041400**	63	232	130	107	85,0	32	4	DV50	12000	Yes	4,3
2021424	**12393041800**	80	262	160	137	117,0	55	5	DV50	10500	Yes	6,3

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

Spare Parts

D1	 insert screw	 Nm	 Torx wrench	 end cap	 socket-head cap screw
50	**12148037700**	4,0	**12148000600**	**12393051200**	**12147625400**
63	**12148037700**	4,0	**12148000600**	**12393051400**	**12148783700**
80	**12148037700**	4,0	**12148000600**	**12393051800**	**12148783700**

- Four cutting edges per insert.
- Replaceable end cap.
- Positive helix for high productivity.



End Cap

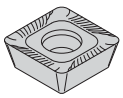
order number	catalogue number	D1	L1	Z U	Z	kg
2021428	**12393051200**	50	21	3	6	0,2
2021429	**12393051400**	63	21	4	8	0,3
2021430	**12393051800**	80	21	5	10	0,5

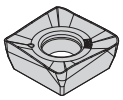
NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

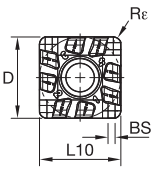
Insert Selection Guide

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	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	TN7535	**.S..MM**	**TN7535**	.S..MH	TN7535
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

Inserts • SD1204..


SDMT-ML


SDMX-MM



● first choice
○ alternate choice

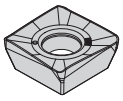
P			●	●	●	●		
M			○	●	○	○		○
K		●	○	○		○	●	
N								
S				●				●
H								

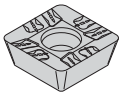
SDMT-ML

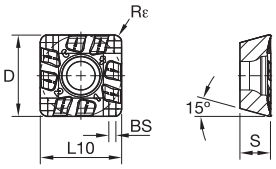
catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMT1204PDRML	4	12,70	12,70	4,77	1,10	1,20	0,08	3094667	-	3020185	2030439	2030437	5427423	-

SDMX-MM

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMX120408RMM	4	12,70	12,70	4,76	1,93	0,80	0,10	-	3950588	3950589	3950590	3950591	-	5522490
SDMX120412RMM	4	12,70	12,70	4,76	1,50	1,20	0,10	-	3950596	3950597	3950599	3950600	-	5519572
SDMX120416RMM	4	12,70	12,70	4,76	1,50	1,60	0,10	4145063	4145064	4145065	-	-	-	-
SDMX120424RMM	4	12,70	12,70	4,76	0,60	2,40	0,10	-	-	4145072	-	4145093	-	-
SDMX120432RMM	4	12,70	12,70	4,76	–	3,20	0,10	-	-	4145094	-	4145095	-	-


SDMX-MH


SDMT-MH



● first choice
○ alternate choice

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

■ SDMX-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMX120408RMH	4	12,70	12,70	4,76	1,93	0,80	0,14	-	-	3950592	3950594	3950595	5427427	-
SDMX120412RMH	4	12,70	12,70	4,76	1,54	1,20	0,14	3950614	3950601	3950603	3950605	3950606	5427428	-
SDMX120416RMH	4	12,70	12,70	4,76	1,50	1,60	0,14	-	-	3950607	-	3950609	-	-

■ SDMT-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMT1204PDRMH	4	12,70	12,70	4,81	1,10	1,20	0,14	3094669	3325040	3326330	2030419	2030417	5427422	-

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			TN7525		
P	0	–	–	–	340	**265**	235	300	**235**	200	340	**260**	235
	1	–	–	–	340	**265**	235	300	**235**	200	340	**260**	235
	2	–	–	–	265	**210**	180	210	**160**	140	260	**210**	180
	3	–	–	–	235	**180**	155	180	**140**	115	235	**180**	155
	4	–	–	–	195	**140**	120	150	**110**	90	195	**140**	120
	5	–	–	–	260	**195**	165	200	**150**	125	260	**195**	165
	6	–	–	–	170	**135**	110	135	**100**	85	170	**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	315	**235**	200
	2	325	**210**	160	180	**160**	150	145	**130**	115	270	**200**	165
	3	250	**190**	135	150	**135**	120	130	**120**	105	200	**165**	140
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	40	**30**	25	–	–	–
	2	–	–	–	–	–	–	20	**15**	10	–	–	–
	3	–	–	–	–	–	–	60	**35**	25	–	–	–
	4	–	–	–	–	–	–	50	**25**	20	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		TN7535			WK15CM			WS30PM		
P	0	455	**395**	370	–	–	–	–	–	–
	1	455	**395**	370	–	–	–	–	–	–
	2	280	**255**	230	–	–	–	–	–	–
	3	255	**230**	205	–	–	–	–	–	–
	4	190	**175**	160	–	–	–	–	–	–
	5	260	**230**	210	–	–	–	–	–	–
	6	160	**135**	110	–	–	–	–	–	–
M	1	205	**185**	155	–	–	–	225	**200**	185
	2	185	**160**	140	–	–	–	205	**180**	145
	3	145	**130**	115	–	–	–	155	**135**	105
K	1	295	**265**	240	420	**385**	340	–	–	–
	2	235	**210**	190	335	**295**	275	–	–	–
	3	195	**175**	160	280	**250**	230	–	–	–
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	45	**40**	30
	2	–	–	–	–	–	–	45	**40**	30
	3	–	–	–	–	–	–	55	**45**	30
	4	–	–	–	–	–	–	85	**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.

Recommended Starting Feeds

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.

Indexable Milling • Slotting Mills

Reliable, Powerful, and Durable Milling Tools •

M16 Series T-Slotting Mills

M16

Designed for maximum chip evacuation and optimum security, the M16 Series Slotting Mills are an excellent choice for T-slot milling of steel and cast iron.

- Strong and sturdy tool design ensures reliable steel and cast iron machining, time after time.
- Maximum chip evacuation streamlines your most challenging milling operations.

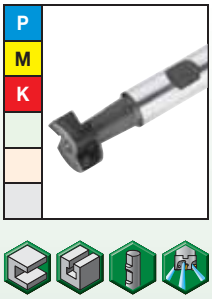
Slotting Mills

M16

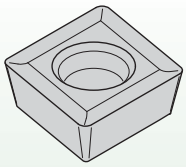
Slot Width Range:
11–21,9mm

Indexes per insert: 2
Diameter: 25–50mm

Pages: L4–L7



Insert Offering



Inserts with positive chipbreaker providing low cutting forces.

T-Slotting

Steel

- If machining a vertical slot, minimise 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

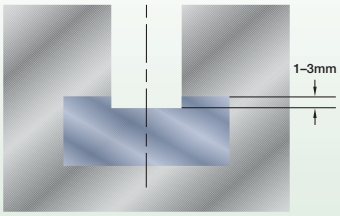


Figure 2

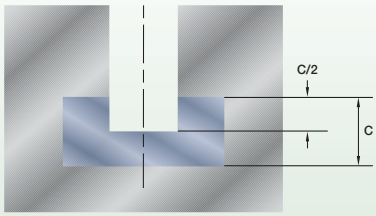
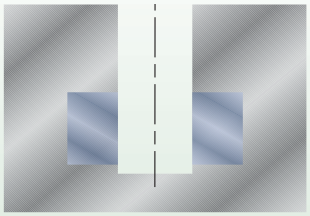
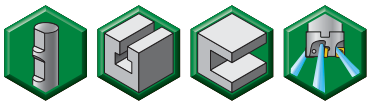


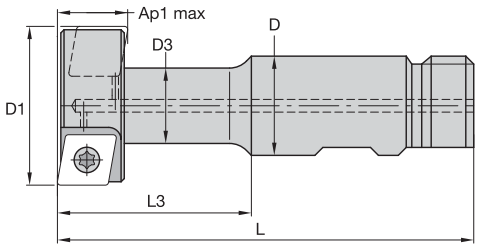
Figure 3



NOTE: Air blast is recommended to disperse the chips.

- T-slot mill.
- Ideal for steel and cast iron machining.





Weldon Shanks

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

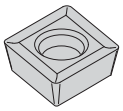
NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

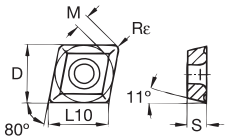
Spare Parts

D1	insert screw	Nm	Torx driver	Torx wrench
25	**12148068700**	1,0	**12148086600**	–
32	**12148067200**	2,0	**12148086600**	–
40	**12148038800**	3,0	–	**12148000600**
50	**12148007200**	4,0	–	**12148007500**

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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	–	–	–	–	–	–


CPNT



● first choice
○ alternate choice

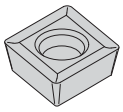
P		●	●
M		○	●
K	●	○	
N			
S			○
H			

CPNT • CP0602..

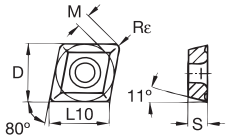
catalogue number	cutting edges	D	L10	M	S	Rε	hm	WK15CM	WP35CM	WP40PM
CPNT060204T	2	6,35	6,45	1,54	2,38	0,40	0,03	5903680	5903676	5578222

CPNT • CP0803..

catalogue number	cutting edges	D	L10	M	S	Rε	hm	WK15CM	WP35CM	WP40PM
CPNT080308T	2	7,94	8,06	1,76	3,18	0,80	0,09	5903701	5903677	–



CPNT



● first choice
○ alternate choice

P	●	●	
M		○	●
K	●	○	
N			
S			○
H			

■ CPNT • CP09T3..

catalogue number	cutting edges	D	L10	M	S	Rε	hm	WK15CM	WP35CM	WP40PM
CPNT09T308T	2	9,52	9,67	2,20	3,97	0,80	0,04	5903702	5903678	'

■ CPNT • CP1204..

catalogue number	cutting edges	D	L10	M	S	Rε	hm	WK15CM	WP35CM	WP40PM
CPNT120408T	2	12,70	12,90	3,08	4,76	0,80	0,03	5903703	5903679	'

Recommended Starting Speeds [m/min]

Material Group		WK15CM			WP35CM			WP40PM		
P	0	–	**–**	–	455	**395**	370	295	**260**	245
	1	–	**–**	–	455	**395**	370	295	**260**	245
	2	–	**–**	–	280	**255**	230	250	**215**	180
	3	–	**–**	–	255	**230**	205	230	**195**	160
	4	–	**–**	–	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	420	**385**	340	295	**265**	240	–	**–**	–
	2	335	**295**	275	235	**210**	190	–	**–**	–
	3	280	**250**	230	195	**175**	160	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
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.

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%			
CPNT	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	CPNT
CPNT	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	CPNT
CPNT	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	CPNT
CPNT	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	CPNT

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

For Precise Slotting and Grooving Applications •

M94 Series Slotting Mills

M94

The M94 Series Slotting Mills are equipped with three cutting edges per insert and precise cooling capabilities for the most demanding small width slotting and grooving operations.

- Coolant grooves provide accurate and consistent cooling performance.
- Perfect choice when shallow grooving and slotting are required.
- Tangential mounted inserts ensure maximum strength and stability.

Slotting Mills

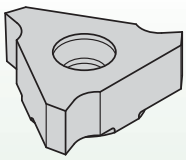
M94

Slot Width Range:
1,93–5,23mm

Indexes per insert: 3
Diameter: 25–80mm

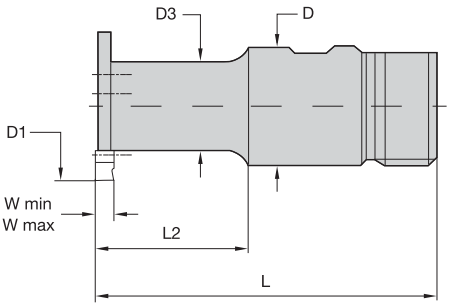
Pages: L10–L14

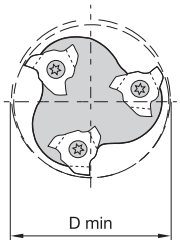
Insert Offering



Inserts with free-cutting geometry providing low cutting forces.

- Three cutting edges per insert.
- Tangential mounted inserts.
- Shallow grooving and slotting.





Weldon Shanks

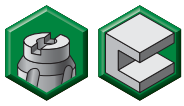
order number	catalogue number	D1	D	D3	D min	L	L2	W min	W max	Z	insert 1	coolant supply	kg
2022619	**12290900800**	25	25	21	34	100	44	1,93	2,73	3	TCAX1103ZZ..	No	0,4
2022620	**12290901200**	40	32	32	65	110	50	2,73	4,26	3	TNAX1604ZZ..	No	0,7

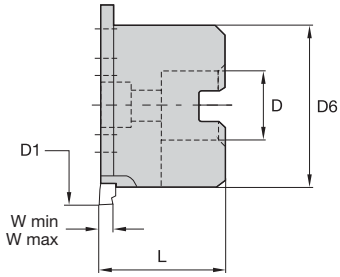
NOTE: D min = minimum internal hole diameter required for clearance.

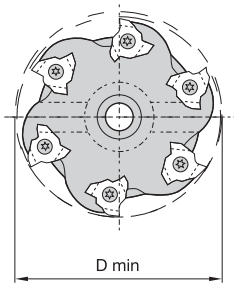
Spare Parts

D1	 insert screw	 Nm	 Torx driver
25	**12148080000**	1,0	**12148086600**
40	**12148067200**	3,5	**12148086600**

- Three cutting edges per insert.
- Tangential mounted inserts.
- Shallow grooving and slotting.







Shell Mills

order number	catalogue number	D1	D	D min	D6	L	W min	W max	Z	insert 1	coolant supply	kg
2022621	**12290911600**	63	22	85	55	40	2,73	4,26	6	TNAX1604ZZ..	No	0,7
2022622	**12290911800**	80	27	102	68	50	4,26	5,23	6	TNAX2206ZZ..	No	1,3

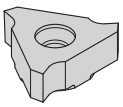
NOTE: D min = minimum internal hole diameter required for clearance.

Spare Parts

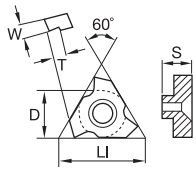
D1	 insert screw	 Nm	 Torx driver	 Torx driver
63	**12148067200**	3,5	–	**12148086600**
80	**12148007200**	6,0	**12148007500**	–

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	TCAX/TNAX	TTM/TTM08	**TCAX/TNAX**	**TTM/TTM08**	TCAX/TNAX	TTM/TTM08
P3–P4	TCAX/TNAX	TTM/TTM08	**TCAX/TNAX**	**TTM/TTM08**	TCAX/TNAX	TTM/TTM08
P5–P6	TCAX/TNAX	TTM/TTM08	**TCAX/TNAX**	**TTM/TTM08**	TCAX/TNAX	TTM/TTM08
M1–M2	TCAX/TNAX	TTM/TTM08	**TCAX/TNAX**	**TTM/TTM08**	TCAX/TNAX	TTM/TTM08
M3	TCAX/TNAX	TTM/TTM08	**TCAX/TNAX**	**TTM/TTM08**	TCAX/TNAX	TTM/TTM08
K1–K2	TCAX/TNAX	TTM/TTM08	**TCAX/TNAX**	**TTM/TTM08**	TCAX/TNAX	TTM/TTM08
K3	TCAX/TNAX	THM	**TCAX/TNAX**	**THM**	TCAX/TNAX	THM
N1–N2	TCAX/TNAX	THM	**TCAX/TNAX**	**THM**	TCAX/TNAX	THM
N3	TCAX/TNAX	THM	**TCAX/TNAX**	**THM**	TCAX/TNAX	THM
S1–S2	TCAX/TNAX	THM	**TCAX/TNAX**	**THM**	TCAX/TNAX	THM
S3	TCAX/TNAX	THM	**TCAX/TNAX**	**THM**	TCAX/TNAX	THM
S4	TCAX/TNAX	THM	**TCAX/TNAX**	**THM**	TCAX/TNAX	THM
H1	–	–	–	–	–	–



TCAX
TNAX



● first choice
○ alternate choice

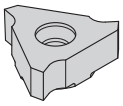
P		●	●
M		○	○
K		○	○
N	●		
S	○		
H			

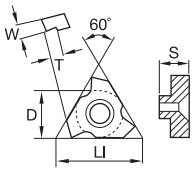
TCAX • 1103..

catalogue number	cutting edges	D	LI	W	T	S	hm	THM	TTM	TTM08
TCAX1103ZZ18	3	6,35	11,00	1,93	2,10	3,20	0,07	-	-	2014041
TCAX1103ZZ21	3	6,35	11,00	2,23	2,25	3,20	0,07	2026017	-	2026018
TCAX1103ZZ26	3	6,35	11,00	2,73	2,35	3,20	0,07	2014054	2014056	-

TNAX • 1604..

catalogue number	cutting edges	D	LI	W	T	S	hm	THM	TTM	TTM08
TNAX1604ZZ26	3	9,52	16,49	2,73	3,08	4,76	0,07	2014152	-	2014164
TNAX1604ZZ31	3	9,52	16,49	3,26	3,04	4,76	0,07	2014166	-	2014168
TNAX1604ZZ41	3	9,52	16,49	4,26	3,32	4,76	0,07	2014170	2014172	-


TNAX



● first choice
○ alternate choice

		THM	TTM	TTM08
P			●	●
M			○	○
K		○	○	○
N		●		
S		○		
H				

■ TNAX • 2206..

catalogue number	cutting edges	D	LI	W	T	S	hm	THM	TTM	TTM08
TNAX2206ZZ41	3	12,70	22,00	4,26	4,02	6,40	0,07	▮	2014176	▮
TNAX2206ZZ51	3	12,70	22,00	5,23	4,43	6,40	0,07	▮	2026022	▮

Recommended Starting Speeds [m/min]

Material Group		THM			TTM/TTM08		
P	1	–	–	–	560	**490**	460
	2	–	–	–	345	**280**	245
	3	–	–	–	345	**280**	245
	4	–	–	–	280	**195**	180
	5	–	–	–	360	**280**	260
	6	–	–	–	165	**130**	115
M	1	–	–	–	330	**195**	130
	2	–	–	–	195	**115**	80
	3	–	–	–	215	**130**	100
K	1	395	**295**	245	–	–	–
	2	410	**330**	230	–	–	–
	3	425	**310**	195	–	–	–
N	1	2950	**1970**	1640	–	–	–
	2	2245	**1525**	1265	–	–	–
	3	1475	**920**	655	–	–	–
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.

Recommended Starting Feeds

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%			
TCAX/TNAX	0,12	**0,29**	0,45	0,08	**0,21**	0,33	0,06	**0,16**	0,25	0,06	**0,14**	0,21	0,05	**0,13**	0,20	TCAX/TNAX

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

Easy Access to Proven Metalworking Expertise!

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EXTREME **RESULTS.**

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WIDIA™

M95

M95 slotting cutters are ideal for deeper applications that require the cutting load to be shared from one insert to the other. They provide groove widths from 4–10mm and cutter diameters from 100–200mm as well as an economical way to achieve balanced cutting.

Features and Benefits

- Cutters available in arbour mount.
- Inserts with four indexes.
- Staggered keyways in mounting bore, used for multiple ganged cutters.
- Slot width 4–10mm.
- Three insert geometries available; SNHX in 11 and 12mm iC.
- Requires only one spare part.
- Economical to use.
- Available in Latest WIDIA™ Victory™ Grade.

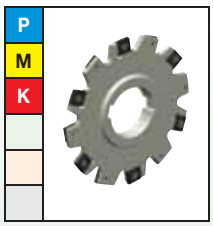
Slotting Mills

M95

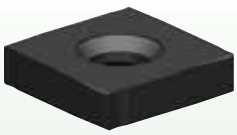
Slot Width Range:
4–10mm

Indexes per insert: 4
Diameter: 100–200mm

Pages: L18–L21

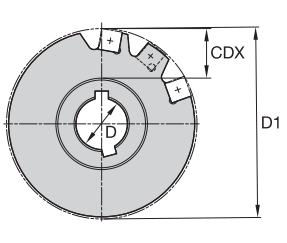


Insert Offering



SNHX

Inserts with free-cutting geometry providing low cutting forces.



M95

order number	catalogue number	D1	D	D6	B min	CDX	THUB	Z	Z S	coolant supply	kg
2016502	**12299510400**	100	27	48	4	25,0	12,0	12	6	No	0,3
2016514	**12299515500**	100	27	48	5	25,0	12,0	12	6	No	0,3
2016516	**12299515600**	100	27	48	6	25,0	12,0	10	5	No	0,3
2016518	**12299515700**	100	27	48	7	25,0	12,0	9	3	No	0,3
2016520	**12299515800**	100	27	48	8	25,0	12,0	9	3	No	0,4
2016524	**12299520400**	125	40	58	4	32,5	12,0	14	7	No	0,4
2016526	**12299525500**	125	40	58	5	32,5	12,0	14	7	No	0,4
2016528	**12299525600**	125	40	58	6	32,5	12,0	12	6	No	0,5
2016530	**12299525700**	125	40	58	7	32,5	12,0	12	4	No	0,5
2016532	**12299525800**	125	40	58	8	32,5	12,0	12	4	No	0,6
2016544	**12299526000**	125	40	58	10	32,5	12,0	12	6	No	0,6
2016547	**12299530400**	160	40	68	4	45,0	12,0	18	9	No	0,7
2022648	**12299535500**	160	40	68	5	45,0	12,0	18	9	No	0,7
2016551	**12299535600**	160	40	68	6	45,0	12,0	16	8	No	1,0
2022649	**12299535700**	160	40	68	7	45,0	12,0	15	5	No	1,0
2016555	**12299535800**	160	40	68	8	45,0	12,0	15	5	No	1,1
2022650	**12299536000**	160	40	68	10	45,0	12,0	16	8	No	1,2
2016562	**12299546000**	200	22	72	10	63,0	12,0	18	9	No	1,9
2022652	**12299545800**	200	50	72	8	63,0	12,0	18	6	No	1,6

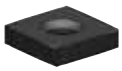
Spare Parts

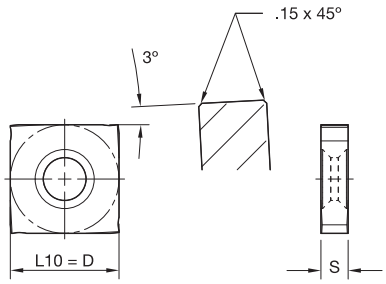



D1	B min	insert screw	Nm	wrench	bushing
100	4	**12147548500**	1,2	**170.023**	**–**
100	5	**12147562300**	1,2	**170.023**	**12147676800**
100	6	**12147548600**	5,0	**170.025**	**12147676900**
100	7	**12147548600**	5,0	**170.025**	**12147676900**
100	8	**12147548600**	5,0	**170.025**	**12147676900**
125	4	**12147548500**	1,2	**170.023**	**–**
125	5	**12147562300**	1,2	**170.023**	**12147676800**
125	6	**12147548600**	5,0	**170.025**	**12147676900**
125	7	**12147548600**	5,0	**170.025**	**12147676900**
125	8	**12147548600**	5,0	**170.025**	**12147676900**
125	10	**12147572400**	5,0	**170.025**	**12147677000**
160	4	**12147548500**	1,2	**170.023**	**–**
160	5	**12147562300**	1,2	**170.023**	**12147676800**
160	6	**12147548600**	5,0	**170.025**	**12147676900**
160	7	**12147548600**	5,0	**170.025**	**12147676900**
160	8	**12147548600**	5,0	**170.025**	**12147676900**
160	10	**12147572400**	5,0	**170.025**	**12147677000**
200	8	**12147548600**	5,0	**170.025**	**12147676900**
200	10	**12147572400**	5,0	**170.025**	**12147677000**

Insert Selection Guide

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


SNHX



P		●	●
M		○	●
K	●	○	
N			
S			○
H			

● first choice
○ alternate choice

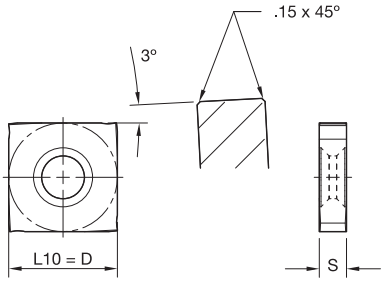
SNHX • 12,7mm iC

catalogue number	cutting edges	D	L10	S	hm	WK15CM	WP35CM	WP40PM
123506601	4	12,70	12,70	3,18	0,08	5903650	5903674	5903646

SNHX • 11mm iC

catalogue number	cutting edges	D	L10	S	hm	WK15CM	WP35CM	WP40PM
123506599	4	11,00	11,00	2,38	0,08	5903648	5903672	5903644


SNHX



● first choice
○ alternate choice

P		●	●
M		○	●
K	●	○	
N			
S			○
H			

■ SNHX • 11mm iC

catalogue number	cutting edges	D	L10	S	hm	WK15CM	WP35CM	WP40PM
123506600	4	11,00	11,00	2,70	0,08	5903649	5903673	5903645

■ SNHX • 12,7mm iC

catalogue number	cutting edges	D	L10	S	hm	WK15CM	WP35CM	WP40PM
123506602	4	12,70	12,70	5,40	0,08	5903671	5903675	5903647

Recommended Starting Speeds [m/min]

Material Group		WK15CM			WP35CM			WP40PM		
P	0	–	**–**	–	455	**395**	370	295	**260**	245
	1	–	**–**	–	455	**395**	370	295	**260**	245
	2	–	**–**	–	280	**255**	230	250	**215**	180
	3	–	**–**	–	255	**230**	205	230	**195**	160
	4	–	**–**	–	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	420	**385**	340	295	**265**	240	–	**–**	–
	2	335	**295**	275	235	**210**	190	–	**–**	–
	3	280	**250**	230	195	**175**	160	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	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.

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%			
SNHX	0,12	**0,28**	0,71	0,08	**0,20**	0,51	0,06	**0,15**	0,38	0,06	**0,13**	0,33	0,05	**0,12**	0,30	SNHX

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

WIDIA™ M900™ Series •
Adjustable Slotting Cutters

The WIDIA M900 Series is a multipurpose slotting cutter with high-precision capability for numerous operations. The cutter is one of the most productive of its kind for slotting and for cut-off operations. Two keyways in the cutter provide wide slot options by mounting several cutters together in a gang-slotting style operation.

