



Indexable Milling

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Choosing the Correct Cutter

Find and Select the Right Milling Cutter

1. Identify material to be machined:

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

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

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

C Informational Icons. Connection type and possible operations.

3. Select product name

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

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



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

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

Determining Cutting Data

Selecting Tool Body, Insert, and Cutting Data

4. Choose the tool body:

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

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

Face Mills • M640 Series

M640 • Weldon® End Mills • Metric

order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2263165	1235405200	25	31.4	31	100	40	4.8	12	2000	Yes	0.35

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

- A Determine light machining, general purpose, or heavy machining according to workpiece material. See the Material Overview at the end of the catalog for material descriptions.
- B Select the grade given in the insert selection guide. Use the six-digit order number to easily place your order.

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
10-P-4	E, LD	WP25PM	E, GD	WP40PM	E, GD	WP40PM
10-P-6	E, LD	WP25PM	E, GD	WP40PM	E, GD	WP40PM
MT-M2	E, LD	WP25PM	E, GD	WP25PM	E, GD	WP25PM
M3	E, LD	WP40PM	E, GD	WP30PM	E, GD	WP30PM
KT-PK2	E, GD	TN6510	E, GD	WK15CM	E, GD	WK15CM
M1	E, LD	TN6520	E, GD	WP25PM	E, GD	WP25PM

catalogue number	cutting edges	D	S	R	Rm	THM	THM-LJ	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WP50PM
HPGT2550ZENGD	6	43.2	13.6	0.28	0.04										

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.

Material Group	TN6510		TN6520		TN6525		TN6540		WK15CM							
	1	2	1	2	1	2	1	2	1	2						
P	1	410	300	280	360	260	240	240	240	240						
	2	320	250	250	215	230	180	170	180	170						
	3	260	210	185	185	215	170	140	140	140						
	4	235	175	145	180	130	110	110	110	110						
	5	310	230	200	240	180	150	150	150	150						
M	1	190	120	80	130	80	60	60	60	60						
	2	120	80	50	80	50	40	40	40	40						
	3	125	80	55	85	50	40	40	40	40						
K	1	480	350	260	450	320	230	275	180	505	460	430				
	2	420	280	205	390	260	190	215	160	180	175	155	140	400	365	330
H	1	350	260	200	300	220	160	180	145	155	145	125	335	300	275	
	2	280	210	160	240	180	130	150	115	125	115	100	260	230	210	
S	1	50	35	30	50	35	30	50	35	30	50	35	30	50	35	30
	2	25	20	10	25	20	10	25	20	10	25	20	10	25	20	10
W	1	70	40	30	70	40	30	70	40	30	70	40	30	70	40	30
	2	60	30	25	60	30	25	60	30	25	60	30	25	60	30	25

M640 • Recommended Starting Feeds [mm]

Insert Geometry	Light Machining			General Purpose			Heavy Machining		
	5%	10%	20%	5%	10%	20%	5%	10%	20%
E-LD	0.13	0.24	0.47	0.15	0.25	0.34	0.07	0.12	0.16
E-LD	0.13	0.24	0.47	0.15	0.25	0.34	0.07	0.12	0.16
E-LD	0.13	0.24	0.47	0.15	0.25	0.34	0.07	0.12	0.16

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

Inserts • Catalog Numbering System

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

H		N		P		J				
Insert Shape		Insert Clearance Angle		Tolerance Class		Geometry and Clamping Type				
A		A	3°			symbol	hole	shape of hole	chipbreaker	shape of insert's section
B		B	5°			N	without		without	
C		C	7°			R	without		single-sided	
E		D	15°			F	without		double-sided	
H		E	20°			A	with	cylindrical hole	without	
L		F	25°			M	with	cylindrical hole	single-sided	
O		G	30°			G	with	cylindrical hole	double-sided	
R		N	0°			W	with	partly cylindrical hole, 40-60° countersink	without	
S		P	11°			T	with	partly cylindrical hole, 40-60° countersink	single-sided	
T						Q	with	partly cylindrical hole, 40-60° double countersink	without	
W						U	with	partly cylindrical hole, 40-60° double countersink	double-sided	
X	Special Design					B	with	partly cylindrical hole, 70-90° countersink	without	
						H	with	partly cylindrical hole, 70-90° countersink	single-sided	
						C	with	partly cylindrical hole, 70-90° double countersink	without	
						J	with	partly cylindrical hole, 70-90° double countersink	double-sided	
						X			special design	

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.

Inserts • Catalog Numbering System

(continued)

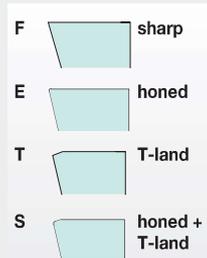
07
Size
(Cutting Edge Length)

04
Insert Thickness

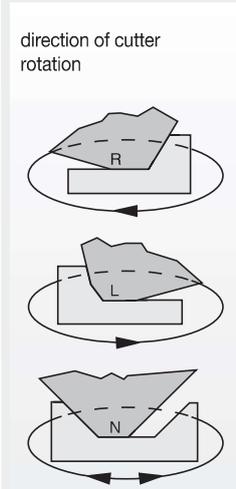
symbol	thickness
T1	1,98
02	2,38
03	3,18
04	4,76
05	5,56
06	6,35
07	7,94

AN
Corner
Configuration

S
Cutting Edge
Form



N
Insert Hand



GD
Edge
Geometry

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

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

radius					
MO	round insert				
01	0,1mm	If letter is replaced by number(s), refer to table for radius "r."	wiper edge clearance P		
02	0,2mm				
04	0,4mm				
05	0,5mm				
08	0,8mm				
10	1,0mm				
12	1,2mm			lead angle K	
15	1,5mm			A 45°	F 25°
16	1,6mm			D 60°	G 30°
24	2,4mm			E 75°	N 0°
32	3,2mm	P 90°	P 11°		