M900

Features

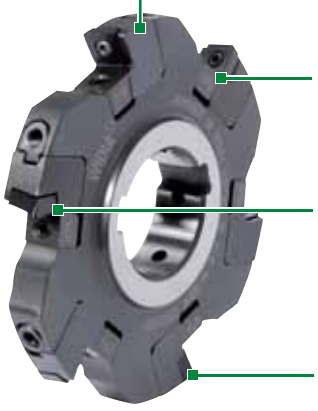
- Insert geometries and grades for various workpiece materials.
- Easy setting for desired width.
- Superior cartridge sliding mechanism.
- Available in arbour and shell mount.
- Two keyways for staggered slotting.
- Strong, reliable pocket seat.

Benefits

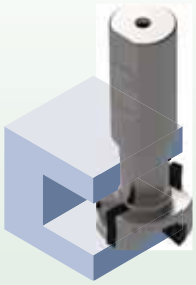
- Wide range of slot width options.
- High accuracy of slots.
- Security/stability of cartridge cutter.
- Wide range of mounting options.
- Multiple slots by gang slotting.

Application

- Full slotting.
- Half slotting (left and right styles).
- Gang slotting.
- Shoulder milling.
- Face milling.
- Back face milling.



Slotting Mills



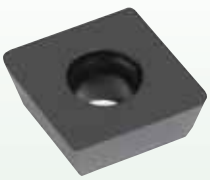
M900™

Slot Width Range:
12–22mm

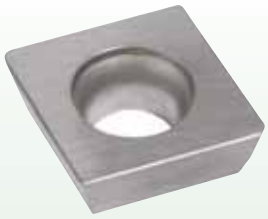
Indexes per insert: 2
Diameter: 100–315mm

Pages: L24–L30, L32–L33

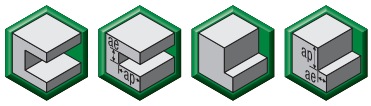
Insert Offering

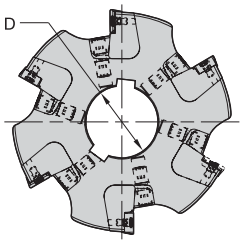


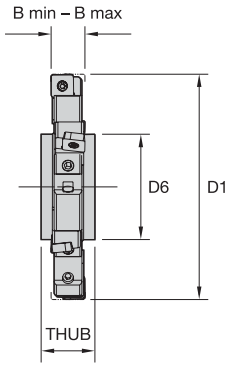
MDHX Geometry
iC 09mm



MDHW Geometry
iC 12mm







Arbour Mount • 9mm

order number	catalogue number	D1	D	D6	B min	B max	THUB	Z	max RPM	coolant supply	kg
2003598	**12399010200**	100	32	48	12	14	16,0	6	7070	No	0,5
2067540	**12399011400**	100	32	48	14	16	16,0	6	7070	No	0,8
2003695	**12399010400**	125	40	58	12	14	16,0	8	6370	No	0,8
2003696	**12399011600**	125	40	58	14	16	16,0	8	6370	No	0,9
2003697	**12399012800**	125	40	58	16	18	20,0	8	6370	No	1,1
2003796	**12399011800**	160	40	58	14	16	16,0	10	5600	No	1,6
2003797	**12399013000**	160	40	58	16	18	20,0	10	5600	No	1,9
2065591	**12399010800**	200	50	72	12	14	16,0	12	5040	No	2,1
2003879	**12399012000**	200	50	72	14	16	16,0	12	5040	No	2,6
2003880	**12399013200**	200	50	72	16	18	20,0	12	5040	No	2,9
2067541	**12399013400**	250	50	72	16	18	20,0	16	4480	No	7,0
2116241	**12399013600**	315	60	84	16	18	20,0	20	3990	No	7,6

Spare Parts

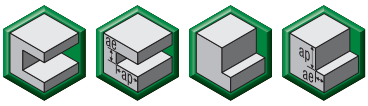


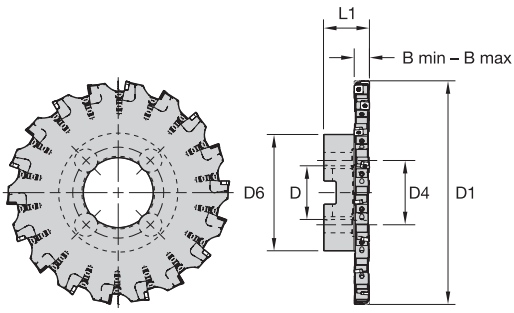






D1	insert screw	Torx driver	STC screw	T-handle hex wrench	clamp wedge	cartridge left-hand	cartridge right-hand	adjusting wedge left-hand	adjusting wedge right-hand
100	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
100	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
125	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
125	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
125	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
160	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
160	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
200	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
200	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
200	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
250	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
315	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**





Shell Mount • 9mm

order number	catalogue number	D1	D	D4	D6	B min	B max	L1	Z	max RPM	coolant supply	kg
2003602	**12399111400**	100	27	–	48	14	16	33,0	6	7070	No	0,8
2003700	**12399110400**	125	32	–	58	12	14	37,0	8	6370	No	1,1
2003701	**12399111600**	125	32	–	58	14	16	37,0	8	6370	No	1,2
2003702	**12399112800**	125	32	–	58	16	18	37,0	8	6370	No	1,4
2003800	**12399110600**	160	40	–	70	12	14	42,0	10	5600	No	1,8
2003801	**12399111800**	160	40	–	70	14	16	42,0	10	5600	No	2,1
2003802	**12399113000**	160	40	–	70	16	18	42,0	10	5600	No	2,3
2003897	**12399110800**	200	40	67	90	12	14	44,0	12	5040	No	3,0
2003898	**12399112000**	200	40	67	90	14	16	44,0	12	5040	No	3,3
2003899	**12399113200**	200	40	67	90	16	18	44,0	12	5040	No	3,7
2003997	**12399113400**	250	60	102	130	16	18	50,0	16	4480	No	7,0
2004095	**12399113600**	315	60	102	130	16	18	50,0	20	3990	No	9,7

Spare Parts







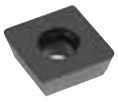


D1	insert screw	Torx driver	STC screw	T-handle hex wrench	clamp wedge	cartridge left-hand	cartridge right-hand	adjusting wedge left-hand	adjusting wedge right-hand
125	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
100	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
125	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
125	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
160	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
160	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
160	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
200	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210100**	**12748210200**	**12748551100**	**12748551200**
200	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307600**	**12748210300**	**12748210400**	**12748551100**	**12748551200**
200	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
250	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**
315	**12148067200**	**12749726100**	**12148574100**	**12148050000**	**12748307700**	**12748210500**	**12748210600**	**12748551100**	**12748551200**

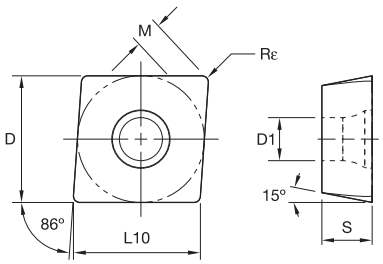
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	MDHX	WP40PM	**MDHX**	**WP40PM**	MDHX	WP40PM
P3–P4	MDHX	WP35CM	**MDHX**	**WP35CM**	MDHX	WP35CM
P5–P6	MDHX	WP35CM	**MDHX**	**WP40PM**	MDHX	WU35PM
M1–M2	MDHX	WP25PM	**MDHX**	**WP25PM**	MDHX	WU35PM
M3	MDHX	WP35CM	**MDHX**	**WP40PM**	MDHX	WU35PM
K1–K2	MDHX	WK15CM	**MDHX**	**WK15CM**	MDHX	WK15CM
K3	MDHX	WK15CM	**MDHX**	**WP35CM**	MDHX	WP35CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	MDHX	WP25PM	**MDHX**	**WU35PM**	MDHX	WU35PM
S3	MDHX	WU35PM	**MDHX**	**WU35PM**	MDHX	WU35PM
S4	MDHX	WP25PM	**MDHX**	**WU35PM**	MDHX	WU35PM
H1	–	–	**–**	**–**	–	–

Inserts • MDH..


MDHX


MDHX



● first choice
○ alternate choice

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

MDHX

catalogue number	cutting edges	D	D1	L10	M	S	Rε	WK15CM	WP25PM	WU35PM	WP35CM	WP40PM
MDHX09T308	2	9,53	3,40	9,55	1,85	3,97	0,80	5903706	5903722	5903710	5903708	5903704

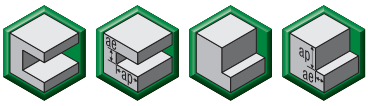
Recommended Starting Feeds

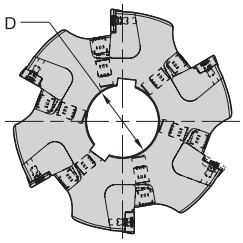
Recommended Starting Feeds [mm]

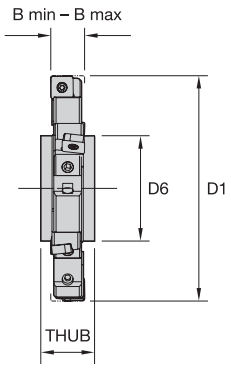
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MDHX	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	MDHX

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







Arbour Mount • 12mm

order number	catalogue number	D1	D	D6	B min	B max	THUB	Z	max RPM	coolant supply	kg
2003881	**12399014400**	200	50	72	18	20	20,0	12	5040	No	3,2
2003882	**12399015600**	200	50	72	20	22	24,0	12	3990	No	3,7
2003993	**12399014600**	250	50	72	18	20	20,0	16	4480	No	5,1
2003994	**12399015800**	250	50	72	20	22	24,0	16	3570	No	5,9
2004081	**12399014800**	315	60	84	18	20	20,0	20	3990	No	8,1
2004082	**12399016000**	315	60	84	20	22	24,0	20	3220	No	9,4

Spare Parts

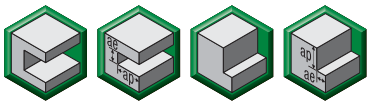


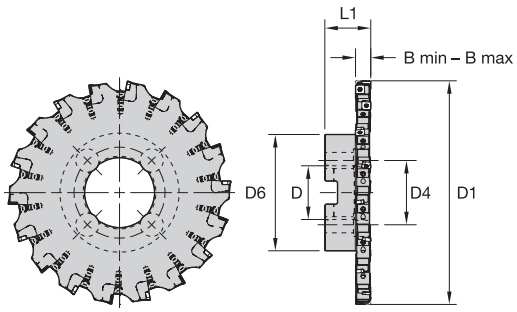






D1	insert screw	Torx driver	STC screw	T-handle hex wrench	clamp wedge	cartridge left-hand	cartridge right-hand	adjusting wedge left-hand	adjusting wedge right-hand
200	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307700**	**12748210700**	**12748210800**	**12748551100**	**12748551200**
200	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307800**	**12748210900**	**12748211000**	**12748551100**	**12748551200**
250	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307700**	**12748210700**	**12748210800**	**12748551100**	**12748551200**
250	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307800**	**12748210900**	**12748211000**	**12748551100**	**12748551200**
315	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307700**	**12748210700**	**12748210800**	**12748551100**	**12748551200**
315	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307800**	**12748210900**	**12748211000**	**12748551100**	**12748551200**





Shell Mount • 12mm

order number	catalogue number	D1	D	D4	D6	B min	B max	L1	Z	max RPM	coolant supply	kg
2003900	**12399114400**	200	40	67	90	18	20	44,8	12	5040	No	3,8
2003901	**12399115600**	200	40	67	90	20	22	46,0	12	3990	No	4,3
2003998	**12399114600**	250	60	102	130	18	20	51,8	16	4480	No	7,2
2003999	**12399115800**	250	60	102	130	20	22	53,0	16	3570	No	7,9
2004096	**12399114800**	315	60	102	130	18	20	51,8	20	3990	No	10,2
2004097	**12399116000**	315	60	102	130	20	22	53,0	20	3220	No	11,3

Spare Parts





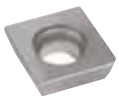




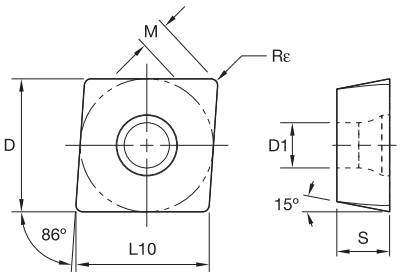
D1	insert screw	Torx driver	STC screw	T-handle hex wrench	clamp wedge	cartridge left-hand	cartridge right-hand	adjusting wedge left-hand	adjusting wedge right-hand
200	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307700**	**12748210700**	**12748210800**	**12748551100**	**12748551200**
200	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307800**	**12748210900**	**12748211000**	**12748551100**	**12748551200**
250	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307700**	**12748210700**	**12748210800**	**12748551100**	**12748551200**
250	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307800**	**12748210900**	**12748211000**	**12748551100**	**12748551200**
315	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307700**	**12748210700**	**12748210800**	**12748551100**	**12748551200**
315	**12748605300**	**12749723200**	**12148574100**	**12148050000**	**12748307800**	**12748210900**	**12748211000**	**12748551100**	**12748551200**

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	MDHW	WP40PM	**MDHW**	**WP40PM**	MDHW	WP40PM
P3–P4	MDHW	WP35CM	**MDHW**	**WP35CM**	MDHW	WP35CM
P5–P6	MDHW	WP35CM	**MDHW**	**WP40PM**	MDHW	WU35PM
M1–M2	MDHW	WP25PM	**MDHW**	**WP25PM**	MDHW	WU35PM
M3	MDHW	WP35CM	**MDHW**	**WP40PM**	MDHW	WU35PM
K1–K2	MDHW	WK15CM	**MDHW**	**WK15CM**	MDHW	WK15CM
K3	MDHW	WK15CM	**MDHW**	**WP35CM**	MDHW	WP35CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	MDHW	WP25PM	**MDHW**	**WU35PM**	MDHW	WU35PM
S3	MDHW	WU35PM	**MDHW**	**WU35PM**	MDHW	WU35PM
S4	MDHW	WP25PM	**MDHW**	**WU35PM**	MDHW	WU35PM
H1	–	–	**–**	**–**	–	–


MDHW


MDHW



● first choice
○ alternate choice

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

MDHW

catalogue number	cutting edges	D	D1	L10	M	S	Rε	WK15CM	WP25PM	WU35PM	WP35CM	WP40PM
MDHW120408	2	12,70	5,50	12,73	2,58	4,76	0,80	5903707	5903723	5903721	5903709	5903705

Recommended Starting Speeds [m/min]

Material Group		WK15CM			WP25PM			WU35PM			WP35CM			WP40PM		
P	0	–	**–**	–	330	**285**	270	260	**230**	215	455	**395**	370	295	**260**	245
	1	–	**–**	–	330	**285**	270	260	**230**	215	455	**395**	370	295	**260**	245
	2	–	**–**	–	275	**240**	200	220	**190**	160	280	**255**	230	250	**215**	180
	3	–	**–**	–	255	**215**	175	200	**170**	140	255	**230**	205	230	**195**	160
	4	–	**–**	–	225	**185**	150	180	**150**	120	190	**175**	160	205	**170**	135
	5	–	**–**	–	185	**170**	150	150	**135**	120	260	**230**	210	170	**155**	135
	6	–	**–**	–	165	**125**	100	130	**100**	80	160	**135**	110	150	**115**	90
M	1	–	**–**	–	205	**180**	165	170	**150**	135	205	**185**	155	195	**170**	155
	2	–	**–**	–	185	**160**	130	155	**130**	110	185	**160**	140	175	**150**	125
	3	–	**–**	–	140	**120**	95	115	**100**	80	145	**130**	115	130	**115**	90
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	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	40	**35**	25	35	**30**	25	–	**–**	–	40	**35**	30
	2	–	**–**	–	40	**35**	25	35	**30**	25	–	**–**	–	40	**35**	30
	3	–	**–**	–	50	**40**	25	45	**35**	25	–	**–**	–	50	**40**	30
	4	–	**–**	–	70	**50**	35	60	**45**	30	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.

Recommended Starting Feeds

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%			
MDHW	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	MDHW

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

WIDIA™ Knowledge Center

EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

Classes to Suit Everyone

Doing things the same way year after year can stall productivity. Continuing education and training in the latest machining practices are necessary to stay competitive.

The Knowledge Center offers several ways to get trained: industry- and application-specific courses, customer onsite programs, and online-based certified metalcutting professional courses. In-person classes include lecture, lab, and machining demonstrations.

Regional Training

The Regional Application Engineering Program is designed to provide a broad base of knowledge for the selection and use of metalcutting tools. Instruction includes lecture-style presentations and video demonstrations. Participants receive notes and text materials, and the video demonstrations reinforce the theories presented in the lecture.

Metalcutting Application Training

The Comprehensive Metalworking Application Course provides a broad base of knowledge for the selection and use of metalcutting tools. Lecture-style presentations and laboratory demonstrations enhance course material through actual cutting tests and reinforce the theories presented in the lecture.

For more information, contact your local WIDIA Authorised Distributor or visit **widia.com/services.**

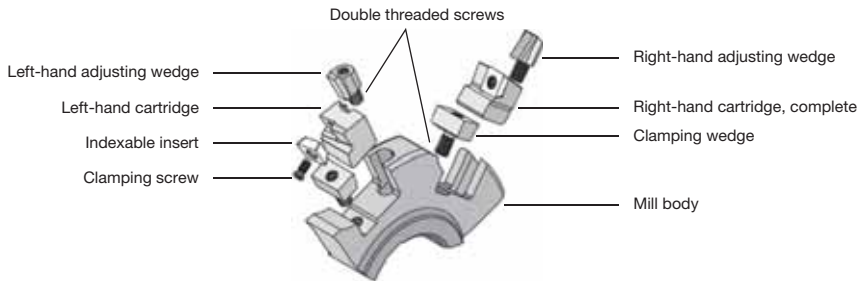
WIDIA™

Assembly and Operating Instructions

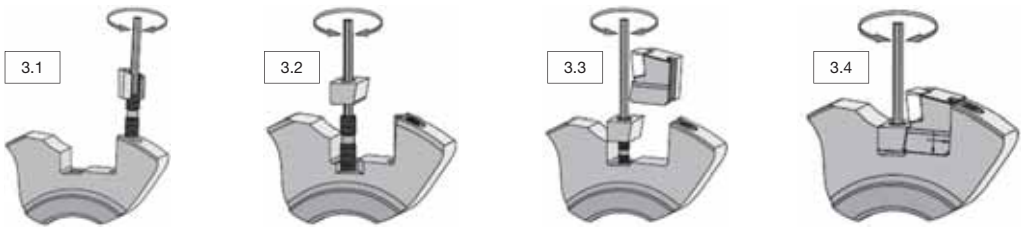
1. General

The runout tolerance of the milling cutter has a decisive effect on the quality of workpieces and the life cycle of tools. Proper tool fitting and the precise axial setting of the milling insert are essential for a successful application and optimum results. One key requirement for assembly and setting work is that all components are clean. Bearing surfaces must be free from grease, and only the threads of indexable insert clamping screws and double threaded screws of clamping and adjusting wedges should be lubricated with copper grease. The indexable inserts should be inserted in the cleaned insert seats so that they are positioned correctly on the bearing surfaces. The indexable insert clamping screws should be tightened with the specified torque.

2. Exploded Diagram of Spare Parts



3. Mounting the Cartridges in the Mill Body



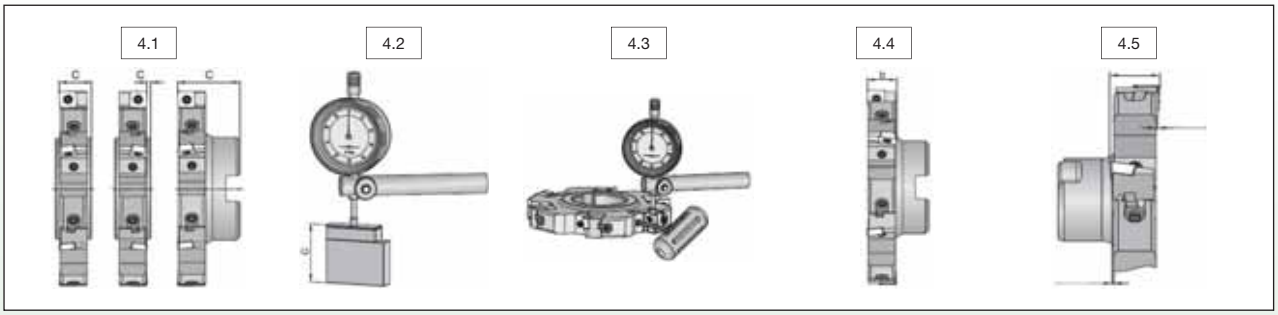
3.1 Turn double threaded screw one turn clockwise in the adjusting wedge. Then insert both parts in the slot in the mill body and turn the double threaded screw clockwise until the adjusting wedge is flush with the milling cutter.

3.2 Turn double threaded screw three turns clockwise in the mill body. Then mount the clamping wedge on the double threaded screw and screw both parts together until the lower edge of the clamping wedge is at the same height as the chip space runout.

3.3 Push the top of the fully assembled cartridge into the mill body using the rear bearing surface of the milling cutter so that the cartridge slot makes contact with the adjusting wedge spring. Ensure a perfect axial/radial surface.

3.4 Secure the correctly positioned cartridge by tightening the clamping wedge with a preset torque of MApre = 1 Nm to set the runout or cutting width.

4. Setting the Runout for Milling Cutters with 2–3 Cutting Edges



4.1 Possible interpretations of the measuring dimension C.

4.2 Set gage to desired measurement C using gage blocks set to 0.

4.3 Set cartridge to ~0,1mm before final measurement. Clamping wedge is tightened with torque MApre = 1 Nm. Then briefly loosen clamping wedge and tighten again.

4.4 Set cartridge to 0,02mm before final measurement. Then briefly loosen clamping wedge so that the contact surfaces can level out. Tighten clamping.

4.4 Wedge again with torque MApre = 1 Nm.

4.5 Adjust cartridge to final measurement. Tighten clamping wedge with torque MA = 4 Nm. Check runout of the fully adjusted milling cutter.

5. Setting the Runout for Milling Cutters with 3 Cutting Edges

The cutting widths for milling cutters with three cutting edges are set using purpose-designed optical tool presetting equipment. Note that the projection of the cartridges from the mill body must be almost exactly the same on both sides. The sequence of steps required for setting the cartridge is identical to those for tools with two cutting edges.

ATTENTION:

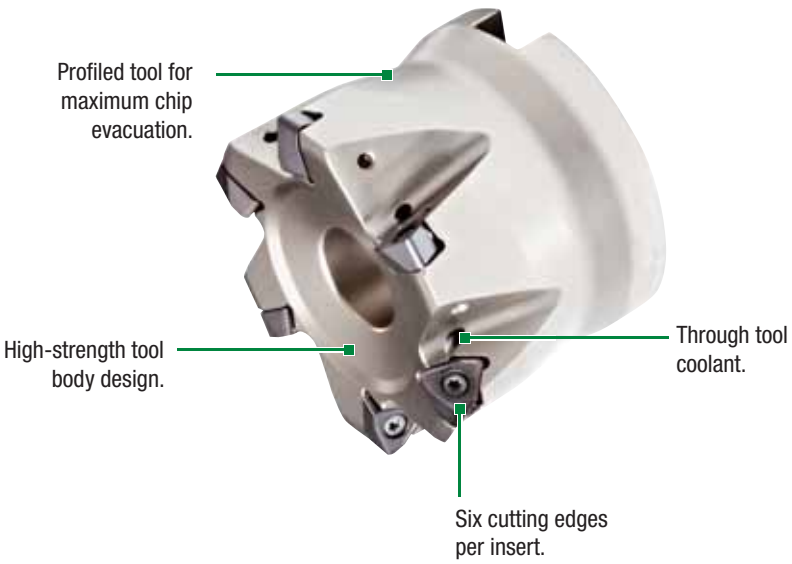
At each tool adjustment, the body, cartridges, indexable inserts, and spare parts must be checked and replaced if necessary. Before each tool use, the clamping and double threaded screws must be tightened with the specified torque. The tools must only be used in accordance with their function. We accept no liability for their improper use. Changes of any kind and/or printing errors are not valid grounds for claims.

Indexable Milling • Copy Mills

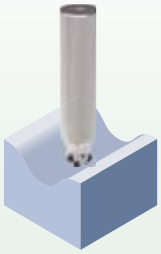
M370

Designed for high feed rate productivity, M370 Series provides the latest insert technology with outstanding performance and reliability. Its double-sided concept and six cutting edges provide security and optimal metal removal with an efficient cost per edge.

- Double-sided design offers six cutting edges per insert.
- Extremely high metal removal rates.
- First choice for high-feed roughing applications.



Copy Mills

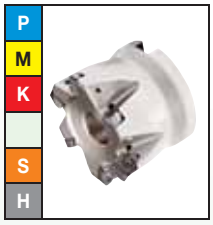


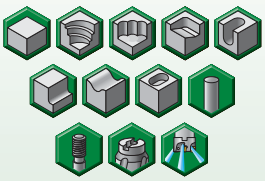
M370™

Max depth of cut: up to 2mm

Indexes per insert: 6
Diameter: 25–125mm

Pages: M4–M16



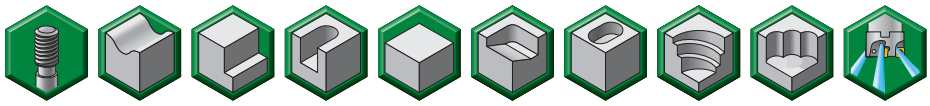


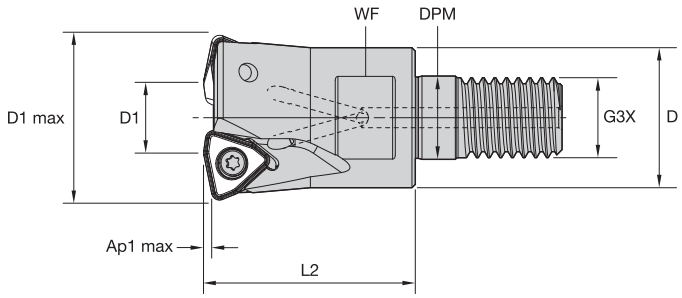
Insert Offering

8mm iC Insert WOEJ0804
Up to 1,3mm Ap max
Diameter range 25–80mm

12mm iC Insert WOEJ1207
Up to 2mm Ap max
Diameter range 42–125mm

- Double-sided, six cutting edges.
- Highest metal removal rates.
- First choice for roughing applications.





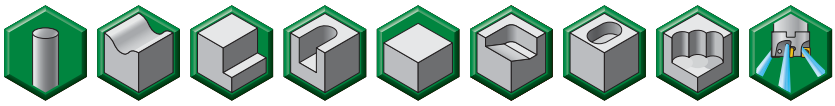
Screw-On End Mills

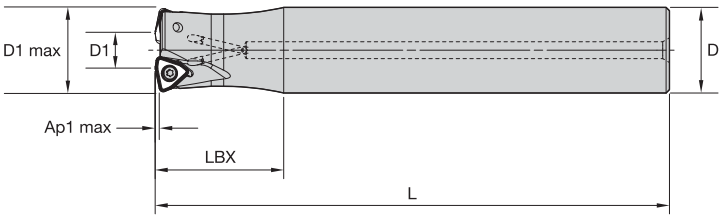
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4056186	**M370D025Z02M12WO08**	25	11	21	12,5	M12	35	17	1,3	2	2.1°	46000	Yes	0,09
4170918	**M370D025Z03M12WO08**	25	11	21	12,5	M12	35	17	1,3	3	2.1°	46000	Yes	0,09
4056187	**M370D032Z04M16WO08**	32	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

Spare Parts

D1 max	insert screw	Nm	Torx driver
25	**MS2219**	1,8	**DT9IP**
32	**MS2219**	1,8	**DT9IP**
42	**MS2219**	1,8	**DT9IP**

- Double-sided, six cutting edges.
- Highest metal removal rates.
- First choice for roughing applications.





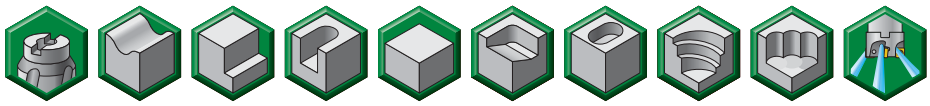
Cylindrical End Mills

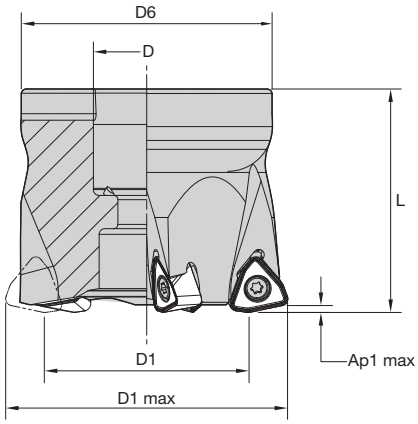
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4056189	**M370D025Z03A25WO08L150**	25	11	25	150	40	1,3	3	46000	Yes	0,50
4008281	**M370D025Z02A25WO08L200**	25	11	25	200	50	1,3	2	46000	Yes	0,68
4170919	**M370D025Z03A25WO08L200**	25	11	25	200	40	1,3	3	46000	Yes	0,69
4170920	**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	0,84

Spare Parts

D1 max	 insert screw	 Nm	 wrench
25	**MS2219**	1,8	**DT9IP**
28	**MS2219**	1,8	**DT9IP**
32	**MS2219**	1,8	**DT9IP**

- Double-sided, six cutting edges.
- Highest metal removal rates.
- First choice for roughing applications.





Shell Mills

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

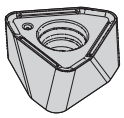
Spare Parts

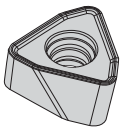
D1 max	 insert screw	 Nm	 Torx Plus driver	 socket-head cap screw	 socket-head cap screw with coolant groove
40	**MS2219**	1,8	**DT9IP**	**125.825**	**MS1294CG**
50	**MS2219**	1,8	**DT9IP**	**12146120500**	**MS1234CG**
52	**MS2219**	1,8	**DT9IP**	**12146120500**	**MS1234CG**
63	**MS2219**	1,8	**DT9IP**	**12146120500**	**MS1234CG**
66	**MS2219**	1,8	**DT9IP**	**MS2038**	**MS2038CG**
80	**MS2219**	1,8	**DT9IP**	**MS2038**	**MS2038CG**

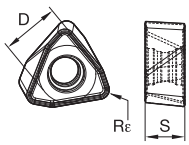
NOTE: Socket-head cap screw with coolant groove must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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	**–**	**–**	–	–


WOEJ-MM


WOEJ-MH



- -MM geometry provides lower cutting forces. First choice for steel, stainless steel, and high-temp alloys.
- -MH geometry is the first choice for high-strength steel and cast iron.

● first choice
○ alternate choice

		TN6520	TN6525	TN7535	WK15CM	WP25PM	WS30PM	WP40PM
P		○	●	●		●		●
M			○	○		●	○	●
K		●	○	○	●	○		
N								
S						●	●	○
H			○			○		

WOEJ-MM

catalogue number	cutting edges	D	S	Rε	TN6520	TN6525	TN7535	WK15CM	WP25PM	WS30PM	WP40PM
WOEJ080412SRMM	6	7,79	4,70	1,22	-	4113892	4113916	-	5564597	5520248	5544753

WOEJ-MH

catalogue number	cutting edges	D	S	Rε	TN6520	TN6525	TN7535	WK15CM	WP25PM	WS30PM	WP40PM
WOEJ080412SRMH	6	7,79	4,75	1,22	4136480	4052411	4068517	5427443	5564596	-	5544752

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN7535			WK15CM		
P	1	–	–	–	410	**320**	280	545	**475**	445	–	–	–
	2	–	–	–	320	**250**	215	335	**305**	275	–	–	–
	3	–	–	–	280	**215**	185	305	**275**	245	–	–	–
	4	–	–	–	235	**170**	145	230	**210**	190	–	–	–
	5	–	–	–	310	**235**	200	310	**275**	250	–	–	–
	6	–	–	–	205	**160**	130	190	**160**	130	–	–	–
M	1	–	–	–	190	**120**	80	245	**220**	185	–	–	–
	2	–	–	–	120	**80**	50	220	**190**	170	–	–	–
	3	–	–	–	125	**80**	55	175	**155**	140	–	–	–
K	1	450	**320**	230	275	**245**	220	355	**320**	290	505	**460**	410
	2	390	**250**	190	215	**190**	180	280	**250**	230	400	**355**	330
	3	300	**230**	160	180	**160**	145	235	**210**	190	335	**300**	275
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WP25PM			WS30PM			WP40PM		
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
	6	200	**150**	120	–	**–**	–	180	**140**	110
M	1	245	**215**	200	270	**240**	220	235	**205**	185
	2	220	**190**	155	245	**215**	175	210	**180**	150
	3	170	**145**	115	185	**160**	125	155	**140**	110
K	1	275	**245**	220	–	**–**	–	–	**–**	–
	2	215	**190**	180	–	**–**	–	–	**–**	–
	3	180	**160**	145	–	**–**	–	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	50	**40**	30	55	**50**	35	50	**40**	35
	2	50	**40**	30	55	**50**	35	50	**40**	35
	3	60	**50**	30	65	**55**	35	60	**50**	35
	4	85	**60**	40	100	**70**	50	80	**60**	40
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.

Recommended Starting Feeds

■ Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

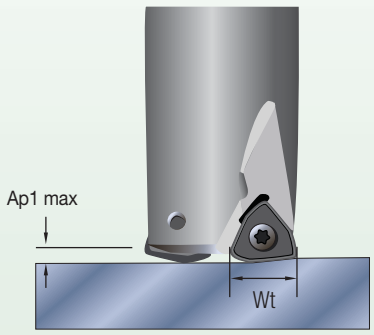
For Plunging Applications

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

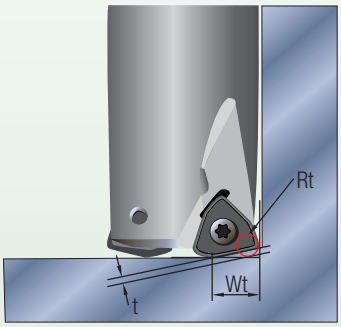
NOTE: Use "Light Machining" value as starting feed rate.

Applying High-Feed Tools

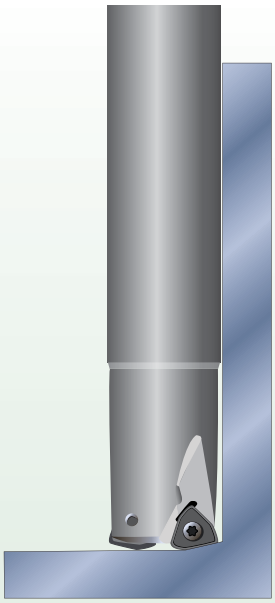
The high-feed concept bases its strategy on small depth of cut and higher fz values, which results in a higher MRR and productivity with low radial forces.



Small Ap1 values and higher feed rates 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.



Recommended when long overhang is necessary due to lower radial forces. Maximum L/D ratio of 10 x D.

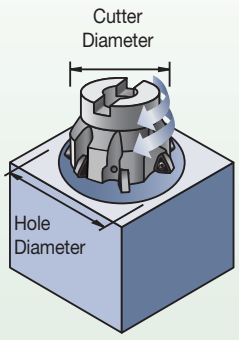
General Programming Information for Applying M370

L/D ratio	starting Ap1	starting fz range
<3	0,9mm	1–1,3mm
>3–<5	0,6mm	1–1,3mm
>5–<7	0,4mm	0,6–1mm

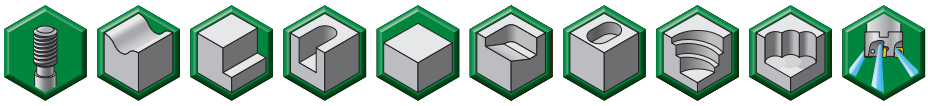
Rt	t	Wt
2,5mm	1mm	7,5mm

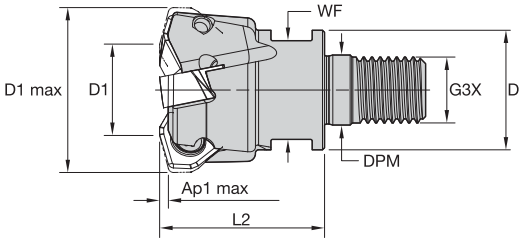
■ Maximum Linear Ramping and Helical Interpolation from Solid • Metric

cutter diameter	max linear ramp angle (straight line)	min hole diameter	max hole diameter	Ap1 max per revolution
25	3,1°	30,2	49,5	1,25
28	2,6°	36,1	55,5	1,25
32	2,9°	44,1	63,5	1,25
40	1,6°	60	79,5	1,25
42	1,5°	64	83,5	1,25
50	1,3°	80	99,5	1,25
52	1,2°	84	103,5	1,25
63	1°	106	125,5	1,25
66	1°	112	131,5	1,25
80	0,8°	140	155,5	1,25



- Double-sided, six cutting edges.
- Highest metal removal rates.
- First choice for roughing applications.





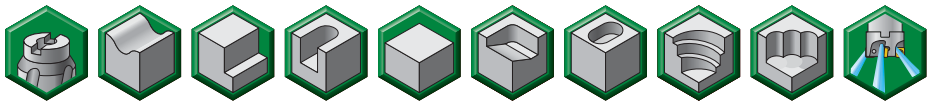
Screw-On End Mills

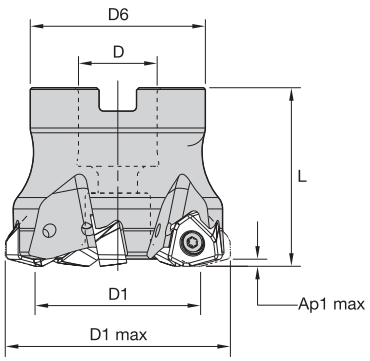
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5338912	**M370D42Z03M16WO12**	42	25	29	17,0	M16	40	24	2,0	3	5.1°	21310	Yes	0,22

Spare Parts

D1 max	 insert screw	 Nm	 Torx driver
42	**MS2085**	4,0	**DT15IP**

- Double-sided, six cutting edges.
- Highest metal removal rates.
- First choice for roughing applications.





Shell Mills

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

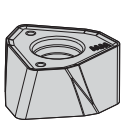
Spare Parts

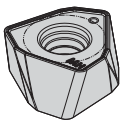
D1 max	 insert screw	 Nm	 Torx Plus driver	 socket-head cap screw	 socket-head cap screw with coolant groove	 coolant lock screw	 coolant lock screw assembly
50	**MS2085**	4,0	**DT15IP**	**12146120500**	**MS1234CG**	–	–
52	**MS2085**	4,0	**DT15IP**	**12146120500**	**MS1234CG**	–	–
63	**MS2085**	4,0	**DT15IP**	**125.025**	**MS1234CG**	–	–
66	**MS2085**	4,0	**DT15IP**	**125.230**	**MS2038CG**	–	–
80	**MS2085**	4,0	**DT15IP**	**125.230**	**MS2038CG**	–	–
100	**MS2085**	4,0	**DT15IP**	–	–	**KLS32M**	**MS2195C**
125	**MS2085**	4,0	**DT15IP**	–	–	**KLS40M**	**MS2187C**

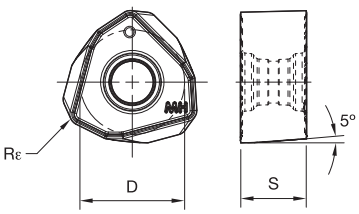
NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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**	–	–


WOEJ-MM


WOEJ-MH



- -MM geometry provides lower cutting forces. First choice for steel, stainless steel, and high-temp alloys.
- -MH geometry is the first choice for high-strength steel and cast iron.
- -MR geometry is designed for heavy-duty steel and cast iron applications.

● first choice
○ alternate choice

		WK15CM	WP20CM	WP25PM	WU35PM	WP35CM	WS30PM	WP40PM
P			●	●	●	●		●
M			○	●	●	○	○	●
K		●	○	○		○		
N								
S				●	●		●	○
H			○	○				

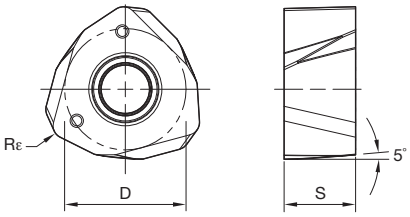
WOEJ-MM

catalogue number	cutting edges	D	S	Rε	WK15CM	WP20CM	WP25PM	WU35PM	WP35CM	WS30PM	WP40PM
WOEJ120712SRMM	6	12,00	7,30	1,27	-	5419790	5419648	5419649	5419791	5520249	5542346

WOEJ-MH

catalogue number	cutting edges	D	S	Rε	WK15CM	WP20CM	WP25PM	WU35PM	WP35CM	WS30PM	WP40PM
WOEJ120712SRMH	6	12,00	7,30	1,27	5338860	5338861	5338818	5338819	5338862	-	5542347


WOEJ-MR



● first choice
○ alternate choice

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

■ WOEJ-MR

catalogue number	cutting edges	D	S	Rε	WK15CM	WP20CM	WP25PM	WU35PM	WP35CM	WS30PM	WP40PM
WOEJ120712SRMR	6	12,00	7,30	1,27	-	-	5698343	-	-	-	5698342

Recommended Starting Speeds

■ Recommended Starting Speeds [m/min]

Material Group		WK15CM			WP20CM			WP25PM			WU35PM		
P	1	–	**–**	–	660	**580**	540	395	**340**	325	310	**275**	260
	2	–	**–**	–	410	**370**	330	330	**290**	240	265	**230**	190
	3	–	**–**	–	370	**330**	305	305	**260**	210	240	**205**	170
	4	–	**–**	–	275	**260**	230	270	**220**	180	215	**180**	145
	5	–	**–**	–	330	**300**	275	220	**205**	180	180	**160**	145
	6	–	**–**	–	230	**205**	175	200	**150**	120	155	**120**	95
M	1	–	**–**	–	270	**240**	210	245	**215**	200	205	**180**	160
	2	–	**–**	–	245	**210**	190	220	**190**	155	185	**155**	130
	3	–	**–**	–	190	**175**	150	170	**145**	115	140	**120**	95
K	1	505	**460**	410	430	**390**	355	275	**245**	220	–	**–**	–
	2	400	**355**	330	340	**305**	280	215	**190**	180	–	**–**	–
	3	335	**300**	275	290	**260**	240	180	**160**	145	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**40**	30	40	**35**	30
	2	–	**–**	–	–	**–**	–	50	**40**	30	40	**35**	30
	3	–	**–**	–	–	**–**	–	60	**50**	30	55	**40**	30
	4	–	**–**	–	–	**–**	–	85	**60**	40	70	**55**	35
H	1	–	**–**	–	170	**140**	115	145	**110**	85	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		WP35CM			WS30PM			WP40PM		
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
	6	190	**160**	130	–	**–**	–	180	**140**	110
M	1	245	**220**	185	270	**240**	220	235	**205**	185
	2	220	**190**	170	245	**215**	175	210	**180**	150
	3	175	**155**	140	185	**160**	125	155	**140**	110
K	1	355	**320**	290	–	**–**	–	–	**–**	–
	2	280	**250**	230	–	**–**	–	–	**–**	–
	3	235	**210**	190	–	**–**	–	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	55	**50**	35	50	**40**	35
	2	–	**–**	–	55	**50**	35	50	**40**	35
	3	–	**–**	–	65	**55**	35	60	**50**	35
	4	80	**60**	40	100	**70**	50	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.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

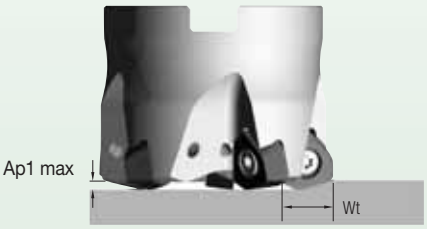
For All Other Applications

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

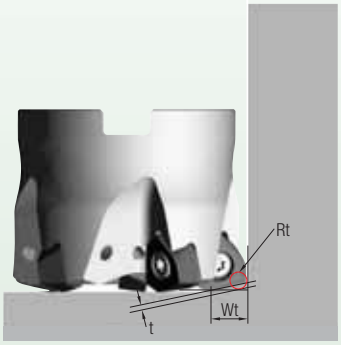
NOTE: Use "Light Machining" value as starting feed rate.

Applying High-Feed Tools

The high-feed concept bases its strategy on small depth of cut and higher fz values, which results in a higher MRR and productivity with low radial forces.



Small Ap1 values and higher feed rates 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.

Recommended when long overhang is necessary due to lower radial forces. Maximum L/D ratio of 10 x D.

General Programming Information for Applying M370

	CAM programming information		
	Rt	**Wt**	**t**
mm value	3,2	9	1,4

■ Maximum Linear Ramping and Helical Interpolation from Solid • Metric

diameter	max ramp angle	max ramp angle for 360° helical interpolation	max plunge depth	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
42	5,1°	1,44°	1,66	57,36	65,29	84
50	3,7°	1,09°	1,66	73,07	81,24	100
52	3,5°	1,03°	1,66	77,03	85,24	104
63	2,6°	0,78°	1,66	98,88	107,20	126
66	2,4°	0,74°	1,66	104,85	113,20	132
80	1,8°	0,57°	1,66	132,77	141,18	160
100	1,3°	0,43°	1,66	172,70	181,16	200
125	1,0°	0,33°	1,66	222,66	231,15	250

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WIDIA™

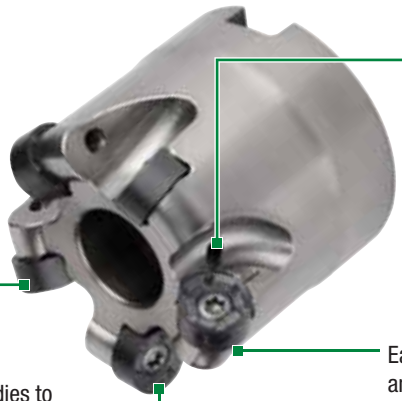
Double-Sided Round Insert •

M200™ Series

Revolutionary double-sided round insert, capable of running in multiple types of milling operations and workpiece materials, increases customer's productivity with the most efficient cost per edge.

M200

- Up to 12 cutting edges per insert.
- Effective anti-rotation feature.
- Able to apply in all type of materials and milling applications.
- Latest WIDIA™ Victory™ grades offered.



Screw-on, end mill, and shell mill cutters with internal coolant.

Higher clearance in bodies to permit pocketing, profiling, and 5-axis machining.

Easy-to-use and unique anti-rotation feature for excellent stability for higher feed rates and cutting forces.

Three different insert sizes and three insert topography styles with the new WIDIA Victory milling grades cover any type of component and application.

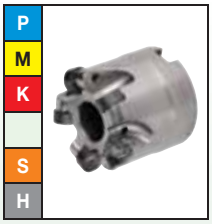
Copy Mills

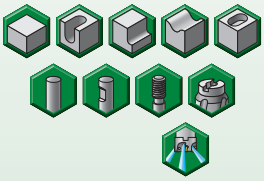
M200™

Max depth of cut: up to 5mm

Indexes per insert: up to 12
Diameter: 25–125mm

Pages: M20–M39





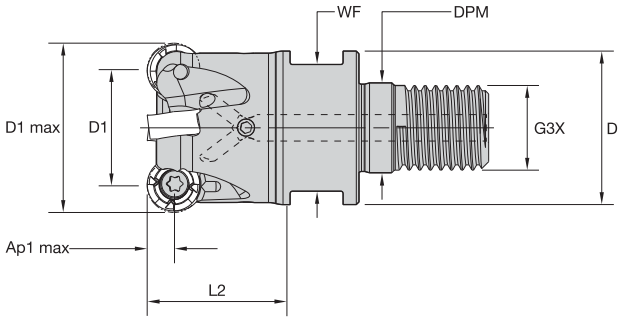
Insert Offering

M200 iC 10
10mm iC insert
8 cutting edges

M200 iC 12
12mm iC insert
12 cutting edges

M200 iC 16
16mm iC insert
12 cutting edges

- Double-sided, eight cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.



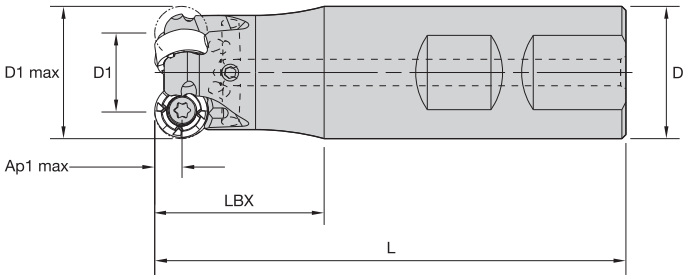
Screw-On End Mills

order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
5210273	**M200D25Z03M12RN10**	25	15	21	12,5	M12	32	17	5,0	3	54700	Yes	0,08
5210274	**M200D32Z04M16RN10**	32	22	29	17,0	M16	40	24	5,0	4	48300	Yes	0,18
5210275	**M200D35Z05M16RN10**	35	24	29	17,0	M16	40	24	5,0	5	46200	Yes	0,20
5210276	**M200D42Z06M16RN10**	42	32	29	17,0	M16	40	24	5,0	6	42200	Yes	0,24

Spare Parts

insert screw	Nm	Torx driver
191.848	2,0	**170.025**

- Double-sided, eight cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.



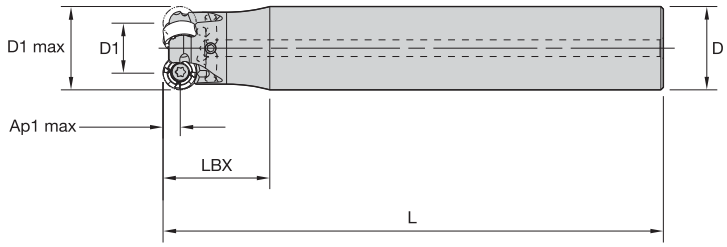
Weldon Shanks

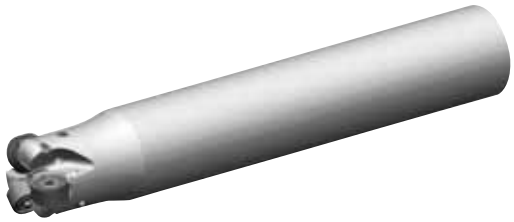
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
5210277	**M200D25Z03B25RN10**	25	15	25	89	40	5,0	3	54700	Yes	0,27
5210278	**M200D32Z04B32RN10**	32	22	32	101	40	5,0	4	48300	Yes	0,52

Spare Parts

insert screw	Nm	Torx driver
191.848	2,0	**170.025**

- Double-sided, eight cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.