INDEXABLE MILLING

SOLID END MILLING

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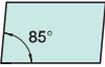
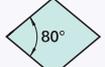
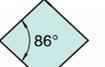
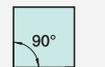
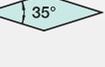
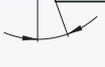
Tool Bodies • Catalog Numbering System

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

<p>M1200</p>	<p>D</p>	<p>100</p>	<p>Z</p>	<p>03</p>	<p>C</p>
<p>Series</p>	<p>Cutting Diameter</p>		<p>Number of Flutes</p>		<p>Shank Form</p>
			<p>Z = Number of effective flutes</p> 	<p>C = Cylindrical W = Weldon® M = Modular S = Shell Mill</p>	

Tool Bodies • Catalog Numbering System

(continued)

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)	
Optional uses as required								Optional uses as required			
<p>A </p> <p>B </p> <p>C </p> <p>D </p> <p>E </p> <p>H </p> <p>K </p> <p>L </p>		<p>M </p> <p>O </p> <p>P </p> <p>R </p> <p>S </p> <p>T </p> <p>V </p> <p>W </p> <p>X Special Design</p>		<p>C </p> <p>D </p> <p>E </p> <p>F </p> <p>G </p> <p>N </p> <p>P </p>		<p>LH Left Hand</p> <p>C Carbide Shank</p> <p>HM Heavy Metal Shank</p>					

INDEXABLE MILLING

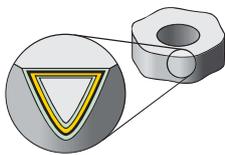
SOLID END MILLING

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Grades and Grade Descriptions



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

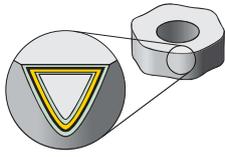
Each insert has a material grid indicating primary and alternate uses for that tool, as well as whether it can be operated dry or with coolant.

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 ₂ O 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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S	High-Temp Alloys
H	Hardened Materials

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

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

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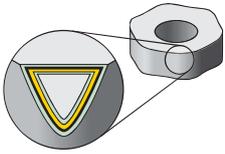
SOLID END MILLING

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Grades and Grade Descriptions



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

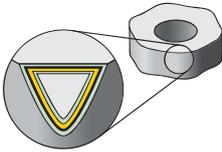
Each insert has a material grid indicating primary and alternate uses for that tool, as well as whether it can be operated dry or with coolant.

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
WK15PM				▼▼				•	•
PVD-TiAlN Nanolayer									
WK15CM™				▼▼				•	
MT-CVD/TiN-TiCN-Al ₂ O ₃									
WP20CM		▼▼		▼▼					
MT-CVD/TiN-TiCN-Al ₂ O ₃									
WP25PM		▼▼	▼▼	▼▼			▼▼	•	•
PVD-AlTiN Multilayer									
WS30PM™		▼▼	▼▼					•	•
PVD-AlTiN Multilayer									
WS40PM		▼	▼					•	•
PVD-TiAlN/TiN Multilayer									

Grades and Grade Descriptions



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

primary use		alternate use	
▽▽▽	Light (finishing)	▽▽▽	Light (finishing)
▽▽	Medium	▽▽	Medium
▽	Heavy (roughing)	▽	Heavy (roughing)

Grade		P	M	K	N	S	H	dry	with coolant
WU20PM		▽▽	▽▽	▽▽		▽▽		•	•
PVD-TiAlN									
WU35PM		▽	▽			▽		•	•
PVD-AlTiN Multilayer									
WP35CM		▽	▽	▽				•	
MT-CVD/TiN-TiCN-Al ₂ O ₃									
WP40PM™		▽	▽			▽		•	•
PVD TiAlN-AlCrN Multilayer									
WK25YM				▽▽				•	
Silicon Nitride									
WDN00U™					▽▽▽ ▽▽▽ ▽				•
Ultra-fine grain PCD									

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Face Milling Portfolio Overview

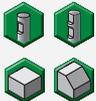
INDEXABLE MILLING

SOLID END MILLING

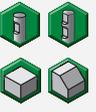
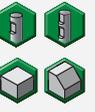
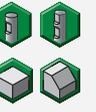
HOLEMAKING

TAPPING

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

Face Milling Portfolio Overview

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

 Good
  Perfect
  Yes
  No
  All-Star Program

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M640

M640 Face Mill

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



Through-tool coolant up to 80mm diameter.

One insert screw enables fast, accurate indexing.

Insert with six effective cutting edges.

Highly positive rake for low-power machines.

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

WIPER INSERT



P M K N S H



-GD

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



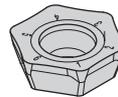
-3W

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

INSERT

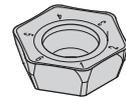


P M K N S H



-LD

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



-AL

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

LOW CUTTING FORCES, FINISHING OPERATIONS

PRODUCT

SERIES

M640

DIAMETER RANGE

32–125mm

SHANK TYPES

Weldon® End Mills
Shell Mills

INDUSTRY



APPLICATIONS



FACE
MILLING

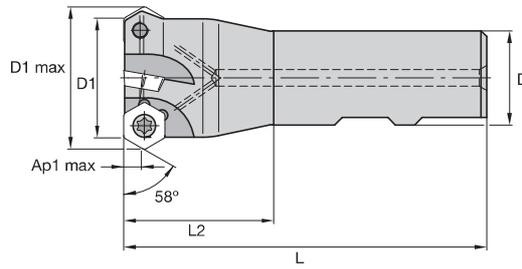
SLEEK FINISH

LOW CUTTING FORCES

Highly positive rake angle for extremely low cutting forces.