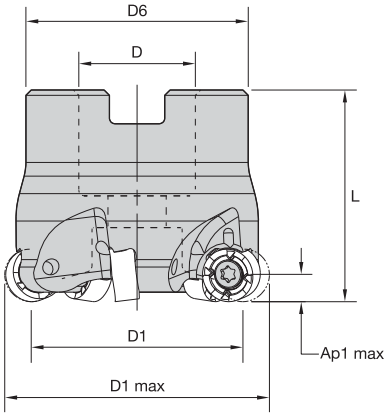
Cylindrical End Mills

order number	catalogue number	D1 max	D1	D	L	LBX	L2	Ap1 max	Z	max RPM	coolant supply	kg
5210279	**M200D25Z03A25RN10L150**	25	15	25	150	32	32	5,0	3	54700	Yes	0,50
5210300	**M200D25Z03A25RN10L200**	25	15	25	200	32	32	5,0	3	54700	Yes	0,69
5210301	**M200D25Z03A32RN10L250**	25	15	32	250	32	32	5,0	3	54700	Yes	1,41
5210302	**M200D28Z03A25RN10L200**	28	18	25	200	40	40	5,0	3	51600	Yes	0,70
5210303	**M200D32Z04A32RN10L150**	32	22	32	150	40	40	5,0	4	48300	Yes	0,83
5210304	**M200D32Z03A32RN10L200**	32	22	32	200	40	40	5,0	3	48300	Yes	1,14

Spare Parts

 insert screw	 Nm	 Torx driver
191.848	2,0	**170.025**

- Double-sided, eight cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.



Shell Mills

order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5210305	**M200D40Z04RN10**	40	30	16	38	40	5,0	4	43200	Yes	0,23
5210306	**M200D40Z06RN10**	40	30	16	38	40	5,0	6	43200	Yes	0,24
5210307	**M200D50Z05RN10**	50	40	22	42	40	5,0	5	38600	Yes	0,32
5210308	**M200D50Z06RN10**	50	40	22	42	40	5,0	6	38600	Yes	0,32
5210309	**M200D52Z06RN10**	52	42	22	49	50	5,0	6	37900	Yes	0,52

Spare Parts

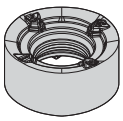
D1 max	 insert screw	 Nm	 wrench	 socket-head cap screw	 socket-head cap screw with coolant groove
40	**191.848**	2,0	**170.025**	**MS1294**	**MS1294CG**
50	**191.848**	2,0	**170.025**	**MS1234**	**MS1234CG**
52	**191.848**	2,0	**170.025**	**MS1242**	**MS1242CG**

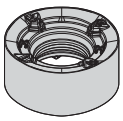
NOTE: Socket-head cap screw and socket-head cap screw with coolant groove must be ordered separately.

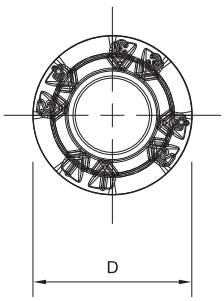
Insert Selection Guide

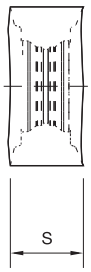
Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	ML	WP25PM	**MM**	**WP40PM**	MM	WP40PM
P3–P4	ML	WP25PM	**MM**	**WP25PM**	MH	WP40PM
P5–P6	ML	WP35CM	**MM**	**WP35CM**	MH	WP35CM
M1–M2	ML	WP25PM	**ML**	**WU35PM**	MM	WU35PM
M3	ML	WP25PM	**MM**	**WU35PM**	MM	WU35PM
K1–K2	MH	WK15CM	**MH**	**WK15CM**	MH	WP20CM
K3	MH	WK15CM	**MH**	**WK15CM**	MH	WP25PM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
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**	–	–

iC10 • Inserts • RN.J10…


RNGJ-ML


RNGJ-MM





- -ML geometry is the first choice for stainless steel and high-temp alloys.
- -MM geometry is for general purpose, especially for steel.

● first choice
○ alternate choice

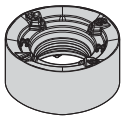
P			●	●		●	●	●
M			○	●	○	●	○	●
K		●	○	○			○	
N								
S				●	●	●		○
H			○	○				

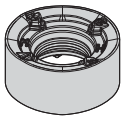
RNGJ-ML

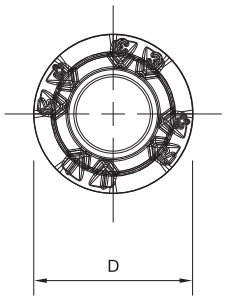
catalogue number	number of indexes	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNGJ10T3M0EML	8	10,00	4,76	▪	▪	5274456	5520352	5274457	5274455	▪

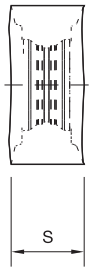
RNGJ-MM

catalogue number	number of indexes	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNGJ10T3M0SMM	8	10,00	4,76	▪	▪	5274511	5520353	5274512	▪	▪


RNGJ-MM


RNPJ-MH





- -MM geometry is for general purpose, especially for steel.
- -MH geometry is the first choice for heavy applications, cast iron, and high-strength steel.

● first choice
○ alternate choice

		WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
P			●	●		●	●	●
M			○	●	○	●	○	●
K	●	○	○				○	
N								
S				●	●	●		○
H			○	○				

■ RNPJ-MM

catalogue number	number of indexes	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNPJ10T3M0SMM	8	10,00	4,76	-	5276198	5276197	-	-	5276196	5542327

■ RNPJ-MH

catalogue number	number of indexes	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNPJ10T3M0SMH	8	10,00	4,76	5276243	5276241	5276240	-	5476633	5276199	5542328

Recommended Starting Speeds [m/min]

Material Group		WK15CM			WP20CM			WP25PM			WS30PM		
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	270	**240**	220
	2	–	–	–	245	**210**	190	220	**190**	155	245	**215**	175
	3	–	–	–	190	**175**	150	170	**145**	115	185	**160**	125
K	1	505	**460**	410	430	**390**	355	275	**245**	220	–	–	–
	2	400	**355**	330	340	**305**	280	215	**190**	180	–	–	–
	3	335	**300**	275	290	**260**	240	180	**160**	145	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**40**	30	55	**50**	35
	2	–	–	–	–	–	–	50	**40**	30	55	**50**	35
	3	–	–	–	–	–	–	60	**50**	30	65	**55**	35
	4	–	–	–	–	–	–	85	**60**	40	100	**70**	50
H	1	–	–	–	170	**140**	115	145	**110**	85	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		WU35PM			WP35CM			WP40PM		
P	1	310	**275**	260	545	**475**	445	355	**310**	295
	2	265	**230**	190	335	**305**	275	300	**260**	215
	3	240	**205**	170	305	**275**	245	275	**235**	190
	4	215	**180**	145	230	**210**	190	245	**205**	160
	5	180	**160**	145	310	**275**	250	205	**185**	160
	6	155	**120**	95	190	**160**	130	180	**140**	110
M	1	205	**180**	160	245	**220**	185	235	**205**	185
	2	185	**155**	130	220	**190**	170	210	**180**	150
	3	140	**120**	95	175	**155**	140	155	**140**	110
K	1	–	–	–	355	**320**	290	–	–	–
	2	–	–	–	280	**250**	230	–	–	–
	3	–	–	–	235	**210**	190	–	–	–
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
S	1	40	**35**	30	–	–	–	50	**40**	35
	2	40	**35**	30	–	–	–	50	**40**	35
	3	55	**40**	30	–	–	–	60	**50**	35
	4	70	**55**	35	80	**60**	40	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.

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%			
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%			
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)

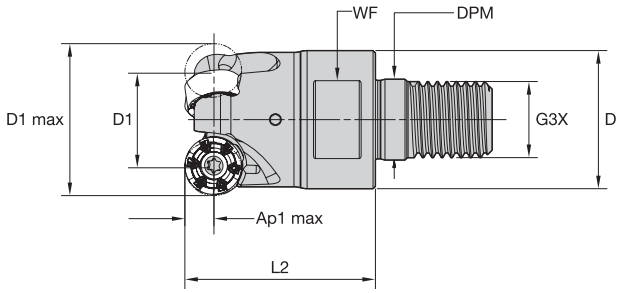
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ML	0,20	**0,67**	1,21	0,14	**0,48**	0,87	0,11	**0,36**	0,65	0,09	**0,31**	0,56	0,09	**0,29**	0,52	ML
MM	0,43	**0,77**	1,39	0,31	**0,55**	1,00	0,23	**0,41**	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%			
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.

- Double-sided, 12 cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.



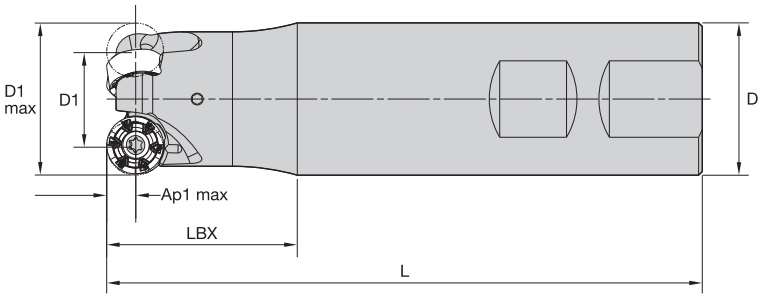
Screw-On End Mills

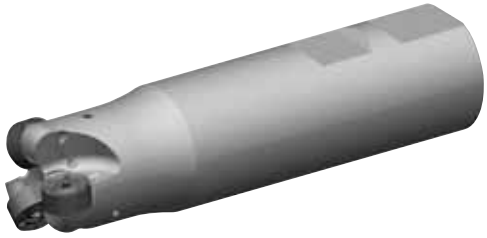
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
4147560	**M200D32Z03M16RN12**	32	20	29	17,0	M16	40	24	3,0	3	39160	Yes	0,18
4147561	**M200D35Z03M16RN12**	35	23	29	17,0	M16	40	24	3,0	3	37440	Yes	0,19
4147562	**M200D42Z04M16RN12**	42	30	29	17,0	M16	40	24	3,0	4	34180	Yes	0,24

Spare Parts

D1 max	insert screw	Nm	Torx driver
32	**193.492**	4,0	**170.025**
35	**193.492**	4,0	**170.025**
42	**193.492**	4,0	**170.025**

- Double-sided, 12 cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.





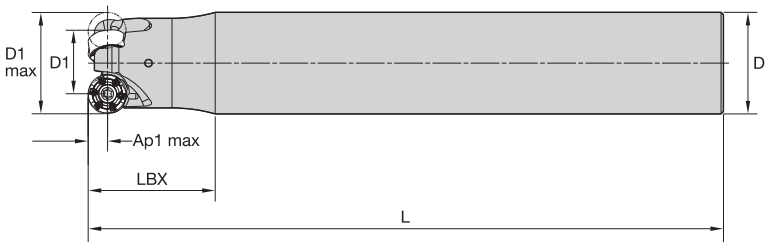
Weldon Shanks

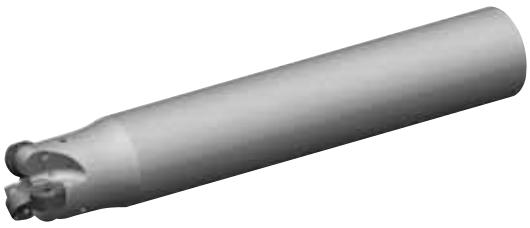
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4147564	**M200D32Z03B32RN12**	32	20	32	125	40	3,0	3	39160	Yes	0,65

Spare Parts

D1 max	insert screw	Nm	Torx driver
32	**193.492**	4,0	**170.025**

- Double-sided, 12 cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.





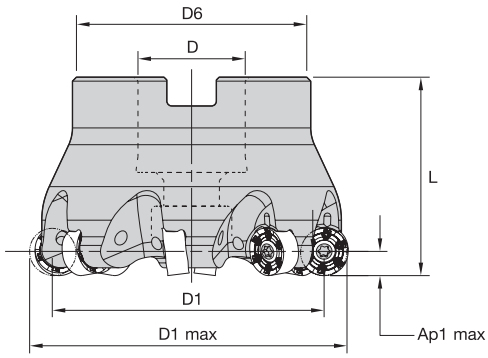
Cylindrical End Mills

order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4147566	**M200D32Z03A32RN12L200**	32	20	32	200	40	3,0	3	39160	Yes	1,10
4147567	**M200D32Z02A32RN12L250**	32	20	32	250	40	3,0	2	39160	Yes	1,41

Spare Parts

D1 max	insert screw	Nm	Torx driver
32	**193.492**	4,0	**170.025**

- Double-sided, 12 cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.



Shell Mills

order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4147568	**M200D40Z04RN12**	40	28	16	38	40	3,0	4	35020	Yes	0,22
4147569	**M200D50Z04RN12**	50	38	22	42	40	3,0	4	31330	Yes	0,30
4147570	**M200D50Z05RN12**	50	38	22	42	40	3,0	5	31330	Yes	0,29
4147571	**M200D52Z05RN12**	52	40	22	49	50	3,0	5	30720	Yes	0,49
4147572	**M200D63Z05RN12**	63	51	22	49	50	3,0	5	27910	Yes	0,63
4147573	**M200D63Z07RN12**	63	51	22	49	50	3,0	7	27910	Yes	0,63
4147574	**M200D66Z07RN12**	66	54	27	60	50	3,0	7	27260	Yes	0,82
4147575	**M200D80Z06RN12**	80	68	27	60	50	3,0	6	24760	Yes	1,02
4147576	**M200D80Z08RN12**	80	68	27	60	50	3,0	8	24760	Yes	1,02
4147577	**M200D100Z07RN12**	100	88	32	78	50	3,0	7	22150	Yes	1,45
4147578	**M200D100Z09RN12**	100	88	32	78	50	3,0	9	22150	Yes	1,41

Spare Parts

D1 max	 insert screw	 Nm	wrench	 low-head cap screw	 socket-head cap screw	 socket-head cap screw with coolant groove	 coolant lock screw	 coolant lock screw assembly
40	**193.492**	4,0	**170.025**	–	**MS1294**	**MS1294CG**	–	–
50	**193.492**	4,0	**170.025**	**MS1336**	–	**MS2072CG**	–	–
52	**193.492**	4,0	**170.025**	–	**MS1242**	**MS1242CG**	–	–
63	**193.492**	4,0	**170.025**	–	**MS1242**	**MS1242CG**	–	–
66	**193.492**	4,0	**170.025**	–	**MS2038**	**MS2038CG**	–	–
80	**193.492**	4,0	**170.025**	–	**MS2038**	**MS2038CG**	–	–
100	**193.492**	4,0	**170.025**	–	–	–	**KLS32M**	**MS2195C**

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

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	WK15PM	**MH**	**WK15PM**	MH	WP25PM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
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**	–	–

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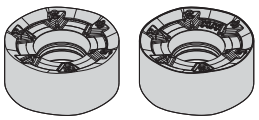
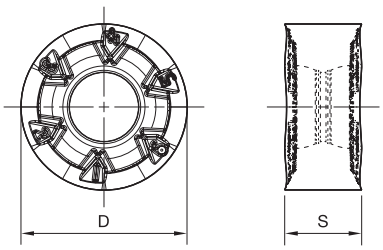

RNGJ-ML RNGJ-MM



- -ML geometry is the first choice for stainless steel and high-temp alloys.
- -MM geometry is for general purpose, especially for steel.

● first choice
○ alternate choice

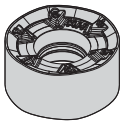
	WK15PM	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
P			●	●		●	●	●
M			○	●	○	●	○	●
K	●	●	○	○			○	
N								
S				●	●	●		○
H			○	○				

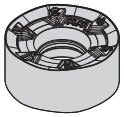
RNGJ-ML

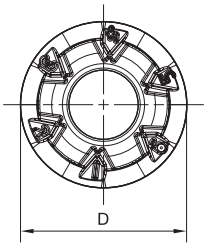
catalogue number	cutting edges	D	S	WK15PM	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNGJ1204M0EML	12	12,00	4,75	-	-	-	5123863	5520350	5123864	5123865	-

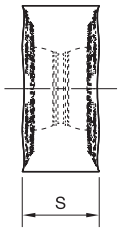
RNGJ-MM

catalogue number	cutting edges	D	S	WK15PM	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNGJ1204M0SMM	12	12,00	4,75	5123866	-	-	5123867	5520351	5123868	5123869	-


RNGJ-MH
RNPJ-MH


RNPJ-MM





- -MM geometry is for general purpose, especially for steel.
- -MH geometry is the first choice for heavy applications, cast iron, and high-strength steel.

● first choice
○ alternate choice

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

■ RNGJ-MH

catalogue number	cutting edges	D	S	WK15PM	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNGJ1204M0SMH	12	12,00	4,75	5123900	-	-	5123901	-	5123902	5123903	-

■ RNPJ-MM

catalogue number	cutting edges	D	S	WK15PM	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNPJ1204M0SMM	12	12,00	4,75	-	-	5276362	5276361	-	5476634	5276360	5542329

■ RNPJ-MH

catalogue number	cutting edges	D	S	WK15PM	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNPJ1204M0SMH	12	12,00	4,75	-	5276366	5276365	5276364	-	5476635	5276363	5542340

Recommended Starting Speeds [m/min]

Material Group		WK15PM			WK15CM			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	325	**295**	260	505	**460**	410	430	**390**	355	275	**245**	220
	2	250	**230**	210	400	**355**	330	340	**305**	280	215	**190**	180
	3	210	**190**	175	335	**300**	275	290	**260**	240	180	**160**	145
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
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		WS30PM			WU35PM			WP35CM			WP40PM		
P	1	–	–	–	310	**275**	260	545	**475**	445	355	**310**	295
	2	–	–	–	265	**230**	190	335	**305**	275	300	**260**	215
	3	–	–	–	240	**205**	170	305	**275**	245	275	**235**	190
	4	–	–	–	215	**180**	145	230	**210**	190	245	**205**	160
	5	–	–	–	180	**160**	145	310	**275**	250	205	**185**	160
	6	–	–	–	155	**120**	95	190	**160**	130	180	**140**	110
M	1	270	**240**	220	205	**180**	160	245	**220**	185	235	**205**	185
	2	245	**215**	175	185	**155**	130	220	**190**	170	210	**180**	150
	3	185	**160**	125	140	**120**	95	175	**155**	140	155	**140**	110
K	1	–	–	–	–	–	–	355	**320**	290	–	–	–
	2	–	–	–	–	–	–	280	**250**	230	–	–	–
	3	–	–	–	–	–	–	235	**210**	190	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	55	**50**	35	40	**35**	30	–	–	–	50	**40**	35
	2	55	**50**	35	40	**35**	30	–	–	–	50	**40**	35
	3	65	**55**	35	55	**40**	30	–	–	–	60	**50**	35
	4	100	**70**	50	70	**55**	35	80	**60**	40	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.

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%			
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%			
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)

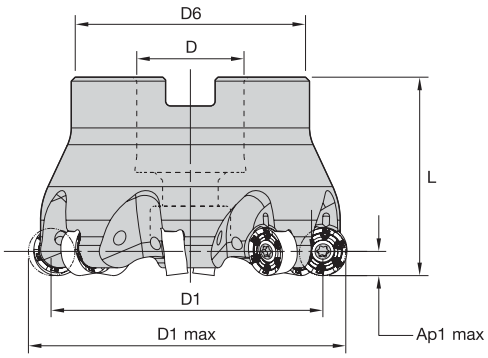
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ML	0,18	**0,27**	0,49	0,13	**0,19**	0,35	0,10	**0,15**	0,26	0,09	**0,13**	0,23	0,08	**0,12**	0,21	ML
MM	0,43	**0,77**	1,28	0,31	**0,56**	0,92	0,23	**0,42**	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%			
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.

- Double-sided, 12 cutting edges.
- Anti-rotation feature for better stability and higher feed rates.
- Pocketing and profiling capabilities.



Shell Mills

order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5209989	**M200D50Z04RN16**	50	34	22	42	50	4,0	4	26700	Yes	0,36
5210210	**M200D52Z04RN16**	52	36	22	42	50	4,0	4	26000	Yes	0,39
5210212	**M200D63Z06RN16**	63	47	22	49	50	4,0	6	22700	Yes	0,56
5210211	**M200D63Z04RN16**	63	47	22	49	50	4,0	4	22700	Yes	0,58
5210213	**M200D66Z05RN16**	66	50	27	60	50	4,0	5	22000	Yes	0,69
5210214	**M200D80Z05RN16**	80	64	27	60	50	4,0	5	19500	Yes	0,88
5210215	**M200D80Z07RN16**	80	64	27	60	50	4,0	7	19500	Yes	0,89
5210216	**M200D100Z06RN16**	100	84	32	78	50	4,0	6	17000	Yes	1,36
5210217	**M200D100Z08RN16**	100	84	32	78	50	4,0	8	17000	Yes	1,37
5210218	**M200D125Z08RN16**	125	109	40	90	63	4,0	8	14900	Yes	2,50

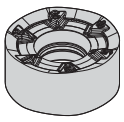
Spare Parts

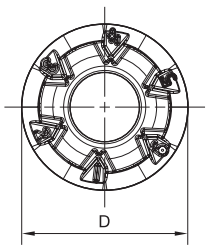
D1 max	 insert screw	 Nm	 wrench	 socket-head cap screw	 socket-head cap screw with coolant groove	 coolant lock screw	 coolant lock screw assembly
50	**192.932**	4,0	**170.026**	**MS1242**	**MS1242CG**	–	–
52	**MS2260**	4,0	**170.026**	**MS1242**	**MS1242CG**	–	–
63	**MS2260**	4,0	**170.026**	**MS1242**	**MS1242CG**	–	–
63	**193.343**	4,0	**170.026**	**MS1242**	**MS1242CG**	–	–
66	**MS2260**	4,0	**170.026**	**MS2038**	**MS2038CG**	–	–
80	**MS2260**	4,0	**170.026**	**MS2038**	**MS2038CG**	–	–
100	**MS2260**	4,0	**170.026**	–	–	**KLS32M**	**MS2195C**
125	**MS2260**	4,0	**170.026**	–	–	**KLS40M**	**MS2187C**

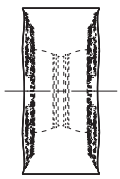
NOTE: Socket-head cap screw with coolant groove and coolant lock screw assembly must be ordered separately.

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	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
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**	–	–


RNGJ-ML





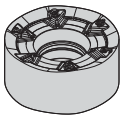
- -ML geometry is the first choice for stainless steel and high-temp alloys.

● first choice
○ alternate choice

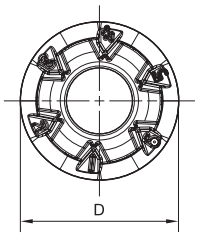
		WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
P			●	●		●	●	●
M			○	●	○	●	○	●
K		●	○	○			○	
N								
S				●	●	●		○
H			○	○				

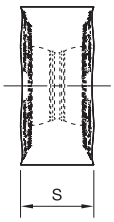
RNGJ-ML

catalogue number	cutting edges	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNGJ1605M0EML	12	16,00	6,35	-	-	5274561	5520354	5274562	5274560	-



RNPJ-MM
RNPJ-MH





- -MM geometry is for general purpose, especially for steel.
- -MH geometry is the first choice for heavy applications, cast iron, and high-strength steels.

● first choice
○ alternate choice

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

■ RNPJ-MM

catalogue number	cutting edges	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNPJ1605M0SMM	12	16,00	6,35	–	5276472	5276471	–	5476637	5276470	5542341

■ RNPJ-MH

catalogue number	cutting edges	D	S	WK15CM	WP20CM	WP25PM	WS30PM	WU35PM	WP35CM	WP40PM
RNPJ1605M0SMH	12	16,00	6,35	5276476	5276475	5276474	–	5476636	5276473	5542342

Recommended Starting Speeds

■ Recommended Starting Speeds [m/min]

Material Group		WK15CM			WP20CM			WP25PM			WS30PM		
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	270	**240**	220
	2	–	–	–	245	**210**	190	220	**190**	155	245	**215**	175
	3	–	–	–	190	**175**	150	170	**145**	115	185	**160**	125
K	1	505	**460**	410	430	**390**	355	275	**245**	220	–	–	–
	2	400	**355**	330	340	**305**	280	215	**190**	180	–	–	–
	3	335	**300**	275	290	**260**	240	180	**160**	145	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	50	**40**	30	55	**50**	35
	2	–	–	–	–	–	–	50	**40**	30	55	**50**	35
	3	–	–	–	–	–	–	60	**50**	30	65	**55**	35
	4	–	–	–	–	–	–	85	**60**	40	100	**70**	50
H	1	–	–	–	170	**140**	115	145	**110**	85	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

(Recommended Starting Speeds [m/min] — continued)

Material Group		WU35PM			WP35CM			WP40PM		
P	1	310	**275**	260	545	**475**	445	355	**310**	295
	2	265	**230**	190	335	**305**	275	300	**260**	215
	3	240	**205**	170	305	**275**	245	275	**235**	190
	4	215	**180**	145	230	**210**	190	245	**205**	160
	5	180	**160**	145	310	**275**	250	205	**185**	160
	6	155	**120**	95	190	**160**	130	180	**140**	110
M	1	205	**180**	160	245	**220**	185	235	**205**	185
	2	185	**155**	130	220	**190**	170	210	**180**	150
	3	140	**120**	95	175	**155**	140	155	**140**	110
K	1	–	**–**	–	355	**320**	290	–	**–**	–
	2	–	**–**	–	280	**250**	230	–	**–**	–
	3	–	**–**	–	235	**210**	190	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	40	**35**	30	–	**–**	–	50	**40**	35
	2	40	**35**	30	–	**–**	–	50	**40**	35
	3	55	**40**	30	–	**–**	–	60	**50**	35
	4	70	**55**	35	80	**60**	40	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.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00 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%			
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 4,00 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%			
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 2,00 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%			
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 1,00 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%			
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.

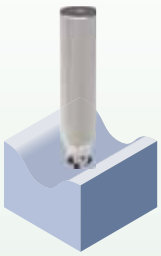
Ideal for Die and Mould Applications •
M170™ Series

M170

Specially engineered with industry standard insert sizes, the M170 Series offers the highest performance rates for best-in-class cost efficiency, high-strength steel, and hard machining capability, and a strong, solid cutter body designed for maximum performance.