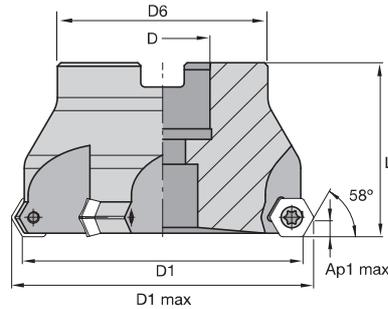


M640 • Weldon® End Mills • Metric



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

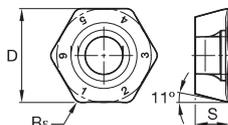
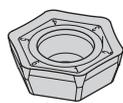
M640 • Shell Mills • Metric



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M640 • HPGT-GD

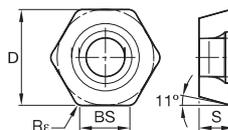


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	hm	THM	THM-U	TN6510	TN6520	TN6525	TN6540	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPGT06T3DZENGD	6	11	3,97	0,98	0,10	●	○	○	○	○	○	○	○	○	○	○

M640 • HPGT-GD Wiper



- first choice
- alternate choice

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

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

M640 • 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	WS40PM	.E..GD	WS40PM
P5-P6	.E..LD	WP25PM	.E..GD	WP25PM	.E..GD	WP25PM
M1-M2	.E..LD	WP25PM	.E..GD	WP25PM	.E..GD	WP25PM
M3	.E..LD	WP40PM	.E..GD	WS30PM	.E..GD	WS30PM
K1-K2	.E..GD	TN6510	.E..GD	WK15CM	.E..GD	WK15CM
K3	.E..LD	TN6520	.E..GD	WP25PM	.E..GD	WP25PM
N1-N2	.E..LD	WS40PM	.E..GD	WS40PM	.E..GD	WS40PM
N3	.E..LD	WS40PM	.E..GD	WS40PM	.E..GD	WS40PM

M640 • Recommended Starting Speeds [m/min]

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

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

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

M640 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

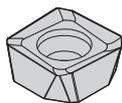
M660

M660 Face Mill

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



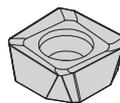
THREE CHIPBREAKERS FOR ALL HEAVY-DUTY APPLICATIONS IN STEEL AND CAST IRON



-20



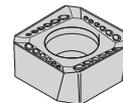
Light Machining



-21



General Purpose
Machining



-31



General Purpose
and Heavy Machining

HEAVY-DUTY FACE MILLING OF STEEL AND CAST IRON

PRODUCT

SERIES

M660

DIAMETER RANGE

20–160mm

SHANK TYPES

Shell Mills
Weldon® End Mills

INDUSTRY



APPLICATIONS

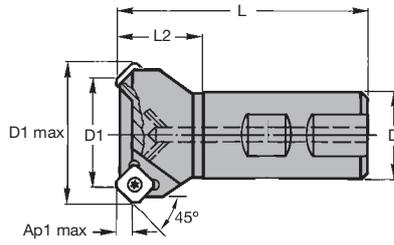


FACE
MILLING

**HEAVY
DUTY**

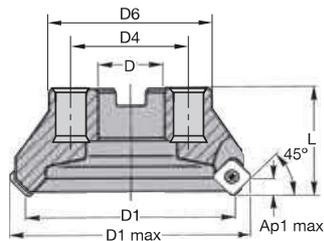


M660 • Weldon® Shank SN1205.. • Metric



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

M660 • Shell Mills SN1205.. • Metric

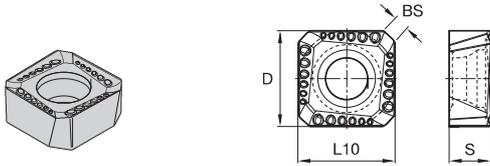


order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003541	12396203800	50	63,5	22	—	50	40	6,4	4	12500	Yes	0,45
2003558	12396204200	63	76,5	22	—	50	40	6,4	5	11000	Yes	0,60
2003575	12396204600	80	94,3	27	—	60	50	6,4	6	9900	Yes	1,15
2003582	12396205000	100	113,4	32	—	78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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

INDEXABLE MILLING

M660 • SNMT-31 • SN1205..



- first choice
- alternate choice

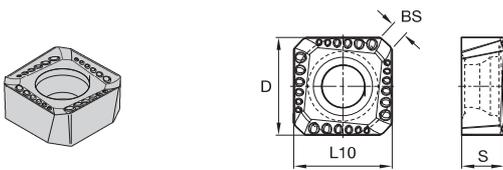
P	■	■	●	●	●	●	●	●	●	●
M	■	■	○	○	○	○	○	○	○	○
K	■	■	○	○	○	○	○	○	○	○
N	■	■	●	●	●	●	●	●	●	●
S	■	■	○	○	○	○	○	○	○	○
H	■	■	○	○	○	○	○	○	○	○

catalogue number	cutting edges	D	L10	S	BS	R _ε	hm	THM	TN6525	TN6540	TT125	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNMT1205AZR31	4	12,70	12,70	5,56	1,54	—	0,16	■	●	●	○	○	○	○	○	○

SOLID END MILLING

HOLEMAKING

M660 • SNKT-31 • SN1205..



- first choice
- alternate choice

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

catalogue number	cutting edges	D	L10	S	BS	hm	THM	TN6525	TN6540	TT125	TTM08	WK15CM	WP25PM	WP35CM	WP40PM
SNKT1205AZR31	4	12,70	12,70	5,56	1,54	0,16	■	●	●	○	○	○	○	○	○

TAPPING

TURNING

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

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

Material Group		WK15CM			WP40PM			TT125			THM		
P	1	-	-	-	355	310	295	430	360	300	-	-	-
	2	-	-	-	300	260	215	310	250	215	-	-	-
	3	-	-	-	275	235	190	310	250	215	-	-	-
	4	-	-	-	245	205	160	265	215	180	-	-	-
	5	-	-	-	205	185	160	320	235	200	-	-	-
	6	-	-	-	180	140	110	145	110	90	-	-	-
M	1	-	-	-	235	205	185	480	310	215	-	-	-
	2	-	-	-	210	180	150	325	205	145	-	-	-
	3	-	-	-	155	140	110	320	210	145	-	-	-
K	1	505	460	410	-	-	-	220	185	155	145	110	90
	2	400	355	330	-	-	-	180	145	125	150	120	85
	3	335	300	275	-	-	-	145	125	100	155	115	70
N	1	-	-	-	-	-	-	-	-	-	1080	720	600
	2	-	-	-	-	-	-	-	-	-	820	560	460
	3	-	-	-	-	-	-	-	-	-	540	335	240
S	1	-	-	-	50	40	35	-	-	-	-	-	-
	2	-	-	-	50	40	35	-	-	-	-	-	-
	3	-	-	-	60	50	35	-	-	-	-	-	-
	4	-	-	-	80	60	40	-	-	-	-	-	-
H	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-

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

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

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.

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

INDEXABLE MILLING

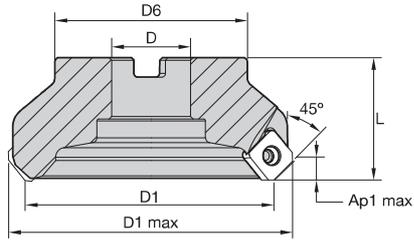
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M660 • Shell Mills SN1505..



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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

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

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

Material Group	WK15CM			WP40PM			TT125			THM			
P	1	-	-	-	355	310	295	430	360	300	-	-	-
	2	-	-	-	300	260	215	310	250	215	-	-	-
	3	-	-	-	275	235	190	310	250	215	-	-	-
	4	-	-	-	245	205	160	265	215	180	-	-	-
	5	-	-	-	205	185	160	320	235	200	-	-	-
	6	-	-	-	180	140	110	145	110	90	-	-	-
M	1	-	-	-	235	205	185	480	310	215	-	-	-
	2	-	-	-	210	180	150	325	205	145	-	-	-
	3	-	-	-	155	140	110	320	210	145	-	-	-
K	1	505	460	410	-	-	-	220	185	155	145	110	90
	2	400	355	330	-	-	-	180	145	125	150	120	85
	3	335	300	275	-	-	-	145	125	100	155	115	70
N	1	-	-	-	-	-	-	-	-	-	1080	720	600
	2	-	-	-	-	-	-	-	-	-	820	560	460
	3	-	-	-	-	-	-	-	-	-	540	335	240
S	1	-	-	-	50	40	35	-	-	-	-	-	-
	2	-	-	-	50	40	35	-	-	-	-	-	-
	3	-	-	-	60	50	35	-	-	-	-	-	-
	4	-	-	-	80	60	40	-	-	-	-	-	-
H	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-

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

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

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

M1600 Series

M1600, M1600 Mini-F Face Mills

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



M1600 MINI-F

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



M1600

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

M1600 MINI-F INSERTS

SEMI-FINISH INSERTS



WK15CM



WU10PM



WU20PM



WIPER INSERTS



THM-F



WU10PM



M1600 INSERTS

-MM



WK15CM



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

WP35CM



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

WU20PM



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

VERSATILE FACE MILL FOR ALL MACHINE CONDITIONS

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

APPLICATIONS



FACE
MILLING

INDUSTRY



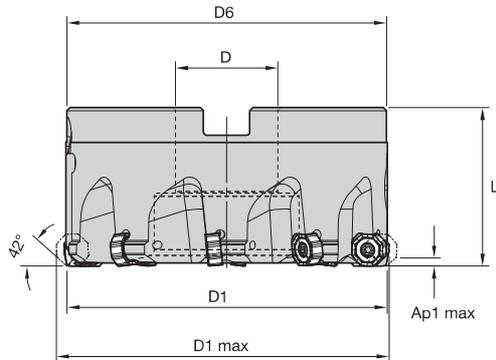
43°

LEAD ANGLE

redistributes cutting forces in the spindle z-axis direction.



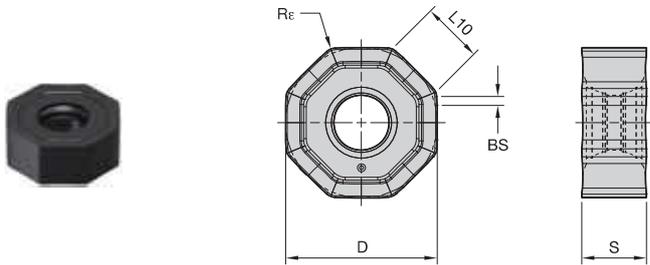
M1600 Mini-F • 42° • Shell Mills • Metric



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1600 Mini-F • ONGX-MM

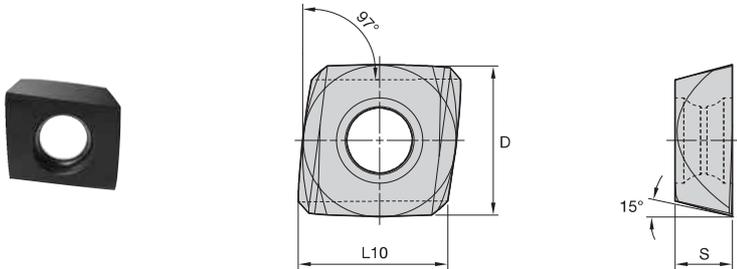


- first choice
- alternate choice

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

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

M1600 Mini-F • Wiper Inserts • XDHX-W2C



- first choice
- alternate choice

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

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

M1600 Mini-F • Insert Selection Guide

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

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

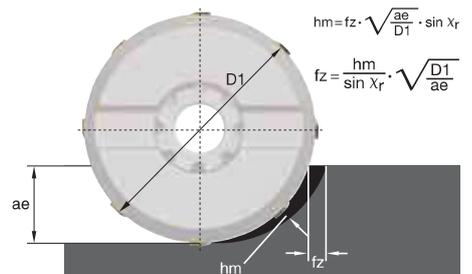
Material Group		WK15CM			WU10PM			WU20PM			THM-F		
P	1	-	-	-	-	-	-	330	290	270	-	-	-
	2	-	-	-	-	-	-	275	250	200	-	-	-
	3	-	-	-	-	-	-	255	220	175	-	-	-
	4	-	-	-	245	200	170	225	190	150	-	-	-
	5	-	-	-	-	-	-	185	175	150	-	-	-
	6	-	-	-	-	-	-	165	130	100	-	-	-
M	1	-	-	-	-	-	-	205	180	165	-	-	-
	2	-	-	-	-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