- Nickel-coated cutter bodies ensure improved tool life and chip flow.
- Screw-on end mills and shell mills.
- High tooth density for optimised HSM.
- High-accuracy PSTS inserts are ideal for die and mould manufacturing.

Copy Mills

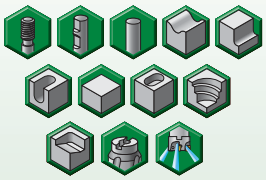


M170™

Max depth of cut: 8mm

Diameter: 12–125mm

Pages: M42–M70



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

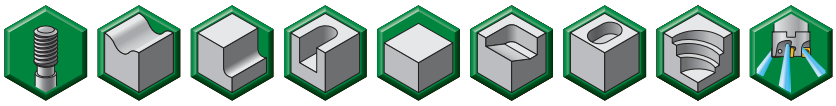
iC12

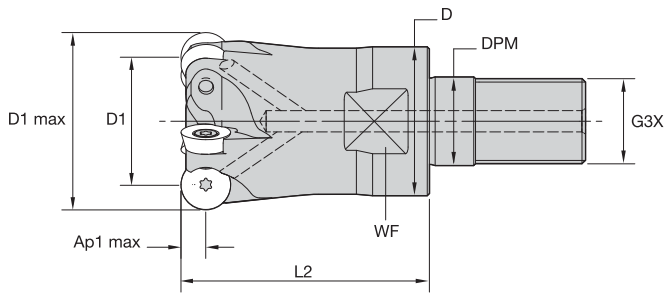
12mm iC insert RDPX
Up to 6mm Ap max.
Diameter range
24–100mm

iC16

16mm iC insert RDPX
Up to 8mm Ap max.
Diameter range
32–125mm

- Longer cutter tool life.
- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Screw-On End Mills

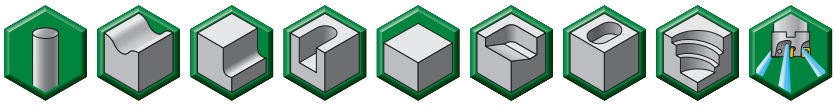
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3935336	**M170D012Z02M06RD07T**	12	5	10	6,5	M6	18	7	3,5	2	22.0°	26200	Yes	0,02
3935337	**M170D012Z02M08RD07T**	12	5	13	8,5	M8	23	10	3,5	2	22.0°	26200	Yes	0,02
3935338	**M170D015Z03M08RD07T**	15	8	13	8,5	M8	18	10	3,5	3	11.0°	21200	Yes	0,02

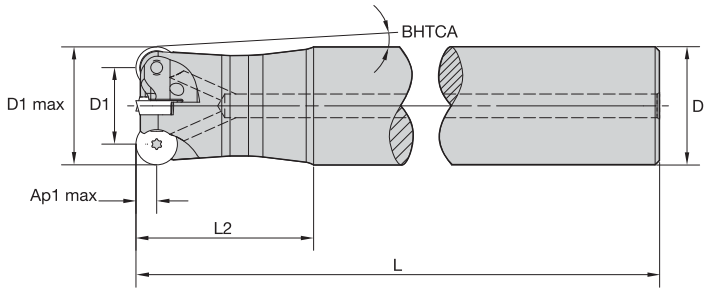
Spare Parts

D1 max	insert screw	Nm	Torx driver
12	**193.364**	1,0	**12147549000**
15	**193.364**	1,0	**12147549000**

NOTE: All spare parts except the insert screws must be ordered separately.

- Longer cutter tool life.
- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Cylindrical Shanks

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
3935342	**M170D015Z03A16RD07TL130**	15	8	16	130	60	0.5°	3,5	3	11.0°	21200	Yes	0,13

Spare Parts

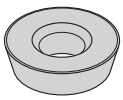
D1 max	 insert screw	 Nm	 Torx driver
12	**193.364**	1,0	**12147549000**
15	**193.364**	1,0	**12147549000**

NOTE: All spare parts except the insert screws must be ordered separately.

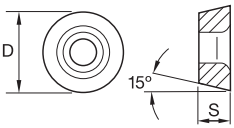
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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**	–	–

iC07 • Inserts



RDHX-MH



- -MH geometry is suitable for high-strength steels, cast iron, and hard machining.

● first choice
○ alternate choice

		TN2505	TN6525	TN6540
P		○	●	●
M			○	●
K		●	○	○
N				
S				●
H		●		

RDHX-MH

catalogue number	D	S	hm	3960578	3960573	3960532
RDHX07T1M0SNMH	7,00	1,98	0,08			

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.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 3,50 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%			
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 1,50 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%			
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 0,75 Axial Depth of Cut (ap)

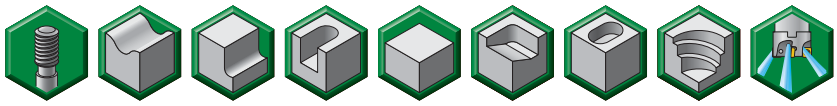
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MH	0,37	**0,75**	1,21	0,27	**0,54**	0,87	0,20	**0,40**	0,65	0,18	**0,35**	0,56	0,16	**0,32**	0,52	MH

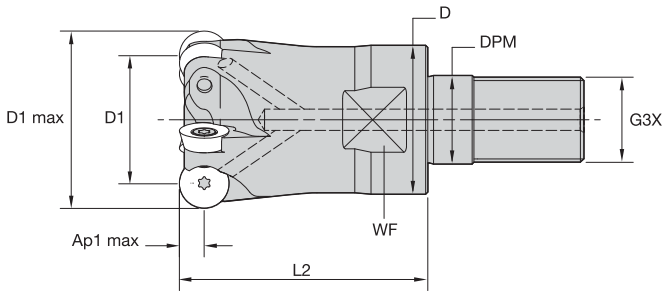
At 0,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
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.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Screw-On End Mills

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
3926611	**M170D030Z05M16RD07**	30	23	29	17,0	M16	43	22	3,5	5	6.5°	10600	Yes	0,20
3926612	**M170D035Z06M16RD07**	35	28	29	17,0	M16	43	22	3,5	6	4.8°	9900	Yes	0,23

Spare Parts

insert screw

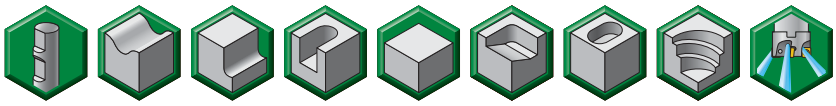
Nm

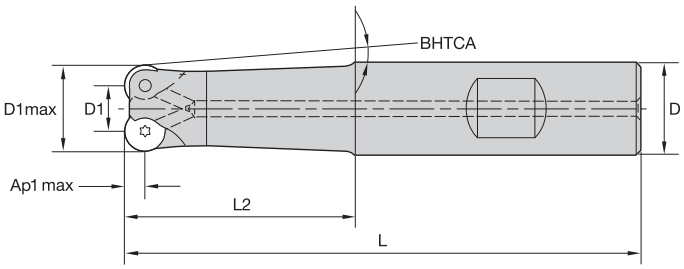
Torx

193.341	1,0	**12147549000**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Weldon Shanks

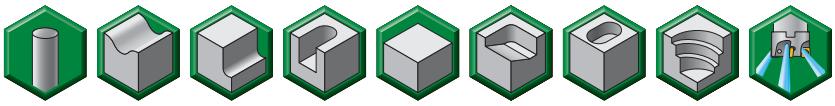
order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3929403	**M170D015Z02B16RD07**	15	8	16	90	40	1.0°	3,5	2	18.0°	21200	Yes	0,11

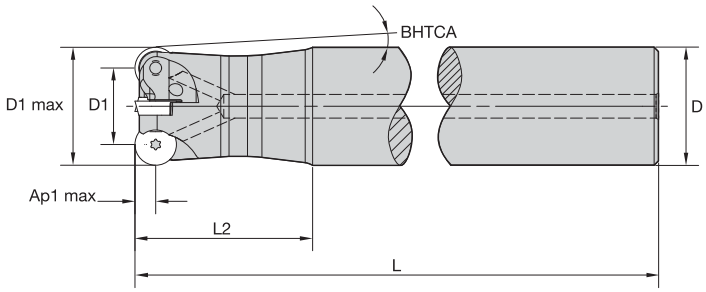
Spare Parts

D1 max	 insert screw	 Nm	 Torx driver
15	**193.341**	1,0	**12147549000**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Cylindrical Shanks

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

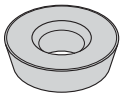
Spare Parts

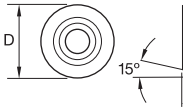
D1 max	 insert screw	 Nm	 Torx driver
15	**193.341**	1,0	**12147549000**
16	**193.341**	1,0	**12147549000**
20	**193.341**	1,0	**12147549000**

NOTE: All spare parts except the insert screws must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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**	–	–


RDPX-MH



- -MH geometry is suitable for high-strength steels, cast iron, and hard machining.

● first choice
○ alternate choice

		TN2505	TN6525	TN6540
P		○	●	●
M			○	●
K		●	○	○
N				
S				●
H		●		

RDPX-MH

catalogue number	D	S	hm	3959627	3959626	3959625
RDPX0702M0SNMH	7,00	2,38	0,08			

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.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 3,50 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%			
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 1,50 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%			
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 0,75 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%			
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 0,50 Axial Depth of Cut (ap)

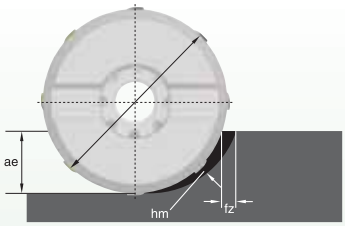
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MH	0,45	**0,91**	1,47	0,32	**0,65**	1,05	0,24	**0,49**	0,78	0,21	**0,42**	0,68	0,19	**0,39**	0,62	MH

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

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

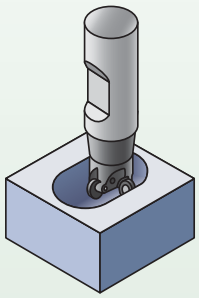
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



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.

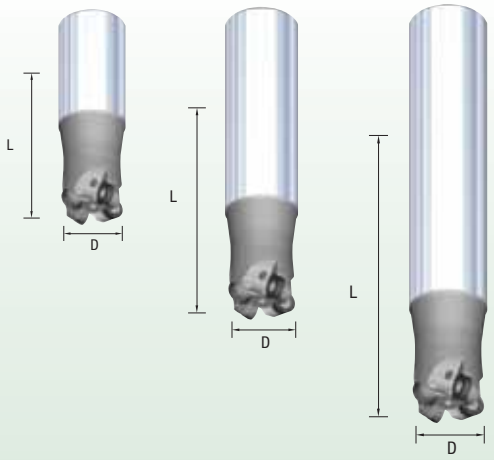


Example Cutting Conditions for RD..07... Insert in Pocketing, L/D ratio = 2 x D:

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

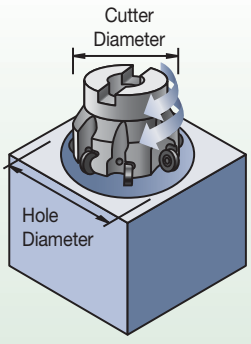
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:



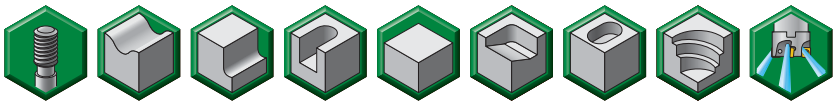
L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65–75%	10–15%
>4	80–95%	20–40%

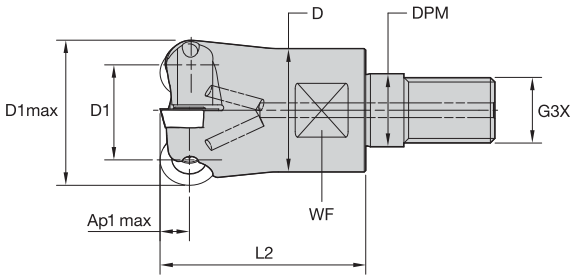
Recommended Cutting Conditions • Helical Interpolation from Solid

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



- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Screw-On End Mills

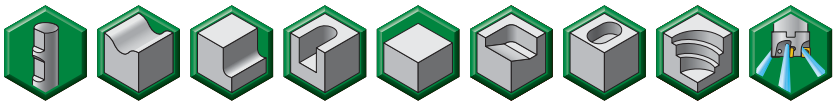
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3934647	**M170D020Z02M10RD10**	20	10	18	10,5	M10	30	15	5,0	2	20.0°	15900	Yes	0,06
3934648	**M170D025Z02M12RD10**	25	15	21	12,5	M12	35	19	5,0	2	8.0°	12800	Yes	0,10
3934649	**M170D025Z03M12RD10**	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
3934651	**M170D035Z05M16RD10**	35	25	29	17,0	M16	45	22	5,0	5	8.5°	9100	Yes	0,23
3934652	**M170D042Z06M16RD10**	42	32	29	17,0	M16	45	22	5,0	6	6.0°	7800	Yes	0,28

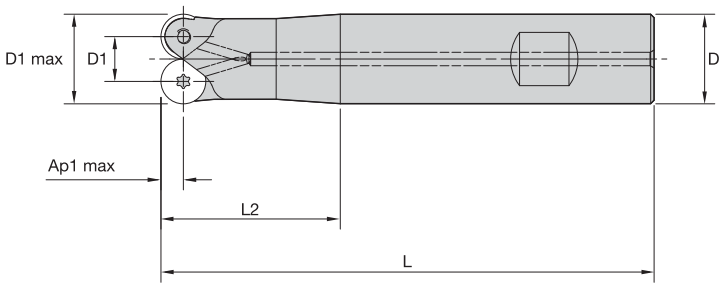
Spare Parts

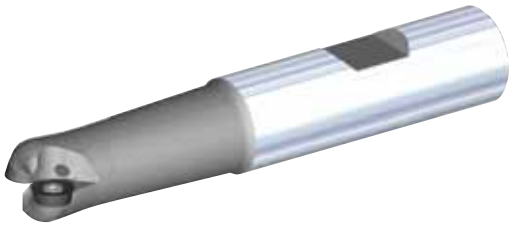
		
insert screw	**Nm**	**Torx driver**
193.342	3,5	**12148082400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.







Weldon Shanks

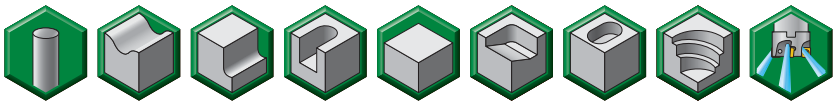
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940703	**M170D020Z02B20RD10**	20	10	20	110	40	5,0	2	20.0°	15900	Yes	0,24
3940708	**M170D025Z03B25RD10**	25	15	25	110	40	5,0	3	9.0°	12900	Yes	0,35

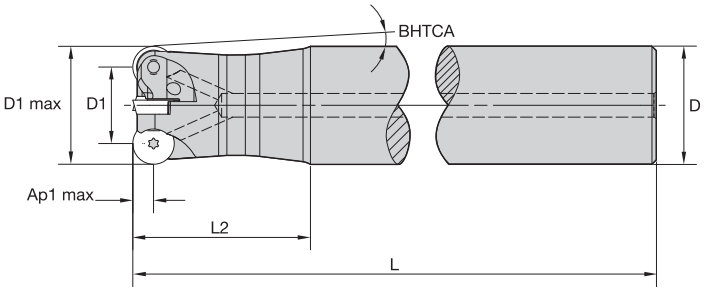
Spare Parts

D1 max	insert screw	Nm	Torx driver
20	**193.342**	3,5	**12148082400**
25	**193.342**	3,5	**12148082400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Cylindrical Shanks

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
3940711	**M170D028Z02A25RD10L200**	28	18	25	200	40	–	5,0	2	15.0°	11300	Yes	0,74

Spare Parts

insert screw

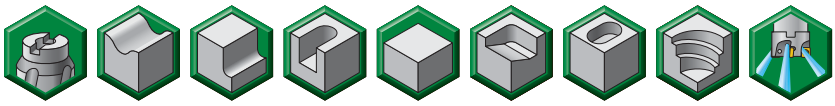
Nm

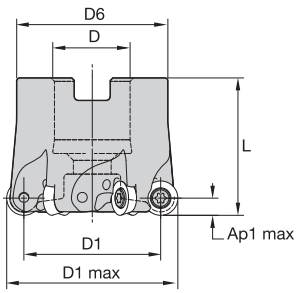
Torx driver

193.342	3,5	**12148082400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Shell Mills

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

Spare Parts

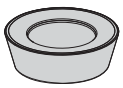
D1 max	insert screw	Nm	Torx driver	socket-head cap screw	low-head cap screw	socket-head cap screw with coolant groove
40	**193.342**	3,5	**12148082400**	**MS1294**	**–**	**MS1294CG**
42	**193.342**	3,5	**12148082400**	**MS1294**	**–**	**MS1294CG**
50	**193.342**	3,5	**12148082400**	**–**	**129.025**	**MS2072CG**
52	**193.342**	3,5	**12148082400**	**–**	**129.025**	**MS2072CG**

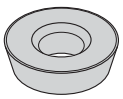
NOTE: All spare parts except the insert screws must be ordered separately.

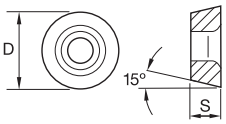
Insert Selection Guide

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**	–	–

iC10 • Inserts


RDPX-MM


RDPX-MH



- -MM geometry is the best option for general-purpose use, materials, and applications. Used for reduced cutting forces.

● first choice
○ alternate choice

		TN2505	TN6525	TN6540
P		○	●	●
M			○	●
K		●	○	○
N				
S				●
H		●		

RDPX-MM

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1003M0SNMM	10,00	3,18	0,11		3959633	3959582

- -MH geometry is the first choice for heavy machining.
- Suitable for high-strength steels, cast iron, and hard machining.

RDPX-MH

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1003M0SNMH	10,00	3,18	0,12	3959581	3959580	3959579

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.

Recommended Starting Feeds

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%			
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 2,00 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%			
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 1,00 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%			
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 0,50 Axial Depth of Cut (ap)

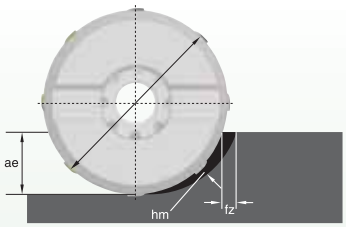
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,64	**0,94**	1,73	0,46	**0,68**	1,24	0,35	**0,51**	0,92	0,30	**0,44**	0,80	0,28	**0,40**	0,73	MM
MH	0,77	**1,36**	2,31	0,55	**0,97**	1,63	0,41	**0,73**	1,21	0,36	**0,63**	1,05	0,33	**0,58**	0,96	MH

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

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

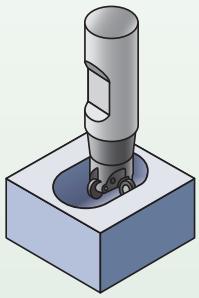
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



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.

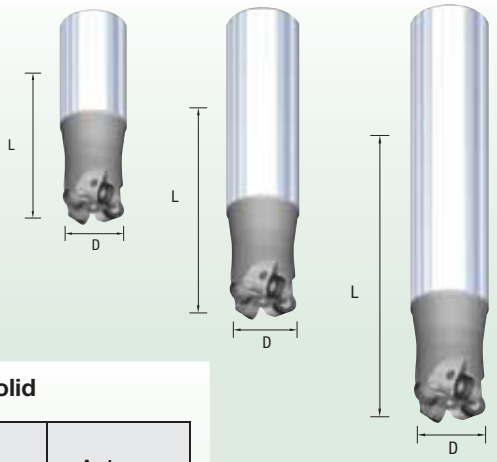


Example Cutting Conditions for RD..10... Insert in Pocketing, L/D ratio = 2 x D:

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

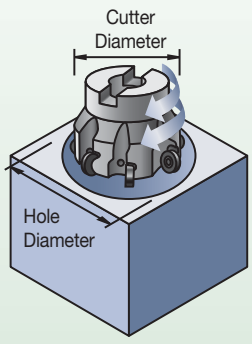
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:



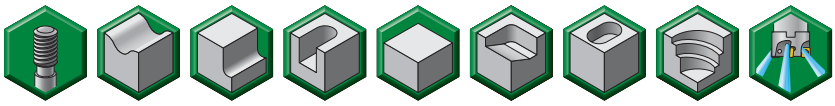
L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65–75%	10–15%
>4	80–95%	20–40%

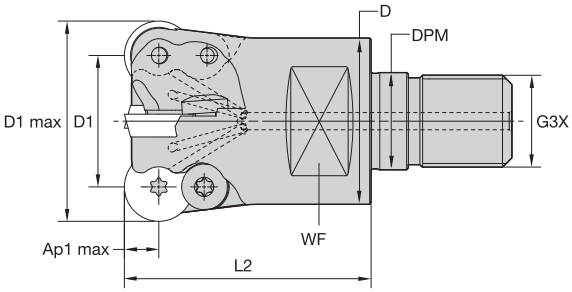
Recommended Cutting Conditions • Helical Interpolation from Solid

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



- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Screw-On End Mills

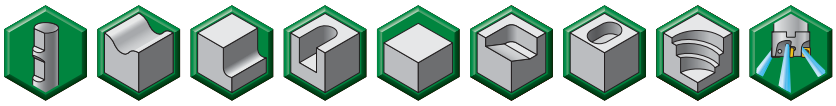
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930950	**M170D024Z02M12RD12**	24	12	21	12,5	M12	35	19	6,0	2	15.0°	13200	Yes	0,08
3930954	**M170D035Z03M16RD12**	35	23	29	17,0	M16	43	22	6,0	3	11.0°	9900	Yes	0,22
3930956	**M170D035Z04M16RD12**	35	23	29	17,0	M16	43	22	6,0	4	10.5°	9900	Yes	0,21
3930958	**M170D042Z05M16RD12**	42	30	29	17,0	M16	43	22	6,0	5	7.2°	7500	Yes	0,26

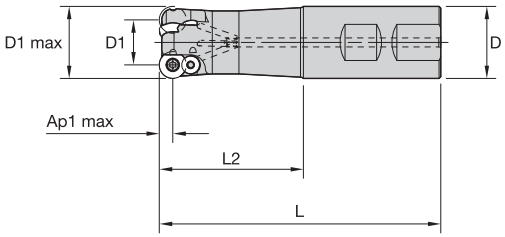
Spare Parts

D1 max	 insert screw	 Nm	 clamp screw	 Torx driver
24	**193.342**	3,5	**193.338**	**12148082400**
35	**193.342**	3,5	**193.338**	**12148082400**
42	**193.342**	3,5	**193.338**	**12148082400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Weldon Shanks

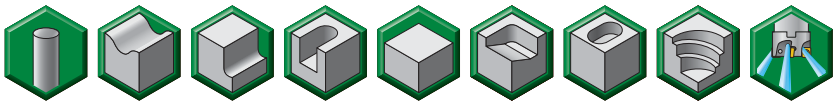
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930960	**M170D032Z03B32RD12**	32	20	32	125	64	6,0	3	12.0°	9500	Yes	0,63

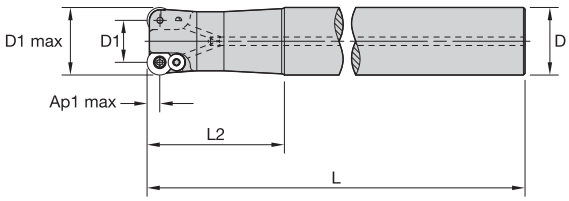
Spare Parts

D1 max	 insert screw	 Nm	 clamp screw	 Torx driver
32	**193.342**	3,5	**193.338**	**12148082400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Cylindrical Shanks

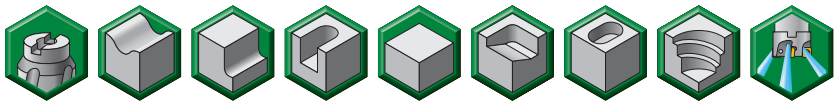
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930962	**M170D032Z02A32RD12L200**	32	20	32	200	65	6,0	2	12.0°	9500	Yes	1,12
3930964	**M170D032Z02A32RD12L300**	32	20	32	300	65	6,0	2	12.0°	9500	Yes	1,74
3930966	**M170D035Z02A32RD12L300**	35	23	32	300	40	6,0	2	11.0°	9100	Yes	1,79

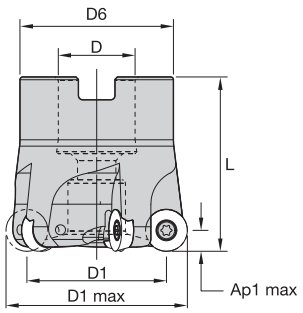
Spare Parts

D1 max	 insert screw	 Nm	 clamp screw	 Torx driver
32	**193.342**	3,5	**193.338**	**12148082400**
35	**193.342**	3,5	**193.338**	**12148082400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.