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

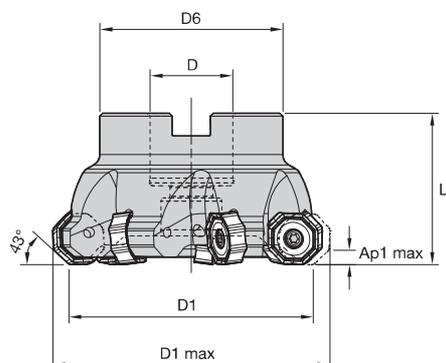
M1600 Mini-F • Recommended Starting Feeds [mm]

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

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



M1600 • 43° • Shell Mills • Metric



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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M1600 • ONGX-MM • General Purpose Face Milling

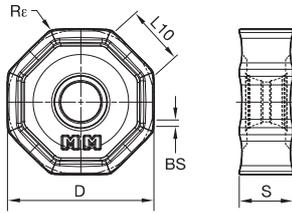
INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Re	hm			
ONGX060512ANSNMM	16	17	6,87	5,47	0,77	1,20	0,04	6072424	WK15CM	WP35CM
ONGX060512ANSNMM	16	17	6,87	5,47	0,77	1,20	0,06	6652431		3778942

M1600 • Insert Selection Guide

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

M1600 • Recommended Starting Speeds [m/min]

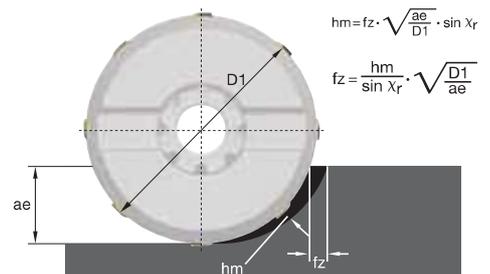
Material Group		WP35CM			WK15CM			WU20PM		
P	1	455	395	370	-	-	-	330	290	270
	2	280	255	230	-	-	-	275	250	200
	3	255	230	205	-	-	-	255	220	175
	4	190	175	160	-	-	-	225	190	150
	5	260	230	210	-	-	-	185	175	150
	6	160	135	110	-	-	-	165	130	100
M	1	205	185	155	-	-	-	205	180	165
	2	185	160	140	-	-	-	185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

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

M1600 • Recommended Starting Feeds [mm]

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

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



M1200 Series

M1200 Mini, M1200, M1200 Max Face Mills



M1200 MINI

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



M1200

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



M1200 MAX SCREW CLAMPING • FOR BIGGER STOCK REMOVAL

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

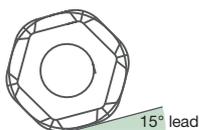


M1200 MAX WEDGE CLAMPING • FOR CAST IRON COMPONENTS

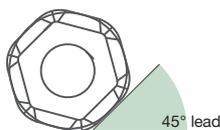
The M1200 Max wedge clamping is a 12-edged face mill for medium roughing - semi-finishing while running higher DOC (up to 7,5mm) in gray cast iron and nodular iron components.

ONE INSERT STYLE FITS INTO ALL DIFFERENT CUTTER BODY VERSIONS

M1200 &
M1200 MINI HF
High-Feed 15°



M1200 &
M1200 MINI
45°



M1200 &
M1200 MINI HD
60°



WIPER
(XNGJ)



3RH + 3LH

12-EDGED FACE MILL

PRODUCT		INSERTS			
SERIES	DIAMETER RANGE	GEOMETRY	GRADE	MATERIALS	
M1200 MINI HNPJ0905... - PRESSED AND SINTERED TO SIZE HNGJ0905... - PRECISION GROUND	25–125mm	LDJ — Machining Aluminum	WK15CM, WK25YM	K	
			WP35CM, WP25PM	P M S	
M1200 HNPJ0905... - PRESSED AND SINTERED TO SIZE HNGJ0905... - PRECISION GROUND	40–315mm	LD — Light Machining	WP40PM	P M	
			WS30PM	S	
M1200 MAX HNMU1107... - PRESSED AND SINTERED TO SIZE HNMF1107... - PRESSED AND SINTERED TO SIZE	63–250mm	GD — General Purpose	WS40PM	P M S	
			HD — Heavy Machining	TN6501, THM-U	N
			MM — Medium Machining	WK15CM, WP35CM, WU20PM	P M K

APPLICATIONS



WELDON®
SHANK



WELDON: 2
FLAT



FACE
MILLING

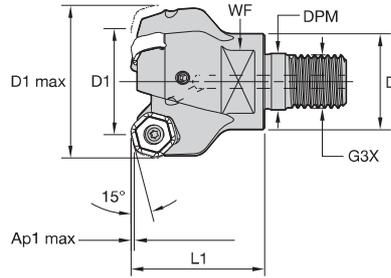


EASED
CHAMFER

INDUSTRY

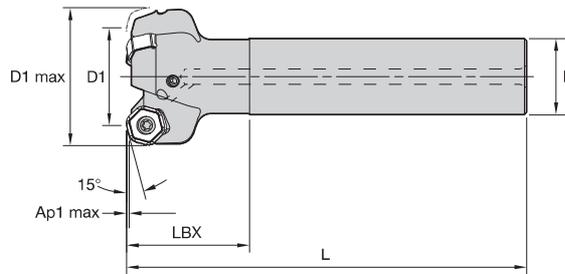


M1200 Mini • 15° • High Feed • Screw-On End Mills • Metric



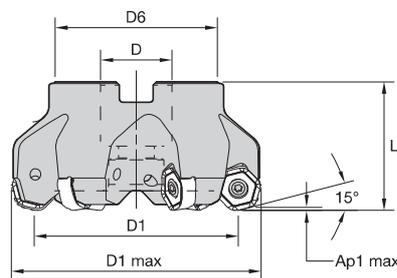
order number	catalogue number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	kg
4136875	M1200HF025Z03M16HN07	25	39	29	17,0	M16	32	22	1,7	3	20000	Yes	0,2

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



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

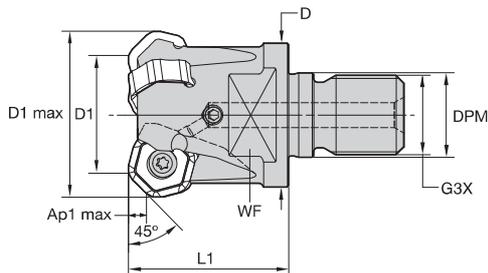
M1200 Mini • 15° • High Feed • Shell Mills • Metric



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

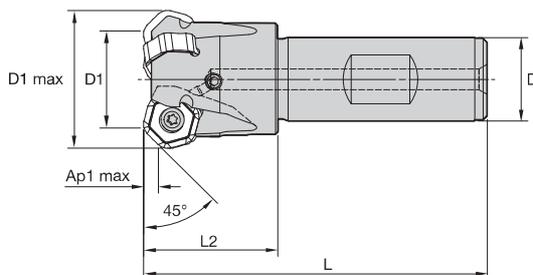
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

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



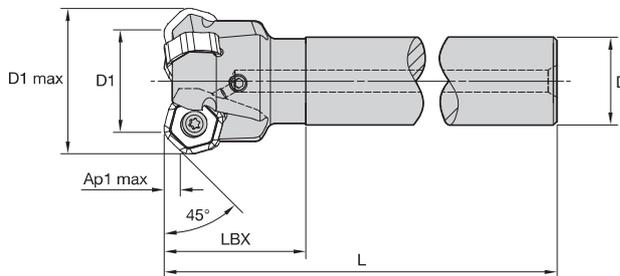
order number	catalogue number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	kg
3957840	M1200D025Z03M16HN07	25	33,7	29	17,0	M16	32	22	3,5	3	20000	Yes	0,13
3957841	M1200D032Z03M16HN07	32	40,7	29	17,0	M16	40	22	3,5	3	17600	Yes	0,20
3957842	M1200D032Z04M16HN07	32	40,7	29	17,0	M16	40	22	3,5	4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

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



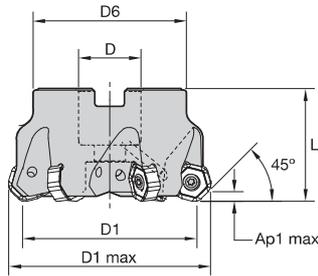
order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3958012	M1200D025Z03B20HN07	25	33,7	20	82	32	3,5	3	20000	Yes	0,21
3958023	M1200D032Z03B25HN07	32	40,7	25	97	40	3,5	3	17600	Yes	0,39
3958024	M1200D032Z04B25HN07	32	40,7	25	97	40	3,5	4	17600	Yes	0,40

M1200 Mini • 45° • Cylindrical Shank • Metric



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

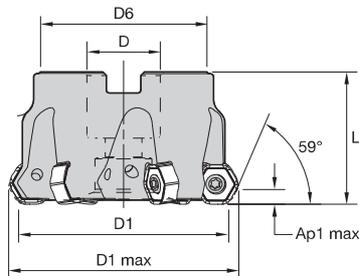
M1200 Mini • 45° • Shell Mills • Metric



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

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

M1200 Mini • 60° • Shell Mills • Metric

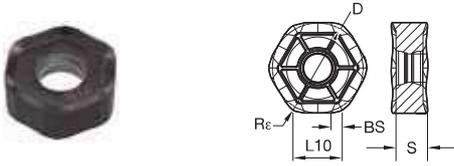


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136863	M1200HD040Z05HN07	40	46,8	22	38	40	4,7	5	15800	Yes	0,22
4136865	M1200HD050Z05HN07	50	56,8	22	38	40	4,7	5	12700	Yes	0,34
4136867	M1200HD063Z06HN07	63	69,8	22	50	40	4,7	6	10100	Yes	0,60
4136868	M1200HD080Z05HN07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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1200 Mini • HNPJ-GD • HN0704

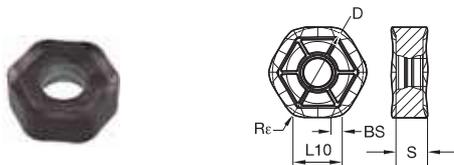


- first choice
- alternate choice

	P	M	K	N	S	H														
THM-U																				
TN6501																				
3954432																				
TN6510																				
TN6520																				
TN6525																				
TN6540																				
3954474																				
5427374																				
WK15CM																				
5895293																				
WP25PM																				
5895294																				
WP35CM																				
5550906																				
WP40PM																				
5528976																				
WS30PM																				
6180297																				
WS40PM																				

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

M1200 Mini • HNPJ-HD • HN0704

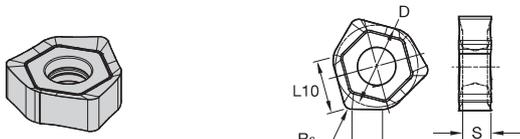


- first choice
- alternate choice

	P	M	K	N	S	H														
THM-U																				
TN6501																				
TN6510																				
TN6520																				
TN6525																				
TN6540																				
3954479																				
5427375																				
WK15CM																				
5895295																				
WP25PM																				
5895296																				
WP35CM																				
5895297																				
WP40PM																				
5550907																				
WS30PM																				
6180311																				
WS40PM																				