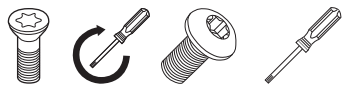




Shell Mills

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

Spare Parts

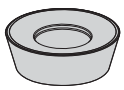


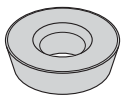
D1 max	insert screw	Nm	clamp screw	Torx driver	low-head cap screw	low-head cap screw with coolant groove	socket-head cap screw	socket-head cap screw with coolant groove
40	**193.342**	3,5	**193.338**	**12148082400**	**–**	**–**	**MS1294**	**MS1294CG**
50	**193.342**	3,5	**193.338**	**12148082400**	**129.025**	**–**	**–**	**MS2072CG**
52	**193.342**	3,5	**193.338**	**12148082400**	**129.025**	**–**	**–**	**MS2072CG**
63	**193.342**	3,5	**193.338**	**12148082400**	**129.025**	**–**	**–**	**MS2072CG**
66	**193.342**	3,5	**193.338**	**12148082400**	**–**	**–**	**MS2038**	**MS2038CG**
80	**193.342**	3,5	**193.338**	**12148082400**	**–**	**–**	**MS2038**	**MS2038CG**
100	**193.342**	3,5	**193.338**	**12148082400**	**MS1254**	**MS1254CG**	**–**	**–**

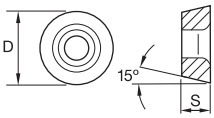
NOTE: Socket-head cap screw, socket-head cap screw with coolant groove, low-head cap screw with coolant groove, and Torx driver must be ordered separately.

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**	–	–


RDPX-MM


RDHX-MH



- -MM geometry is the best option for general-purpose use, materials, and applications. Used for reduced cutting forces.

● first choice
○ alternate choice

		TN2505	TN6525	TN6540
P		○	●	●
M			○	●
K		●	○	○
N				
S				●
H		●		

RDPX-MM

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX12T3M0SNMM	12,00	3,97	0,13	-	3959624	3959623

- -MH geometry is the first choice for heavy machining.
- Suitable for high-strength steels, cast iron, and hard machining.

RDPX-MH

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX12T3M0SNMH	12,00	3,97	0,17	3959622	3959621	3959620

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.

Recommended Starting Feeds

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%			
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 3,00 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%			
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 2,00 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%			
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 1,00 Axial Depth of Cut (ap)

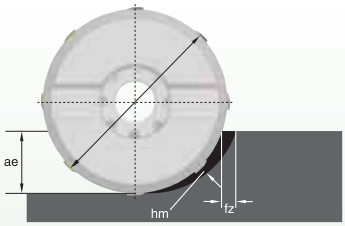
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,60	**0,88**	1,38	0,43	**0,63**	0,99	0,32	**0,47**	0,74	0,28	**0,41**	0,64	0,26	**0,38**	0,59	MM
MH	0,63	**1,28**	2,16	0,45	**0,91**	1,53	0,34	**0,68**	1,14	0,30	**0,59**	0,99	0,27	**0,54**	0,90	MH

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

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

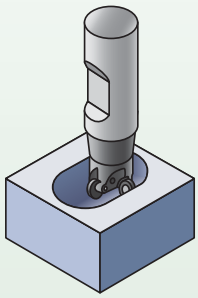
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



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.



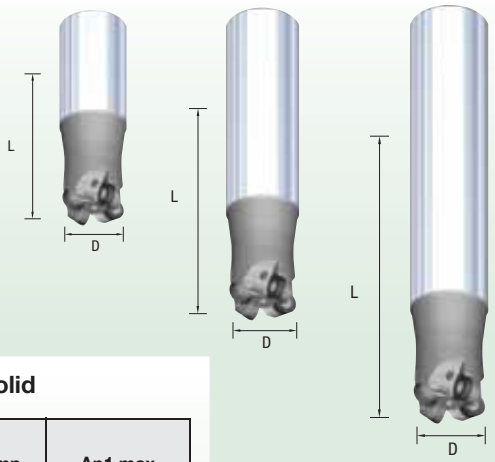
Example Cutting Conditions for RD..10... Insert in Pocketing, L/D ratio = 2 x D:

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

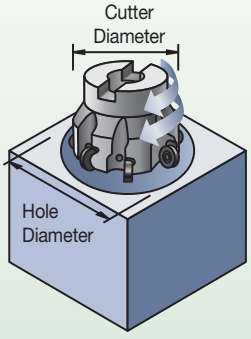
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

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%

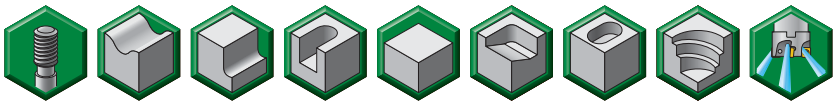


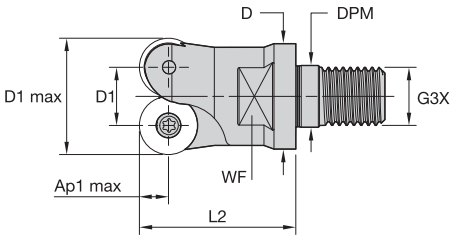
Recommended Cutting Conditions • Helical Interpolation from Solid

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



- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





Screw-On End Mills

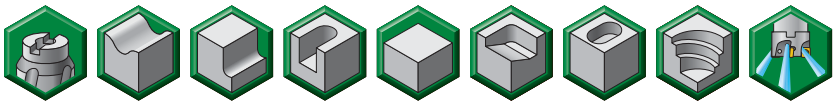
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926601	**M170D032Z02M16RD16**	32	16	29	17,0	M16	43	22	8,0	2	20.0°	9950	Yes	0,17

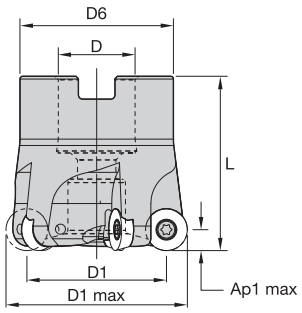
Spare Parts

D1 max	 insert screw	 Nm	 Torx driver
32	**193.343**	6,0	**12148099400**

NOTE: All spare parts except the insert screws must be ordered separately.

- Premium nickel-coated bodies.
- Designed for maximum performance.
- Ideally suited for die and mould manufacturing.





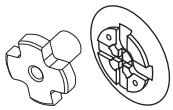
Shell Mills

order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926602	**M170D050Z04RD16**	50	34	22	44	40	8,0	4	8.5°	7900	Yes	0,28
3934623	**M170D052Z04RD16**	52	36	22	44	50	8,0	4	8.2°	7650	Yes	0,36
3934624	**M170D063Z05RD16**	63	47	22	44	40	8,0	5	5.5°	5300	Yes	0,39
3934625	**M170D066Z05RD16**	66	50	27	60	50	8,0	5	4.0°	6000	Yes	0,74
3934626	**M170D080Z06RD16**	80	64	27	60	50	8,0	6	3.0°	4900	Yes	1,06
3934628	**M170D100Z07RD16**	100	84	32	80	55	8,0	7	2.4°	3950	Yes	1,94
3934629	**M170D125Z08RD16**	125	109	40	90	60	8,0	8	2.2°	3200	Yes	2,90

Spare Parts





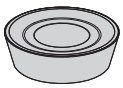
D1 max	insert screw	Nm	clamp screw	Torx driver	low-head cap screw	low-head cap screw with coolant groove	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw	coolant cap
50	**193.343**	6,0	**193.383**	**12148099400**	**129.025**	–	–	**MS2072CG**	–	–
52	**193.343**	6,0	**193.383**	**12148099400**	**129.025**	–	–	**MS2072CG**	–	–
63	**193.343**	6,0	**193.383**	**12148099400**	**129.025**	–	–	**MS2072CG**	–	–
66	**193.343**	6,0	**193.383**	**12148099400**	–	–	**MS2038**	**MS2038CG**	–	–
80	**193.343**	6,0	**193.383**	**12148099400**	–	–	**MS2038**	**MS2038CG**	–	–
100	**193.343**	6,0	**193.383**	**12148099400**	**MS1254**	**MS1254CG**	–	–	–	–
125	**193.343**	6,0	**193.383**	**12148099400**	**129.512**	–	–	–	**420.200**	**470.232**

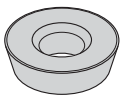
NOTE: All spare parts except the insert screws and clamp screws must be ordered separately.

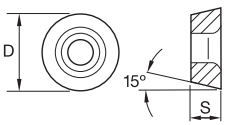
Insert Selection Guide

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**	–	–

iC16 • Inserts


RDPX-MM


RDPX-MH



- -MM geometry is the best option for general-purpose use, materials, and applications. Used for reduced cutting forces.

● first choice
○ alternate choice

		TN2505	TN6525	TN6540
P		○	●	●
M			○	●
K		●	○	○
N				
S				●
H		●		

RDPX-MM

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1604M0SNMM	16,00	4,76	0,14	1	3960516	3960515

- -MH geometry is the first choice for heavy machining.
- Suitable for high-strength steels, cast iron, and hard machining.

RDPX-MH

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1604M0SNMH	16,00	4,76	0,22	3960514	3960513	3960462

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.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00 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%			
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 4,00 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%			
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 2,00 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%			
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 1,00 Axial Depth of Cut (ap)

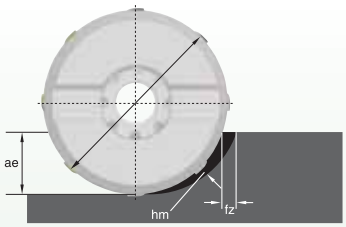
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
MM	0,81	**1,08**	1,71	0,58	**0,78**	1,22	0,43	**0,58**	0,91	0,38	**0,51**	0,79	0,35	**0,46**	0,72	MM
MH	1,06	**1,46**	2,48	0,76	**1,04**	1,75	0,57	**0,78**	1,30	0,50	**0,68**	1,13	0,45	**0,62**	1,03	MH

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

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

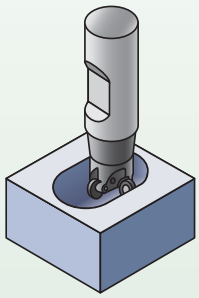
With round inserts, two factors can affect the hm: Ap1 and ae.
fz has to be adjusted accordingly.



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.

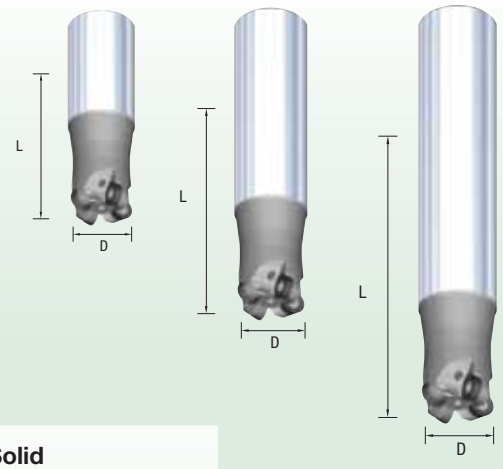


Example Cutting Conditions for iC16mm... Insert in Pocketing, up to 3 L/D approximately:

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

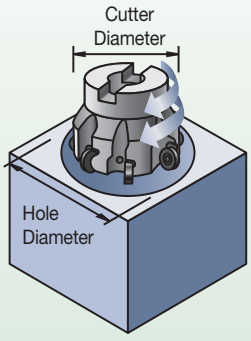
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:



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



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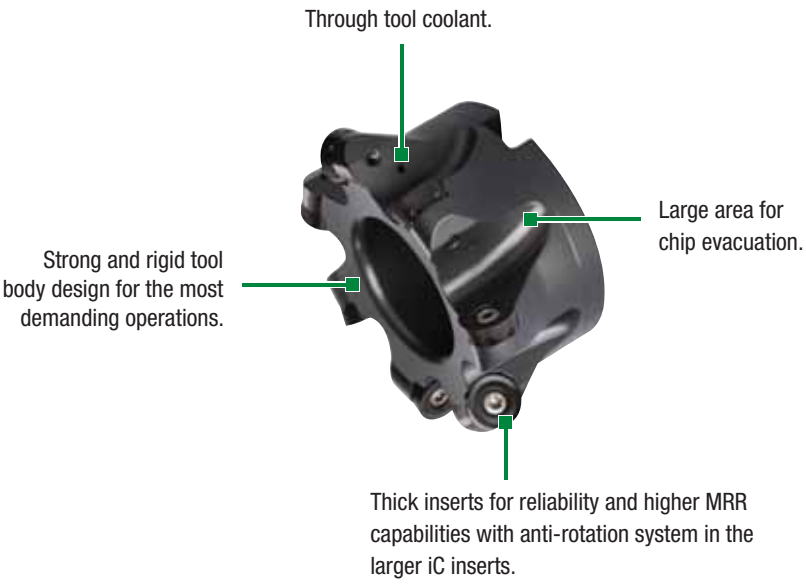
- Increased chip evacuation and through tool coolant for enhanced performance.



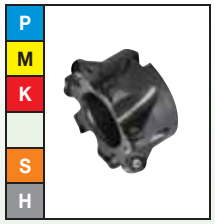
Copy Mills

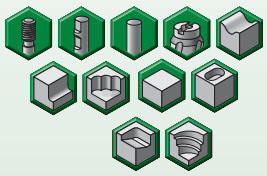
M100™

Max depth of cut: 6mm

Diameter: 24–125mm

Pages: M74–M99





Insert Offering

08mm iC
RD Insert Type
Ground and PSTS

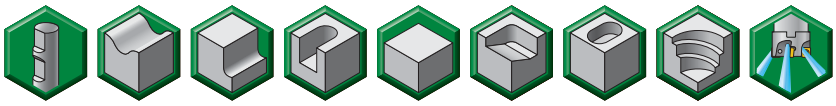
10mm iC
RD Insert Type
Ground and PSTS

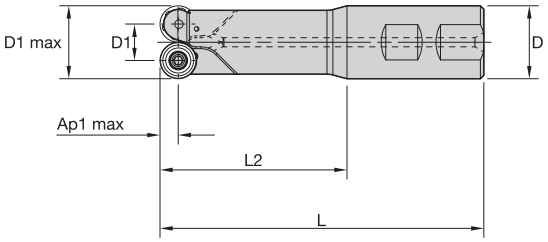
12mm iC
RD Insert Type
Anti-rotation Feature
Ground and PSTS

16mm iC
RD Insert Type
Anti-rotation Feature
Ground and PSTS

16mm iC
RC Insert Type
Anti-rotation Feature
Ground and PSTS

- General purpose face and copy milling.





Weldon Shanks

order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021331	**12391010000**	12	4	16	90	42	4,0	1	2.0°	33000	Yes	0,10
2021332	**12391010400**	12	4	16	130	82	4,0	1	2.0°	33000	Yes	0,10
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

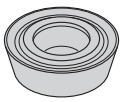
Spare Parts

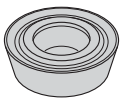
D1 max	 insert screw	 Nm	 Torx driver
12	**12148001300**	3,0	**12148086600**
16	**12148001300**	3,0	**12148086600**

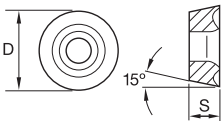
NOTE: All spare parts except the insert screws must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	RDMT-T	TN7525	**RDMT-T**	**TN7525**	RDMT-T	TN7535
P3–P4	RDMT-T	TN7525	**RDMW-T**	**TN6540**	RDMW-T	TN6540
P5–P6	RDMT-T	TN7525	**RDMT-T**	**TN7535**	RDMT-T	TN7535
M1–M2	RDHT-T	TN7525	**RDHT-T**	**TN7525**	RDMT-T	TN7535
M3	RDHT-T	TN7525	**RDHT-T**	**TN7525**	RDMT-T	TN7535
K1–K2	–	–	**RDMW-T**	**TN7535**	RDMW-T	TN7535
K3	–	–	**RDMW-T**	**TN7535**	RDMW-T	TN7535
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	–	–	–	–	–	–


RDMT-T


RDHT-T



● first choice
○ alternate choice

		TN2510	TN6540	TN7525	TN7535
P		○	●	●	●
M			●	○	○
K		●	○		○
N					
S			●		
H		●			

- Precision ground insert; first choice for light machining.

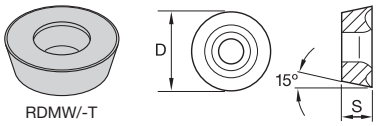
RDHT-T

catalogue number	D	S	hm	TN2510	TN6540	TN7525	TN7535
RDHT0802M0T	8,00	2,38	0,09	ı	ı	2012426	ı

- Precision pressed insert; positive geometry for lower cutting forces.
- First choice for general machining, stainless steel, and high-temp alloys in roughing operations.

RDMT-T

catalogue number	D	S	hm	TN2510	TN6540	TN7525	TN7535
RDMT0802M0T	8,00	2,38	0,09	ı	ı	2012518	2020757



RDMW/-T

- Precision pressed insert.
- First choice for roughing operations, especially for steel and cast iron.

● first choice
○ alternate choice

		TN2510	TN6540	TN7525	TN7535
P		○	●	●	●
M			●	○	○
K		●	○		○
N					
S			●		
H		●			

RDMW/-T

catalogue number	D	S	hm	TN2510	TN6540	TN7525	TN7535
RDMW0802M0	8,00	2,38	0,09	2012564	-	-	-
RDMW0802M0T	8,00	2,38	0,09	-	3353278	-	2020727

Recommended Starting Speeds

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6540			TN7525			TN7535		
P	1	660	**580**	540	360	**280**	240	410	**310**	280	545	**475**	445
	2	410	**370**	330	250	**190**	170	310	**250**	215	335	**305**	275
	3	370	**330**	305	215	**170**	140	280	**215**	185	305	**275**	245
	4	275	**260**	230	180	**130**	110	235	**170**	145	230	**210**	190
	5	330	**300**	275	240	**180**	150	310	**235**	200	310	**275**	250
	6	230	**205**	175	160	**120**	100	205	**160**	130	190	**160**	130
M	1	270	**240**	210	130	**80**	60	245	**220**	185	245	**220**	185
	2	245	**210**	190	80	**50**	40	220	**190**	170	220	**190**	170
	3	190	**175**	150	85	**50**	40	175	**155**	140	175	**155**	140
K	1	420	**360**	300	220	**205**	180	380	**280**	240	355	**320**	290
	2	360	**300**	250	175	**155**	140	325	**240**	200	280	**250**	230
	3	300	**250**	200	155	**145**	125	240	**200**	170	235	**210**	190
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–
	2	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–
	3	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–
	4	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–

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

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**	0,20	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)

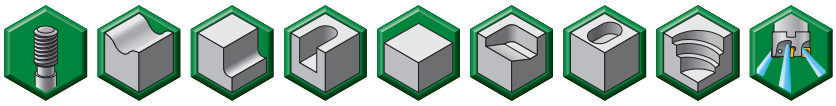
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDMW-	0,28	**0,44**	0,63	0,20	**0,32**	0,46	0,15	**0,24**	0,34	0,13	**0,21**	0,30	0,12	**0,19**	0,27	RDMW-
RDHT-T	0,35	**0,47**	0,95	0,25	**0,34**	0,69	0,19	**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

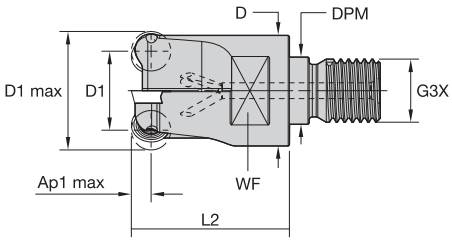
At 0,50 Axial Depth of Cut (ap)

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.

- General purpose face and copy milling.





Screw-On End Mills

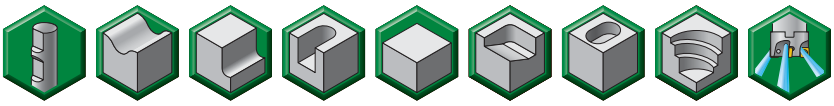
order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021375	**12391050400**	25	15	22	12,5	M12	52	30	19	5,0	2	15.8°	22000	Yes	0,10
2021376	**12391050600**	30	20	28	17,0	M16	63	40	22	5,0	3	10.3°	20000	Yes	0,20

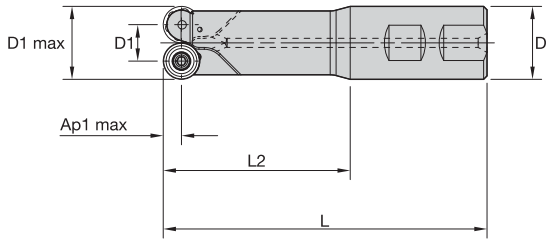
Spare Parts

insert screw	Nm	Torx wrench
12148036700	3,0	**12148000600**

NOTE: All spare parts except the insert screws must be ordered separately.

- General purpose face and copy milling.





Weldon Shanks

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
2021338	**12391012400**	20	10	25	183	127	5,0	2	7.5°	25000	Yes	0,50
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

Spare Parts

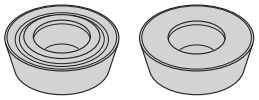
 insert screw	 Nm	 Torx driver
12148036700	3,0	**12148000600**

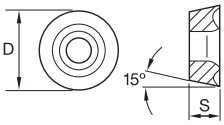
NOTE: All spare parts except the insert screws must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	RDMT-T	TN6525	**RDMT-T**	**TN6540**	RDMT-T	TN6540
P3–P4	RDMT-T	TN6525	**RDMW-T**	**TN6540**	RDMW-T	TN6540
P5–P6	RDMT-T	TN7525	**RDMT-T**	**TN7535**	RDMW-T	TN7535
M1–M2	RDHT-T	TN7525	**RDHT-T**	**TN7525**	RDMT-T	TN6540
M3	RDHT-T	TN7525	**RDMT-T**	**TN6540**	RDMT-T	TN6540
K1–K2	RDHW-MH	TN2510	**RDHW-MH**	**TN2510**	RDMW-T	TN7535
K3	RDHW-MH	TN2510	**RDHW-MH**	**TN2510**	RDMW-T	TN7535
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**RDMT-T**	**TN6540**	–	–
S3	–	–	**RDMT-T**	**TN6540**	–	–
S4	–	–	**RDMT-T**	**TN6540**	RDMT-T	TN6540
H1	RDHW-MH	TN2510	**RDHW-MH**	**TN2510**	–	–

iC10 • Inserts





● first choice
○ alternate choice

		TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
P		○	●	●	●	●	●
M			○	●	○	○	○
K		●	○	○		○	
N							
S				●			
H		●					

- Precision ground insert; first choice for light machining.

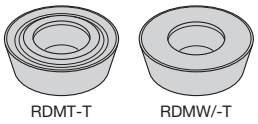
RDHT-T

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDHT1003M0T	10,00	3,18	0,14	'	'	'	2012446	'	'

- Precision ground flat top geometry.

RDHW-MH

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDHW1003M0MH	10,00	3,18	0,14	2012480	'	'	'	'	'



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

● first choice
○ alternate choice

- Precision pressed insert; positive geometry for lower cutting forces.
- First choice for general machining, stainless steel, and high-temp alloys in roughing operations.

RDMT-T

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDMT1003M0T	10,00	3,18	0,14	-	2957429	2957428	2012534	2276618	-

- Precision pressed insert with flat top geometry.
- First choice for cast iron and high-strength steel.

RDMW/-T

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDMW1003M0	10,00	3,18	0,09	2012572	-	-	-	-	-
RDMW1003M0T	10,00	3,18	0,14	-	-	3353279	2109381	2020735	2012578

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6525			TN6540			TN7525			TN7535			TTI25		
P	1	660	**580**	540	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445	430	**360**	300
	2	410	**370**	330	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275	310	**250**	215
	3	370	**330**	305	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245	310	**250**	215
	4	275	**260**	230	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190	265	**215**	180
	5	330	**300**	275	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250	320	**235**	200
	6	230	**205**	175	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130	145	**110**	90
M	1	270	**240**	210	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185	480	**310**	215
	2	245	**210**	190	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170	325	**205**	145
	3	190	**175**	150	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140	320	**210**	145
K	1	420	**360**	300	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290	220	**185**	155
	2	360	**300**	250	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230	180	**145**	125
	3	300	**250**	200	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190	145	**125**	100
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

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%			
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 2,00 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-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 1,00 Axial Depth of Cut (ap)

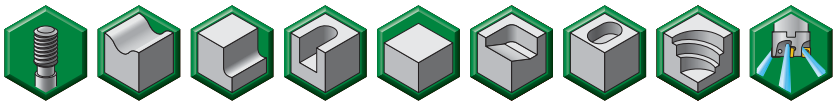
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-T	0,39	**0,65**	1,09	0,28	**0,47**	0,78	0,21	**0,35**	0,58	0,18	**0,31**	0,51	0,17	**0,28**	0,47	RDHT-T
RDHW-MH	0,39	**0,71**	1,49	0,28	**0,51**	1,06	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

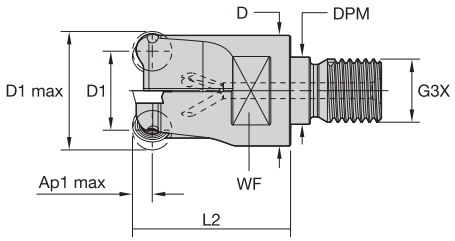
At 0,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-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.

- General purpose face and copy milling.
- Anti-rotation feature for top security.





Screw-On End Mills

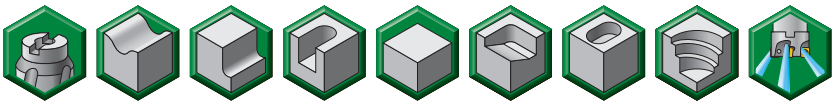
order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021374	**12391050200**	24	12	22	12,5	M12	52	30	19	6,0	2	10.0°	23000	Yes	0,10
2021378	**12391051000**	35	23	28	17,0	M16	63	40	22	6,0	3	10.8°	19000	Yes	0,20
2021379	**12391051200**	40	28	28	17,0	M16	63	40	22	6,0	4	8.3°	17000	Yes	0,30

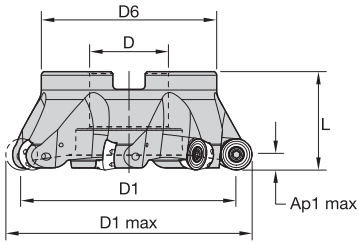
Spare Parts

D1 max	 insert screw	 Nm	 Torx wrench
24	**12148038800**	3,0	**12148000600**
35	**12148038800**	3,0	**12148000600**
40	**12148038800**	3,0	**12148000600**

NOTE: All spare parts except the insert screws must be ordered separately.