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

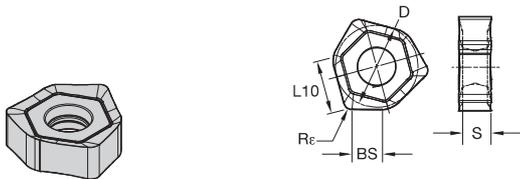
M1200 Mini • XNGJ-LDJ-3 Wiper • XN0704



- first choice
- alternate choice

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

M1200 Mini • XNGJ-LD3 Wiper • XN0704



- first choice
- alternate choice

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

M1200 Mini • 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

M1200 Mini • Recommended Starting Speeds [m/min]

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

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

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

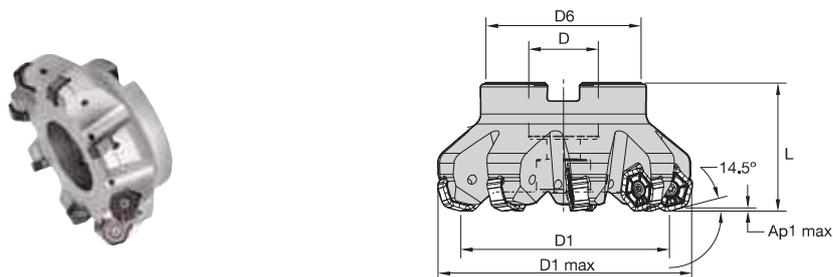
M1200 Mini • Recommended Starting Feeds [mm]

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

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

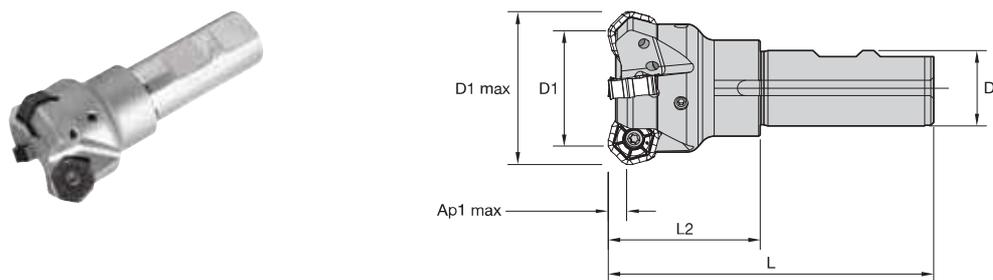
M1200 • 15° • High Feed • Shell Mills • Metric



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

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

M1200 • 45° • Weldon® End Mills • Metric

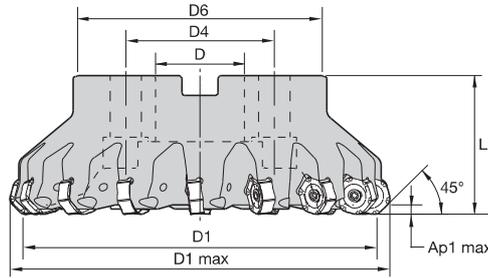


order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3325311	M1200D040Z04B25HN09	40	51,0	25	107	50	4,5	4	15800	Yes	0,52

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

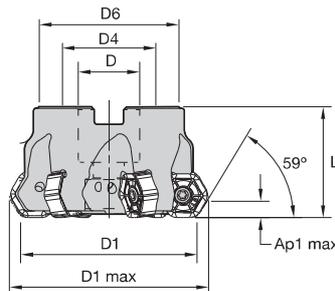
M1200 • 45° • Shell Mills • Metric



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

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

M1200 • 60° • Shell Mills • Metric



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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M1200 • Recommended Starting Speeds [m/min]

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

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

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

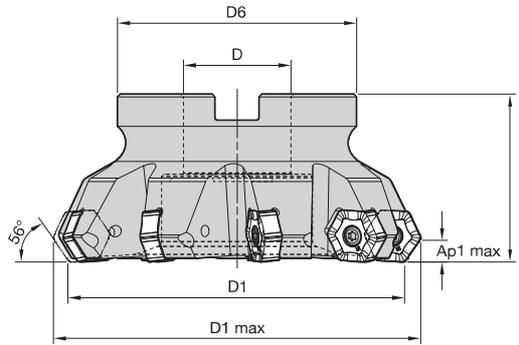
M1200 • Recommended Starting Feeds [mm]

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

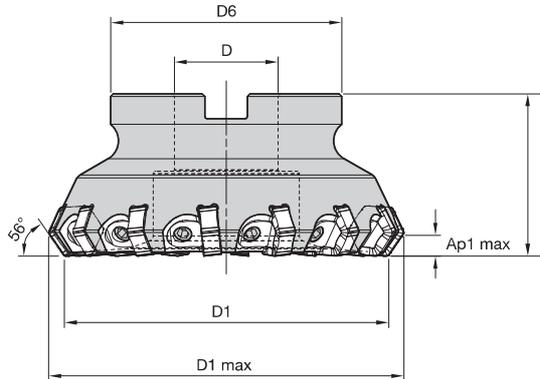
NOTE: Use "Light Machining" value as starting feed rate.