- General purpose face and copy milling.
- Anti-rotation feature for top security.





Shell Mills

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
2021346	**12391020800**	125	113	40	89	50	6,0	7	2.0°	10000	No	1,70

Spare Parts

D1 max	insert screw	Nm	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove
50	**12148038800**	3,0	**12148000600**	**125.025**	**MS1234CG**
52	**12148038800**	3,0	**12148000600**	**125.025**	**MS1234CG**
63	**12148038800**	3,0	**12148000600**	**125.230**	**MS2038CG**
80	**12148038800**	3,0	**12148000600**	**125.230**	**MS2038CG**
100	**12148038800**	3,0	**12148000600**	**–**	**–**
125	**12148038800**	3,0	**12148000600**	**–**	**–**

NOTE: All spare parts except the insert screws must be ordered separately.

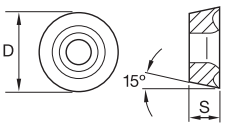
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	RDMT-TX	TN7525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
P3–P4	RDMT-TX	TN7525	**RDMW-TX**	**TN6540**	RDMW-TX	TN6540
P5–P6	RDMT-TX	TN7525	**RDPT-MMX**	**TN7535**	RDPT-MMX	TN7535
M1–M2	RDHT-TX	TN7525	**RDMT-TX**	**TN6540**	RDPT-MMX	TN6540
M3	RDHT-TX	TN7525	**RDMT-TX**	**TN6540**	RDPT-MMX	TN6540
K1–K2	RDMW-TX	WK15CM	**RDMW-TX**	**WK15CM**	RDMW-TX	TN7535
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**	–	–

iC12 • Inserts


RDHT-TX


RDHW-MH



- Precision ground positive geometry for lower cutting forces.
- First choice for general machining, stainless steel, and high-temp alloys.

● first choice
○ alternate choice

	TN2510	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
P	○	●	●	●	●		
M		○	●	○	○		○
K	●	○	○		○	●	
N							
S			●				●
H	●						

RDHT-TX

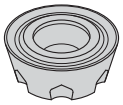
catalogue number	number of indexes	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
RDHT1204M0TX	6	12,00	4,76	0,12	ı	ı	ı	2020775	ı	ı	ı

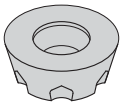
- Precision ground flat top insert.
- Alternative choice for stable milling operations in high-strength steel and hardened materials.

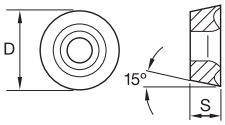
RDHW-MH

catalogue number	number of indexes	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
RDHW1204M0MH	6	12,00	4,76	0,14	2012484	ı	ı	ı	ı	ı	ı


RDPT-MMX


RDMT-TX


RDMW-TX



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

● first choice
○ alternate choice

- Precision pressed insert.
- Improved performance in stainless steel and high-temp alloys.

RDPT-MMX

catalogue number	number of indexes	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
RDPT1204M0SMMX	6	12,00	4,76	0,18	-	-	5176974	-	5176975	-	-

- Precision pressed positive geometry for lower cutting forces.
- First choice for general machining, stainless steel, and high-temp alloys in roughing operations.

RDMT-TX

catalogue number	number of indexes	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
RDMT1204M0TX	6	12,00	4,76	0,15	2109552	2957430	2957432	2020763	2109542	-	5520247

- Precision pressed insert.
- First choice for roughing operations, especially for steel and cast iron.

RDMW-TX

catalogue number	number of indexes	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
RDMW1204M0TX	6	12,00	4,76	0,15	2012594	-	3353281	2109440	2020741	5427441	-

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6525			TN6540			TN7525		
P	1	660	**580**	540	410	**320**	280	360	**280**	240	410	**310**	280
	2	410	**370**	330	320	**250**	215	250	**190**	170	310	**250**	215
	3	370	**330**	305	280	**215**	185	215	**170**	140	280	**215**	185
	4	275	**260**	230	235	**170**	145	180	**130**	110	235	**170**	145
	5	330	**300**	275	310	**235**	200	240	**180**	150	310	**235**	200
	6	230	**205**	175	205	**160**	130	160	**120**	100	205	**160**	130
M	1	270	**240**	210	190	**120**	80	130	**80**	60	245	**220**	185
	2	245	**210**	190	120	**80**	50	80	**50**	40	220	**190**	170
	3	190	**175**	150	125	**80**	55	85	**50**	40	175	**155**	140
K	1	420	**360**	300	275	**245**	220	220	**205**	180	380	**280**	240
	2	360	**300**	250	215	**190**	180	175	**155**	140	325	**240**	200
	3	300	**250**	200	180	**160**	145	155	**145**	125	240	**200**	170
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		TN7535			WK15CM			WS30PM			TTI25		
P	1	545	**475**	445	–	**–**	–	–	**–**	–	430	**360**	300
	2	335	**305**	275	–	**–**	–	–	**–**	–	310	**250**	215
	3	305	**275**	245	–	**–**	–	–	**–**	–	310	**250**	215
	4	230	**210**	190	–	**–**	–	–	**–**	–	265	**215**	180
	5	310	**275**	250	–	**–**	–	–	**–**	–	320	**235**	200
	6	190	**160**	130	–	**–**	–	–	**–**	–	145	**110**	90
M	1	245	**220**	185	–	**–**	–	270	**240**	220	480	**310**	215
	2	220	**190**	170	–	**–**	–	245	**215**	175	325	**205**	145
	3	175	**155**	140	–	**–**	–	185	**160**	125	320	**210**	145
K	1	355	**320**	290	505	**460**	410	–	**–**	–	220	**185**	155
	2	280	**250**	230	400	**355**	330	–	**–**	–	180	**145**	125
	3	235	**210**	190	335	**300**	275	–	**–**	–	145	**125**	100
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	55	**50**	35	–	**–**	–
	2	–	**–**	–	–	**–**	–	55	**50**	35	–	**–**	–
	3	–	**–**	–	–	**–**	–	65	**55**	35	–	**–**	–
	4	–	**–**	–	–	**–**	–	100	**70**	50	–	**–**	–
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

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)

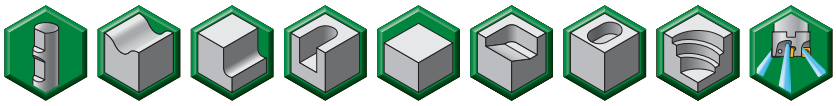
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,53	**0,50**	0,85	0,38	**0,36**	0,61	0,28	**0,27**	0,45	0,25	**0,24**	0,40	0,23	**0,22**	0,36	RDHT-TX
RDMT-TX	0,53	**0,63**	1,06	0,38	**0,46**	0,76	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

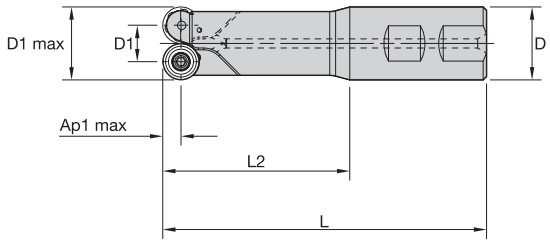
At 0,75 Axial Depth of Cut (ap)

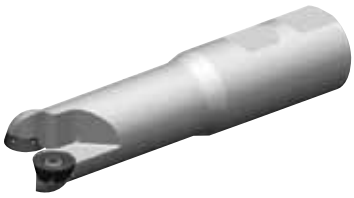
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,72	**0,69**	1,16	0,52	**0,50**	0,83	0,39	**0,37**	0,62	0,34	**0,32**	0,54	0,31	**0,30**	0,50	RDHT-TX
RDMT-TX	0,72	**0,87**	1,46	0,52	**0,62**	1,04	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.

- General purpose face and copy milling.
- Anti-rotation feature for top security.







Weldon Shanks

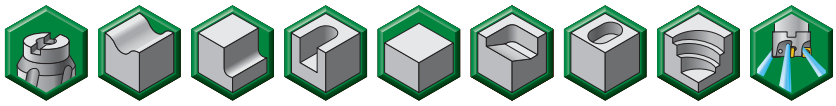
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021341	**12391013800**	32	16	32	142	82	8,0	2	7.8°	19000	Yes	1,10

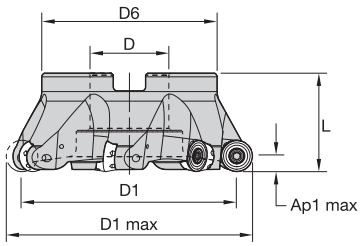
Spare Parts

D1 max	insert screw	Nm	Torx driver
32	**12148007200**	4,0	**12148007500**

NOTE: All spare parts except the insert screws must be ordered separately.

- General purpose face and copy milling.
- Anti-rotation feature for top security.





Shell Mills

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

Spare Parts

D1 max	 insert screw	 Nm	 Torx driver	 socket-head cap screw	 socket-head cap screw with coolant groove
50	**12148007200**	4,0	**12148007500**	**125.025**	**MS1234CG**
63	**12148007200**	4,0	**12148007500**	**125.230**	**MS2038CG**
80	**12148007200**	4,0	**12148007500**	**125.230**	**MS2038CG**
100	**12148007200**	4,0	**12148007500**	–	–
125	**12148007200**	4,0	**12148007500**	–	–

NOTE: All spare parts except the insert screws must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	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	TN7525	**RDMT-TX**	**TN7535**	RDMT-TX	TN7535
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**	**TN7535**	RDMW-TX	TN7535
K3	RDMW-TX	TN2510	**RDMW-TX**	**TN7535**	RDMW-TX	TN7535
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**	–	–

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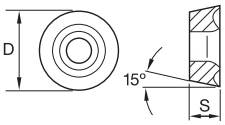
RDMT-TX


RDHT-TX



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

● first choice
○ alternate choice

- Precision ground positive geometry for lower cutting forces
- First choice for general machining, stainless steel, and high-temp alloys.

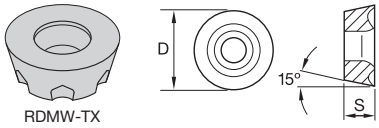
RDHT-TX

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDHT1605M0TX	16,00	5,56	0,12	▪	▪	▪	▪	▪	2012462

- Precision pressed positive geometry for lower cutting forces.
- First choice for general machining, stainless steel, and high-temp alloys in roughing operations.

RDMT-TX

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDMT1605M0TX	16,00	5,56	0,18	▪	2957536	2957533	2020767	2207645	▪



RDMW-TX

- Precision pressed insert.
- First choice for roughing operations, especially for steel and cast iron.

● first choice
○ alternate choice

		TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
P		○	●	●	●	●	●
M			○	●	○	○	○
K		●	○	○		○	
N							
S				●			
H		●					

■ RDMW-TX

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535	TTI25
RDMW1605M0TX	16,00	5,56	0,15	-	-	3523083	2109476	2020749	-

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6525			TN6540			TN7525			TN7535			TTI25		
P	1	660	**580**	540	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445	430	**360**	300
	2	410	**370**	330	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275	310	**250**	215
	3	370	**330**	305	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245	310	**250**	215
	4	275	**260**	230	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190	265	**215**	180
	5	330	**300**	275	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250	320	**235**	200
	6	230	**205**	175	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130	145	**110**	90
M	1	270	**240**	210	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185	480	**310**	215
	2	245	**210**	190	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170	325	**205**	145
	3	190	**175**	150	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140	320	**210**	145
K	1	420	**360**	300	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290	220	**185**	155
	2	360	**300**	250	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230	180	**145**	125
	3	300	**250**	200	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190	145	**125**	100
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00 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%			
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 4,00 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%			
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 2,00 Axial Depth of Cut (ap)

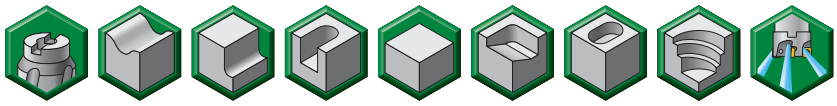
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,17	**0,53**	1,06	0,13	**0,38**	0,76	0,09	**0,28**	0,57	0,08	**0,25**	0,50	0,08	**0,23**	0,45	RDHX-TX
RDMT-TX	0,35	**0,63**	1,28	0,25	**0,46**	0,92	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

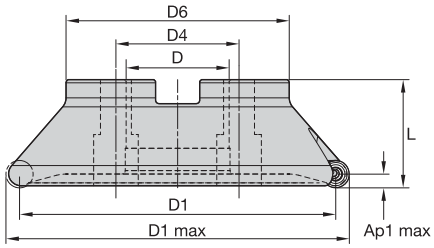
At 1,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
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.

- General purpose face and copy milling.
- Anti-rotation feature for top security.





Shell Mills

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
2021356	**12391022800**	200	184	60	102	130	63	8,0	11	0.8°	6000	No	0,30

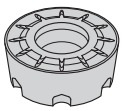
Spare Parts

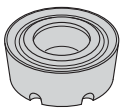
D1 max	 insert screw	 Nm	 Torx driver	 socket-head cap screw	 socket-head cap screw with coolant groove
50	**12148007200**	4,0	**12148007500**	**125.025**	**MS1234CG**
52	**12148007200**	4,0	**12148007500**	**125.025**	**MS1234CG**
63	**12148007200**	4,0	**12148007500**	**125.230**	**MS2038CG**
66	**12148007200**	4,0	**12148007500**	**125.230**	**MS2038CG**
80	**12148007200**	4,0	**12148007500**	**125.230**	**MS2038CG**
100	**12148007200**	4,0	**12148007500**	–	–
125	**12148007200**	4,0	**12148007500**	–	–
160	**12148007200**	4,0	**12148007500**	–	–
200	**12148007200**	4,0	**12148007500**	–	–

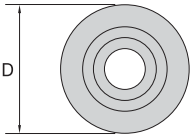
NOTE: All spare parts except the insert screws must be ordered separately.

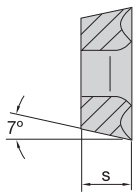
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	...TX	TN6525	**...43**	**TN6540**	...43	TN6540
P3–P4	...TX	TN6525	**...TX**	**TN6540**	...43	TN6540
P5–P6	...TX	TN6525	**...TX**	**TN7535**	...TX	TN7535
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	...43	TN6540	**...TX**	**TN6540**	...TX	TN6540
H1	–	–	**...TX**	**TN2510**	–	–


RCMT-43


RCMT-TX





● first choice
○ alternate choice

		TN2510	TN6525	TN6540	TN7525	TN7535
P		○	●	●	●	●
M			○	●	○	○
K		●	○	○		○
N						
S				●		
H		●				

- Optimised geometry providing excellent chip control, even at lower depth of cut.

RCMT-43

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535
RCMT1606M043M	16,00	6,35	0,20	■	■	2957537	2020771	2067140

- Precision pressed positive geometry for lower cutting forces.
- First choice for general machining, stainless steel, and high-temp alloys in roughing operations.

RCMT-TX

catalogue number	D	S	hm	TN2510	TN6525	TN6540	TN7525	TN7535
RCMT1606M0TX	16,00	6,35	0,24	2012416	2957535	2957427	2012418	2020781

Recommended Starting Speeds [m/min]

Material Group		TN2510			TN6525			TN6540			TN7525			TN7535			WK15CM		
P	1	660	**580**	540	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445	–	**–**	–
	2	410	**370**	330	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275	–	**–**	–
	3	370	**330**	305	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245	–	**–**	–
	4	275	**260**	230	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190	–	**–**	–
	5	330	**300**	275	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250	–	**–**	–
	6	230	**205**	175	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130	–	**–**	–
M	1	270	**240**	210	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185	–	**–**	–
	2	245	**210**	190	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170	–	**–**	–
	3	190	**175**	150	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140	–	**–**	–
K	1	420	**360**	300	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290	505	**460**	410
	2	360	**300**	250	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230	400	**355**	330
	3	300	**250**	200	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190	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	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 8,00 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%			
...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 4,00 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%			
...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 2,00 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%			
...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 1,00 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%			
...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.

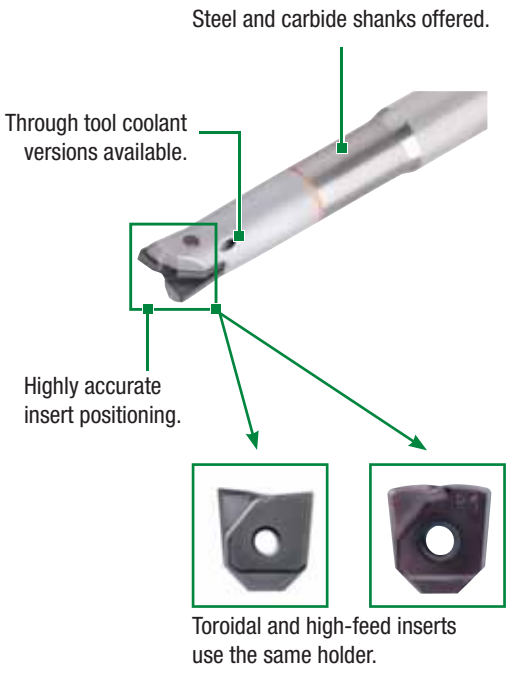
For Secure and Rigid Insert Clamping •

M270™ Series

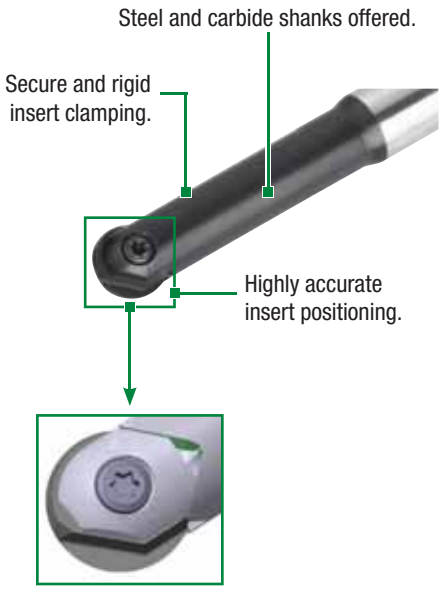
M270

With precision-engineered ball nose, toroidal, and new high-feed inserts, the M270 Series provides the highest accuracy and insert stability for exceptional reliability and performance.

- Ball nose and toroidal tools for semi-finishing through finishing.
- Performance-boosting High-Feed (HF) inserts offered standard.
- V-shaped contact faces enable maximum stability and accuracy.

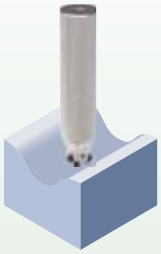


Toroidal and high-feed inserts use the same holder.



Two contact faces in V-shape provide more insert rigidity and accuracy.

Copy Mills

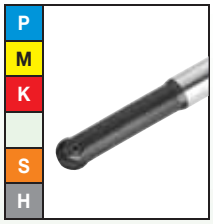


M270™ Ball Nose

Max depth of cut: 5–16mm

Diameter: 10–32mm

Pages: M102–M117

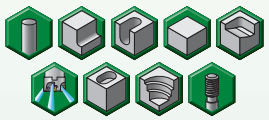


M270 Toroidal

Max depth of cut: 0,3–4mm

Diameter: 10–20mm

Pages: M118–M123

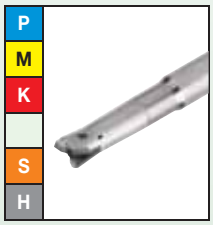


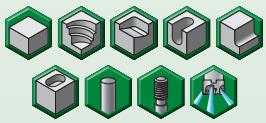
M270 High Feed

Max depth of cut: 0,6–1,1mm

Diameter: 10–20mm

Pages: M124–M130





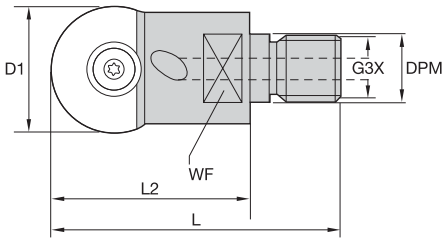
Insert Offering

Ball nose inserts
BF/BR

Toroidal inserts
TF

High-Feed inserts
HF

- Rough, semi-finishing, and finishing with one system.
- Through tool coolant.
- Secure and rigid insert clamping.



Ball Nose • Screw-On End Mills

order number	catalogue number	D1	DPM	G3X	L	L2	WF	Z	Z U	inserts	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

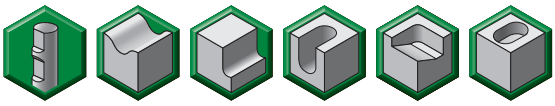
NOTE: ZU = Effective teeth.
Z = number of pocket seats.

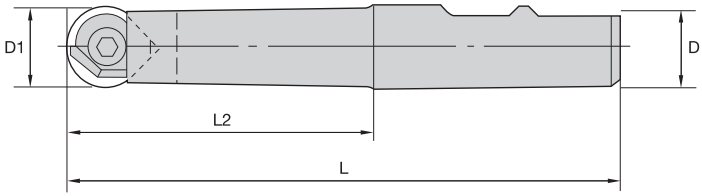
Spare Parts

D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**
25	**12748610900**	7,0	**12148086800**
32	**12748611000**	7,0	**12146006300**

NOTE: All spare parts except the insert screws must be ordered separately.

- Rough, semi-finishing, and finishing with one system.
- Secure and rigid insert clamping.





Ball Nose • Weldon® Shanks

order number	catalogue number	D1	D	L	L2	Z	Z U	inserts	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

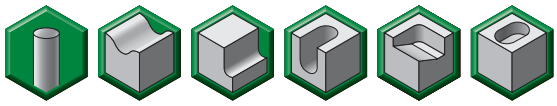
NOTE: ZU = Effective teeth.
Z = number of pocket seats.

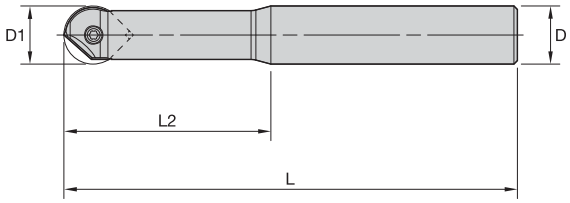
Spare Parts

D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**
25	**12748610900**	7,0	**12148086800**
32	**12748611000**	7,0	**12146006300**

NOTE: All spare parts except the insert screws must be ordered separately.

- Rough, semi-finishing, and finishing with one system.
- Secure and rigid insert clamping.





Ball Nose • Cylindrical Shanks

order number	catalogue number	D1	D	L	L2	Z	Z U	inserts	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

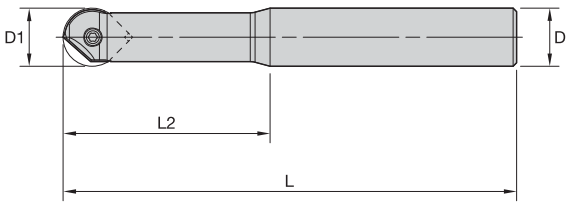
NOTE: ZU = Effective teeth.
Z = number of pocket seats.

Spare Parts

D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**
25	**12748610900**	7,0	**12148086800**
32	**12748611000**	7,0	**12146006300**

NOTE: All spare parts except the insert screws must be ordered separately.

- Rough, semi-finishing, and finishing with one system.
- Through tool coolant.
- Carbide shank to improve rigidity.



Ball Nose • Carbide Cylindrical Shanks

order number	catalogue number	D1	D	L	L2	Z	Z U	inserts	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.

Spare Parts

D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

Insert Selection Guide • .B..10

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN2505	**BR**	**TN7535**	BR	TN7535
P3–P4	BF	TN2505	**BR**	**TN7535**	BR	TN7535
P5–P6	BF	TN2505	**BR**	**TN7535**	BR	TN7535
M1–M2	BR	TN7535	**BR**	**TN7535**	BR	TN7535
M3	BR	TN7535	**BR**	**TN7535**	BR	TN7535
K1–K2	BF	TN2505	**BR**	**TN7535**	BR	TN7535
K3	BF	TN2505	**BR**	**TN7535**	BR	TN7535
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	BF	TN2505	**BF**	**TN2505**	–	TN2510

Insert Selection Guide • .B..12

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN2505	**BR**	**TN7535**	BR	TN7535
P3–P4	BF	TN2505	**BR**	**TN7535**	BR	TN7535
P5–P6	BF	TN2505	**BR**	**TN7535**	BR	TN7535
M1–M2	BR	TN7535	**BR**	**TN7535**	BR	TN7535
M3	BR	TN7535	**BR**	**TN7535**	BR	TN7535
K1–K2	BF	TN2505	**BR**	**TN2510**	BR	TN7535
K3	BF	TN2505	**BR**	**TN2510**	BR	TN7535
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	–	–	–	–	–	–
H1	BF	TN2505	**BF**	**TN2505**	BR	TN2510

Insert Selection Guide • .B..16

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN6525	**BR**	**TN7535**	BR	TN7535
P3–P4	BF	TN6525	**BR**	**TN7535**	BR	TN7535
P5–P6	BF	TN6525	**BR**	**TN7535**	BR	TN7535
M1–M2	BF	TN6525	**BF**	**TN6525**	BR	TN7535
M3	BF	TN6525	**BF**	**TN6525**	BR	TN7535
K1–K2	BF	TN2505	**BR**	**TN7535**	BR	TN7535
K3	BF	TN2505	**BR**	**TN7535**	BR	TN7535
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	–	–	–	–	–	–
S3	–	–	–	–	–	–
S4	BF	TN2505	–	–	–	–
H1	BF	TN2505	**BF**	**TN2505**	BR	TN2510

Insert Selection Guide • .B..20

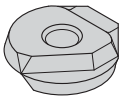
Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN6540	**BF**	**TN6540**	BF	TN6540
P3–P4	BF	TN6540	**BF**	**TN6540**	BF	TN7535
P5–P6	BF	TN6540	**BF**	**TN7535**	BF	TN7535
M1–M2	BF	TN6540	**BF**	**TN6540**	BF	TN7535
M3	BF	TN6540	**BF**	**TN6540**	BF	TN7535
K1–K2	BR	TN2505	**BR**	**TN2505**	–	–
K3	BR	TN2505	**BR**	**TN2505**	–	–
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**BF**	**TN6540**	–	–
S3	–	–	**BF**	**TN6540**	–	–
S4	–	–	**BF**	**TN6540**	–	–
H1	–	–	**BR**	**TN2505**	–	TN2510

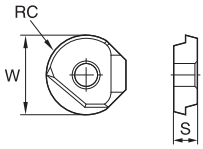
Insert Selection Guide • .B..25

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN2510	**BR**	**TN7525**	BR	TN7535
P3–P4	BF	TN2510	**BR**	**TN7525**	BR	TN7535
P5–P6	BF	TN2510	**BR**	**TN7525**	BR	TN7535
M1–M2	BF	TN2510	**BF**	**TN2510**	BR	TN7535
M3	BF	TN2510	**BF**	**TN2510**	BR	TN7535
K1–K2	BF	TN2510	**BF**	**TN2510**	BR	TN7535
K3	BF	TN2505	**BF**	**TN2510**	BR	TN7535
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	BF	TN2510	**–**	**–**	–	–
S3	BF	TN2510	**–**	**–**	–	–
S4	BF	TN2505	**BR**	**TN7535**	–	–
H1	BF	TN2505	**BF**	**TN2510**	BR	TN2510

Insert Selection Guide • .B..32

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	BF	TN2510	**BR**	**TN7525**	BR	TN7535
P3–P4	BF	TN2510	**BR**	**TN7525**	BR	TN7535
P5–P6	BF	TN2510	**BR**	**TN7525**	BR	TN7535
M1–M2	BF	TN2510	**BF**	**TN2510**	BR	TN7535
M3	BF	TN2510	**BF**	**TN2510**	BR	TN7535
K1–K2	BF	TN2510	**BF**	**TN2510**	BR	TN7535
K3	BF	TN2505	**BF**	**TN2510**	BR	TN7535
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	BF	TN2510	**–**	**–**	–	–
S3	BF	TN2510	**–**	**–**	–	–
S4	BF	TN2505	**BR**	**TN7535**	–	–
H1	BF	TN2505	**BF**	**TN2510**	BR	TN2510


M270-BF



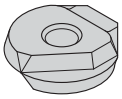
● first choice
○ alternate choice

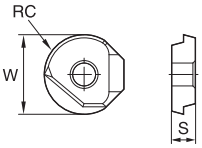
		TN2505	TN2510	TN6525	TN6540	TN7525	TN7535
P		○	○	●	●	●	●
M				○	●	○	○
K		●	●	○	○		○
N							
S					●		
H		●	●				

- -BF geometry is the first choice for all finishing and light operations.

■ M270 BF

catalogue number	W	S	RC	hm	TN2505	TN2510	TN6525	TN6540	TN7525	TN7535
M270BF10	10,00	2,38	5,00	0,08	2012698	2012700	■	■	■	■
M270BF12	12,00	3,18	6,00	0,08	2012718	2012720	2957538	■	■	■
M270BF16	16,00	4,76	8,00	0,08	2012728	2012730	2957541	■	■	■
M270BF20	20,00	4,76	10,00	0,10	2012748	2012750	2957542	■	■	■
M270BF25	25,00	4,76	12,50	0,10	2012758	2012760	■	■	■	■
M270BF32	32,00	4,76	16,00	0,10	2012778	2012780	■	■	■	■


M270-BR



- -BR geometry is the first choice for all semi-finishing and medium-duty applications.

● first choice
○ alternate choice

		TN2505	TN2510	TN6525	TN6540	TN7525	TN7535
P		○	○	●	●	●	●
M				○	●	○	○
K		●	●	○	○		○
N							
S					●		
H		●	●				

■ M270 BR

catalogue number	W	S	RC	hm	TN2505	TN2510	TN6525	TN6540	TN7525	TN7535
M270BR10	10,00	2,38	5,00	0,08	-	2012610	-	-	2012612	2012624
M270BR12	12,00	3,18	6,00	0,08	-	2012630	-	2957539	2012632	2012634
M270BR16	16,00	4,76	8,00	0,08	-	2012640	-	2957540	2012642	2113506
M270BR20	20,00	4,76	10,00	0,10	-	2012658	-	2957543	2012660	2012662
M270BR25	25,00	4,76	12,50	0,10	-	2012668	-	-	2012670	2012672
M270BR32	32,00	4,76	16,00	0,10	-	2012688	-	-	2012690	2012692

Recommended Starting Speeds [m/min]

Material Group		TN2505			TN2510			TN6525			TN6540		
P	1	550	**420**	360	660	**580**	540	410	**320**	280	360	**280**	240
	2	320	**240**	205	410	**370**	330	320	**250**	215	250	**190**	170
	3	320	**240**	205	370	**330**	305	280	**215**	185	215	**170**	140
	4	–	**–**	–	275	**260**	230	235	**170**	145	180	**130**	110
	5	–	**–**	–	330	**300**	275	310	**235**	200	240	**180**	150
	6	–	**–**	–	230	**205**	175	205	**160**	130	160	**120**	100
M	1	–	**–**	–	270	**240**	210	190	**120**	80	130	**80**	60
	2	–	**–**	–	245	**210**	190	120	**80**	50	80	**50**	40
	3	–	**–**	–	190	**175**	150	125	**80**	55	85	**50**	40
K	1	400	**300**	250	420	**360**	300	275	**245**	220	220	**205**	180
	2	540	**365**	280	360	**300**	250	215	**190**	180	175	**155**	140
	3	310	**190**	155	300	**250**	200	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	145	**110**	70	–	**–**	–	–	**–**	–
	2	175	**140**	95	145	**110**	70	–	**–**	–	–	**–**	–
	3	140	**115**	80	115	**80**	45	–	**–**	–	–	**–**	–

Material Group		TN7525			TN7535			TTI25		
P	1	410	**310**	280	545	**475**	445	430	**360**	300
	2	310	**250**	215	335	**305**	275	310	**250**	215
	3	280	**215**	185	305	**275**	245	310	**250**	215
	4	235	**170**	145	230	**210**	190	265	**215**	180
	5	310	**235**	200	310	**275**	250	320	**235**	200
	6	205	**160**	130	190	**160**	130	145	**110**	90
M	1	245	**220**	185	245	**220**	185	480	**310**	215
	2	220	**190**	170	220	**190**	170	325	**205**	145
	3	175	**155**	140	175	**155**	140	320	**210**	145
K	1	380	**280**	240	355	**320**	290	220	**185**	155
	2	325	**240**	200	280	**250**	230	180	**145**	125
	3	240	**200**	170	235	**210**	190	145	**125**	100
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.

■ Recommended Starting Feeds [mm] • .B..10

Light Machining	General Purpose	Heavy Machining

At 4,76 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 2,38 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 1,19 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 0,60 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.

Recommended Starting Feeds [mm] • .B..12

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%			
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 2,50 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%			
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 1,25 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%			
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 0,63 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%			
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.

■ Recommended Starting Feeds [mm] • .B..16

Light Machining	General Purpose	Heavy Machining

At 8,00 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%			
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 4,00 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%			
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 2,00 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%			
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 1,00 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%			
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.

Recommended Starting Feeds [mm] • .B..20

Light Machining	General Purpose	Heavy Machining

At 10,00 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%			
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 5,00 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%			
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 2,50 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%			
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 1,25 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%			
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.

■ Recommended Starting Feeds [mm] • .B..25

Light Machining	General Purpose	Heavy Machining

At 12,50 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%			
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 6,25 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%			
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 3,13 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 1,56 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.

Recommended Starting Feeds [mm] • .B..32

Light Machining	General Purpose	Heavy Machining

At 16,00 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%			
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 8,00 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%			
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 4,00 Axial Depth of Cut (ap)

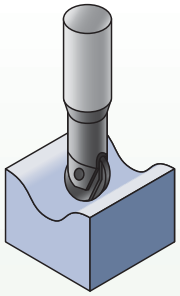
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
BF	0,26	**0,46**	0,72	0,19	**0,33**	0,51	0,14	**0,25**	0,38	0,12	**0,21**	0,33	0,11	**0,20**	0,30	BF
BR	0,35	**0,57**	0,92	0,25	**0,41**	0,64	0,19	**0,30**	0,48	0,17	**0,26**	0,41	0,15	**0,24**	0,38	BR

At 2,00 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%			
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

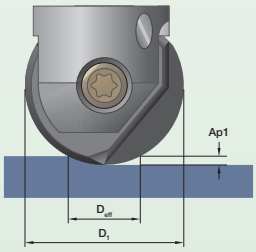


1. Insert Style: Considerations for Selecting the Correct Insert

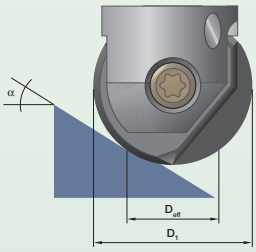
Best Choices for Insert and Grade Selection ● First choice ○ Alternate choice	BR Geometry		BF Geometry
			
Grade	TN7535	TN2510	TN2505
Roughing Operation	●	○	
Finishing Operation		○	●
Low RPM Machine	●	○	
Flat Areas or Face Milling (≤10° inclination)	●	○	
Hard Machining		○	●
Unstable and/or Long Overhangs	●	○	
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.



$$Deff = \sqrt{D1^2-(D1-2Ap1)^2}$$

$$k = \frac{1}{\sin\left[\alpha + \arccos\left(1-(2\,(Ap1/D1))\right)\right]}$$

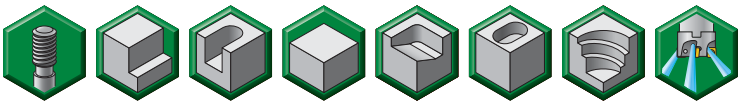
$$v_c eff = v_c \times k$$

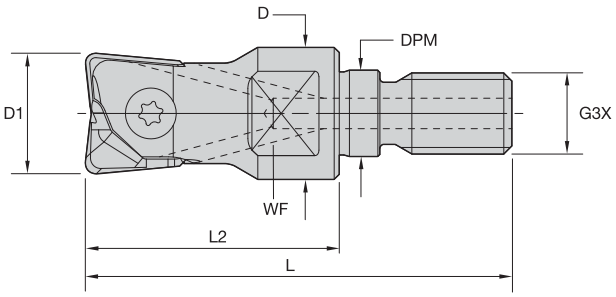
Starting Values for Semi-Finishing in Common Material Types (L/D ratio <3 x D1)

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
Grey 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

- Semi-finishing and finishing applications.
- Through tool coolant.
- Secure and rigid insert clamping.





Toroidal • Screw-On End Mills

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.

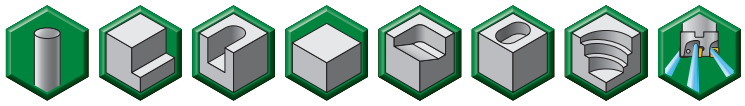
Spare Parts

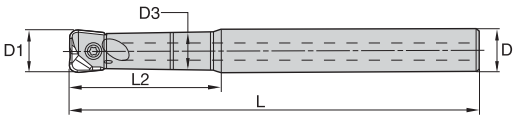


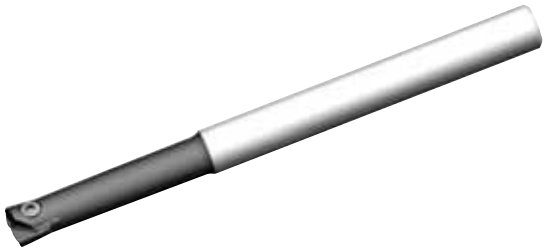
D1	insert screw	Nm	Torx driver
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

- Semi-finishing and finishing applications.
- Through tool coolant.
- Secure and rigid insert clamping.







Toroidal • Cylindrical Shanks

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.

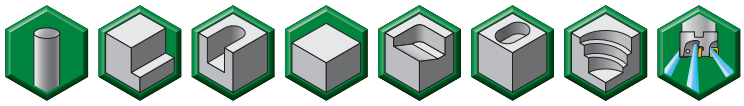
Spare Parts

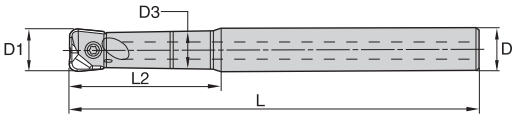


D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

- Semi-finishing and finishing applications.
- Through tool coolant.
- Carbide shank for higher rigidity.





Toroidal • Carbide Cylindrical Shanks

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.

Spare Parts

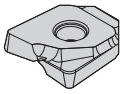


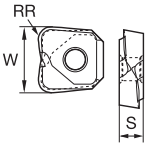
D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	TF	TN2510	**TF**	**TN2525**	TF	TN2525
P3–P4	TF	TN2510	**TF**	**TN2525**	TF	TN2525
P5–P6	TF	TN2510	**TF**	**TN2525**	–	–
M1–M2	TF	TN2510	–	–	–	–
M3	TF	TN2510	–	–	–	–
K1–K2	TF	TN2510	**TF**	**TN2525**	–	–
K3	TF	TN2510	**TF**	**TN2525**	–	–
N1–N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1–S2	TF	TN2510	–	–	–	–
S3	TF	TN2510	–	–	–	–
S4	TF	TN2510	–	–	–	–
H1	TF	TN2505	**TF**	**TN2510**	–	–


M270-TF



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

● first choice
○ alternate choice

- Precision insert for finishing and semi-finishing applications.
- Back draft design to minimise vibration and improve surface finishes.

M270 Toroidal

catalogue number	W	S	RR	hm	TN2505	TN2510	TN2525
M270TF10R05	10,00	2,38	0,50	0,08	-	3374385	3384424
M270TF10R1	10,00	2,38	1,00	0,08	2095682	-	2638760
M270TF12R05	12,00	3,18	0,50	0,08	-	3374387	3384426
M270TF12R1	12,00	3,18	1,01	0,08	-	3374388	3384427
M270TF12R2	12,00	3,18	2,01	0,08	2095640	-	2638761
M270TF16R03	16,00	4,76	0,30	0,08	-	3374389	3384428
M270TF16R05	16,00	4,76	0,50	0,08	-	3374390	3384429
M270TF16R1	16,00	4,76	1,01	0,08	-	3374391	3384430
M270TF16R2	16,00	4,76	2,02	0,08	-	3374392	3384431
M270TF16R3	16,00	4,76	3,04	0,08	-	-	2638762
M270TF20R03	20,00	4,76	0,30	0,08	-	3375713	-
M270TF20R05	20,00	4,76	0,50	0,08	-	3375714	3384453
M270TF20R1	20,00	4,76	1,01	0,08	-	-	3384454
M270TF20R2	20,00	4,76	2,01	0,08	-	3375716	3384455
M270TF20R4	20,00	4,76	4,02	0,08	-	-	2639023

NOTE: Ap1 max is equal to RR.

Recommended Starting Speeds [m/min]

Material Group		TN2505			TN2510			TN2525		
P	1	550	**420**	360	660	**580**	540	550	**420**	360
	2	320	**240**	205	410	**370**	330	320	**240**	205
	3	320	**240**	205	370	**330**	305	320	**240**	205
	4	–	**–**	–	275	**260**	230	–	**–**	–
	5	–	**–**	–	330	**300**	275	–	**–**	–
	6	–	**–**	–	230	**205**	175	–	**–**	–
M	1	–	**–**	–	270	**240**	210	–	**–**	–
	2	–	**–**	–	245	**210**	190	–	**–**	–
	3	–	**–**	–	190	**175**	150	–	**–**	–
K	1	400	**300**	250	420	**360**	300	–	**–**	–
	2	540	**365**	280	360	**300**	250	–	**–**	–
	3	310	**190**	155	300	**250**	200	–	**–**	–
N	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–
H	1	175	**140**	95	145	**110**	70	130	**90**	60
	2	175	**140**	95	145	**110**	70	130	**90**	60
	3	140	**115**	80	115	**80**	45	–	**–**	–

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

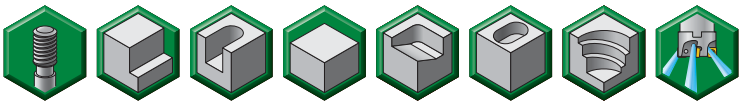
Recommended Starting Feeds [mm]

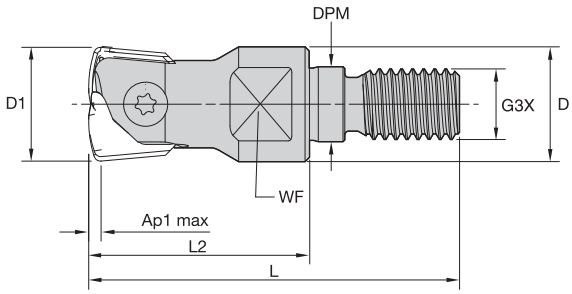
Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
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.

- High metal removal rates.
- Excellent in long reach applications.
- Rough and semi-finishing applications.





High-Feed • Screw-On End Mills

order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	Z U	insert 1	insert 2*	max RPM	coolant supply	kg
3926546	**M270TD012M08**	12	13	8,5	M8	42	25	10	0,6	1	2	M270HF12	M270HF13	55000	Yes	0,02
3926547	**M270TD016M08**	16	13	8,5	M8	47	30	10	0,9	1	2	M270HF16	M270HF17	53000	Yes	0,09
3926548	**M270TD020M10**	20	18	10,5	M10	59	40	14	1,1	1	2	M270HF20	—	52000	Yes	0,07

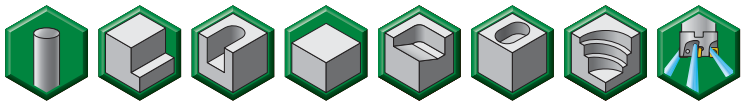
NOTE: ZU = Effective teeth.
Z = number of pocket seats.
**D1 = 13mm when using M270HF13; D1 = 17mm when using M270HF17.*

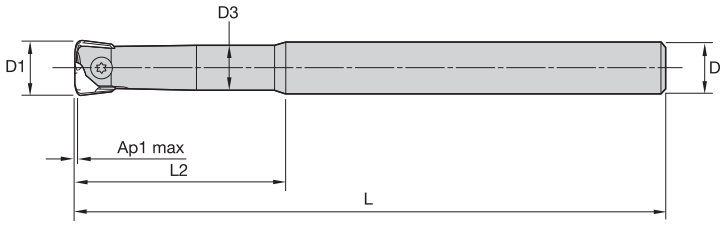
Spare Parts

D1	 insert screw	 Nm	 Torx driver
12	**12748610600**	2	**12148788900**
16	**12748610700**	5	**12148099300**
20	**12748610800**	5	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

- High metal removal rates.
- Excellent in long reach applications.
- Rough and semi-finishing applications.





High-Feed • Cylindrical Shanks

order number	catalogue number	D1	D	D3	L	L2	Ap1 max	Z	Z U	insert 1	insert 2*	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	M270HF13	55000	Yes	0,09
3926516	**M270TD016A16L160**	16	16	14	160	57	0,9	1	2	M270HF16	M270HF17	53000	Yes	0,19
3926517	**M270TD020A20L180**	20	20	18	180	70	1,1	1	2	M270HF20	–	52000	Yes	0,35

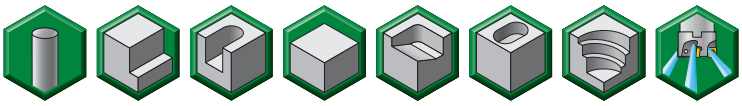
NOTE: ZU = Effective teeth.
Z = number of pocket seats.
**D1 = 13mm when using M270HF13; D1 = 17mm when using M270HF17.*

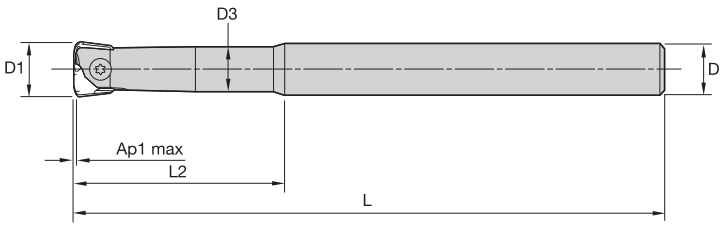
Spare Parts

D1	 insert screw	 Nm	 Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

- High metal removal rates.
- Excellent in long reach applications.
- Carbide shank for higher rigidity.





High-Feed • Carbide Cylindrical Shanks

order number	catalogue number	D1	D	D3	L	L2	Ap1 max	Z	Z U	insert 1	insert 2*	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	M270HF13	55000	Yes	0,15
3926521	**M270TD012A12L160C**	12	12	11	160	50	0,6	1	2	M270HF12	M270HF13	55000	Yes	0,22
3926522	**M270TD016A16L140C**	16	16	14	140	57	0,9	1	2	M270HF16	M270HF17	53000	Yes	0,32
3926543	**M270TD016A16L180C**	16	16	14	180	57	0,9	1	2	M270HF16	M270HF17	53000	Yes	0,44
3926544	**M270TD020A20L150C**	20	20	18	150	70	1,1	1	2	M270HF20	—	52000	Yes	0,52
3926545	**M270TD020A20L200C**	20	20	18	200	70	1,1	1	2	M270HF20	—	52000	Yes	0,74

NOTE: ZU = Effective teeth.
Z = number of pocket seats.
**D1 = 13mm when using M270HF13; D1 = 17mm when using M270HF17.*

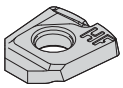
Spare Parts

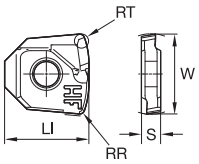
D1	insert screw	Nm	Torx driver
10	**12748610500**	2,0	**12148788900**
12	**12748610600**	2,0	**12148788900**
16	**12748610700**	5,0	**12148099300**
20	**12748610800**	5,0	**12148099300**

NOTE: All spare parts except the insert screws must be ordered separately.

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


M270-HF



- High-Feed geometry for roughing and semi-finishing applications at maximum feed rates.
- Exceptional stability, even when long overhang is required.

● first choice
○ alternate choice

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

High-Feed

catalogue number	W	LI	S	RR	RT	hm	TN2505	TN6525	TN6540
M270HF10	10,00	10,50	2,38	0,63	1,15	0,08	3903944	4145110	3903943
M270HF12	12,00	12,40	3,18	0,75	1,40	0,08	3903946	4145111	3903945
M270HF13	13,00	12,40	3,18	0,75	1,40	0,08	3903948	4145112	3903947
M270HF16	16,00	16,70	4,76	1,00	1,90	0,08	3903950	4145123	3903949
M270HF20	20,00	20,70	4,76	1,25	2,30	0,08	3903954	4145125	3903953

NOTE: RT = Programming radius.

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.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 0,60 Axial Depth of Cut (ap) • HF10

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

At 0,60 Axial Depth of Cut (ap) • HF12

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

At 0,60 Axial Depth of Cut (ap) • HF13

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
HF	0,94	**1,58**	2,82	0,64	**1,00**	1,49	0,46	**0,71**	1,03	0,40	**0,61**	0,88	0,37	**0,56**	0,80	HF

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

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 0,90 Axial Depth of Cut (ap) • HF16

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

At 0,90 Axial Depth of Cut (ap) • HF17

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
HF	1,06	**1,63**	3,00	0,71	**1,03**	1,52	0,51	**0,73**	1,05	0,44	**0,63**	0,90	0,40	**0,57**	0,82	HF

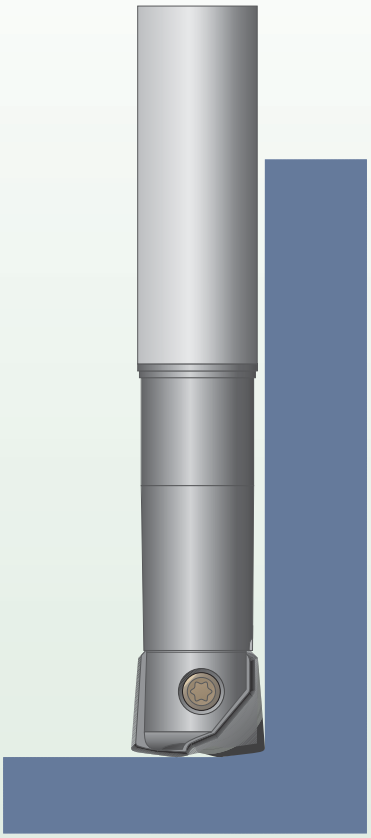
At 1,10 Axial Depth of Cut (ap) • HF20

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	**1,69**	2,74	0,69	**1,09**	1,57	0,50	**0,78**	1,10	0,44	**0,67**	0,94	0,40	**0,61**	0,86	HF

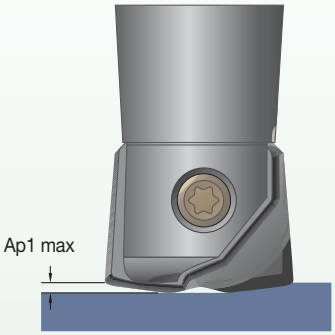
NOTE: Use "Light Machining" value as starting feed rate.

Applying High-Feed Tools

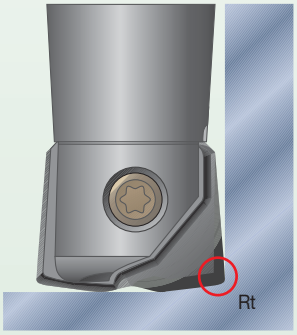
The high-feed concept bases its strategy in small depth of cut and high fz values, which results in a higher MRR and productivity with low radial forces.



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 centre cutting is possible, we recommend using a ramp angle of 0.5°–1.0° to ensure smooth operation.

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