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



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

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

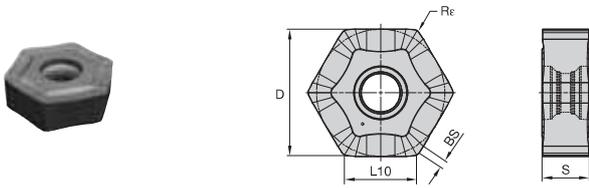


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6175726	M1200D063Z06S22HN11W	63	74,8	22	55	40	7,5	6	3600	No	0,56
6020535	M1200D080Z08S27HN11W	80	91,8	27	60	50	7,5	8	3100	No	1,17
6020523	M1200D100Z10S32HN11W	100	111,8	32	78	50	7,5	10	2700	No	1,73
6020530	M1200D125Z14S40HN11W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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

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

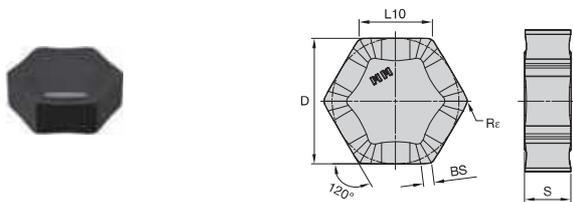


- first choice
- alternate choice

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

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

M1200 Max Wedge Clamping Inserts • HNMF-MM



- first choice
- alternate choice

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

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

M1200 Max • Insert Selection Guide

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

M1200 Max • Recommended Starting Speeds [m/min]

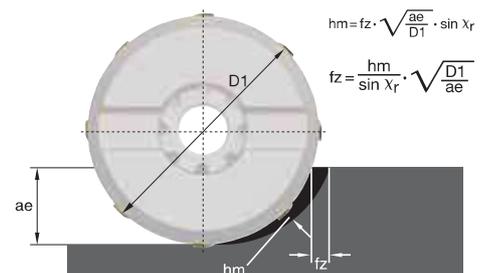
Material Group		WP35CM			WK15CM			WU20PM		
		1	2	3	1	2	3	1	2	3
P	1	455	395	370	—	—	—	330	290	270
	2	280	255	230	—	—	—	275	250	200
	3	255	230	205	—	—	—	255	220	175
	4	190	175	160	—	—	—	225	190	150
	5	260	230	210	—	—	—	185	175	150
	6	160	135	—	—	—	—	165	130	100
M	1	205	185	155	—	—	—	205	180	165
	2	185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

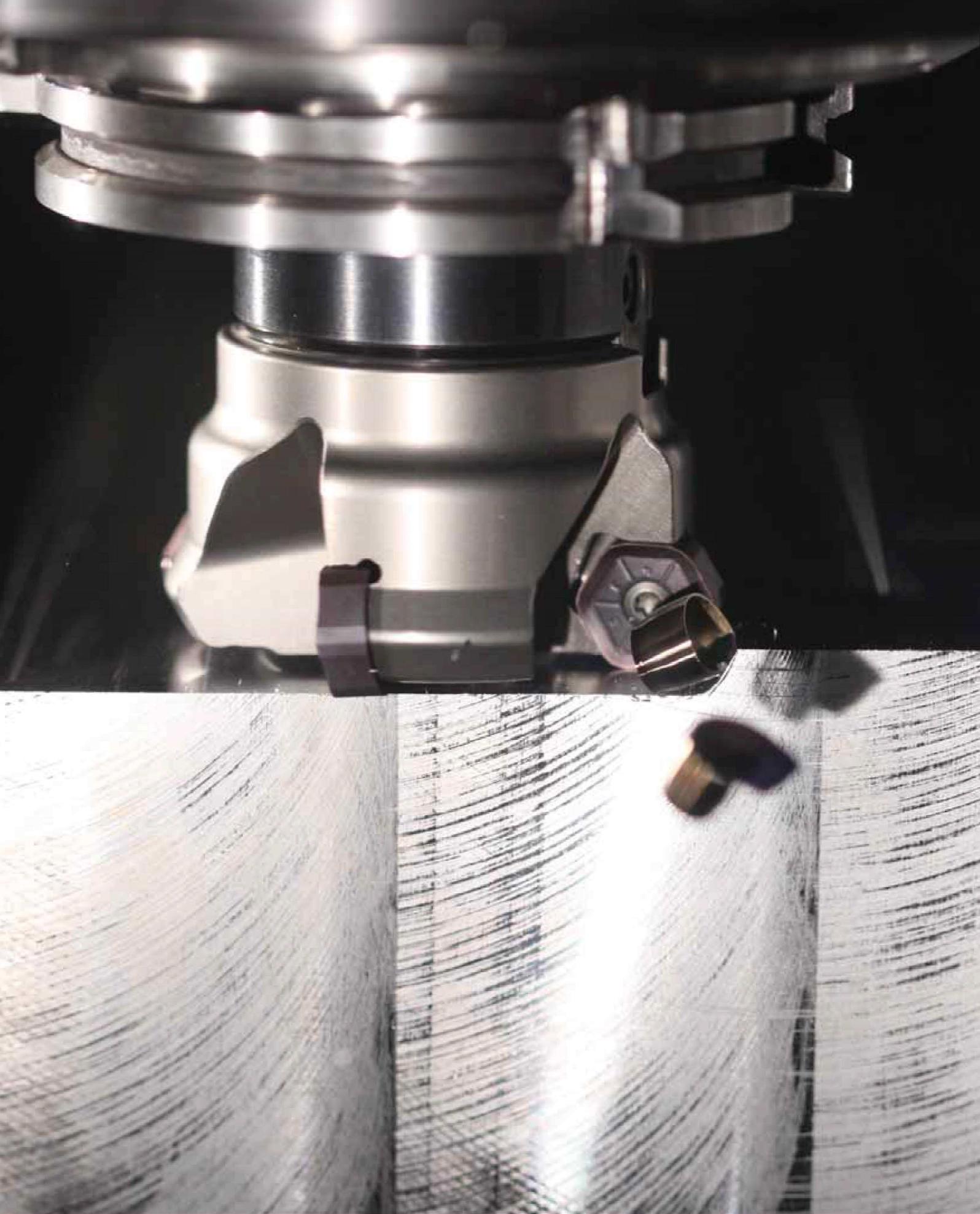
NOTE: First choice starting feed (fz) is in **bold** type.
As the average chip thickness increases, the speed should be decreased.

M1200 Max • Recommended Starting Feeds [mm]

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

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

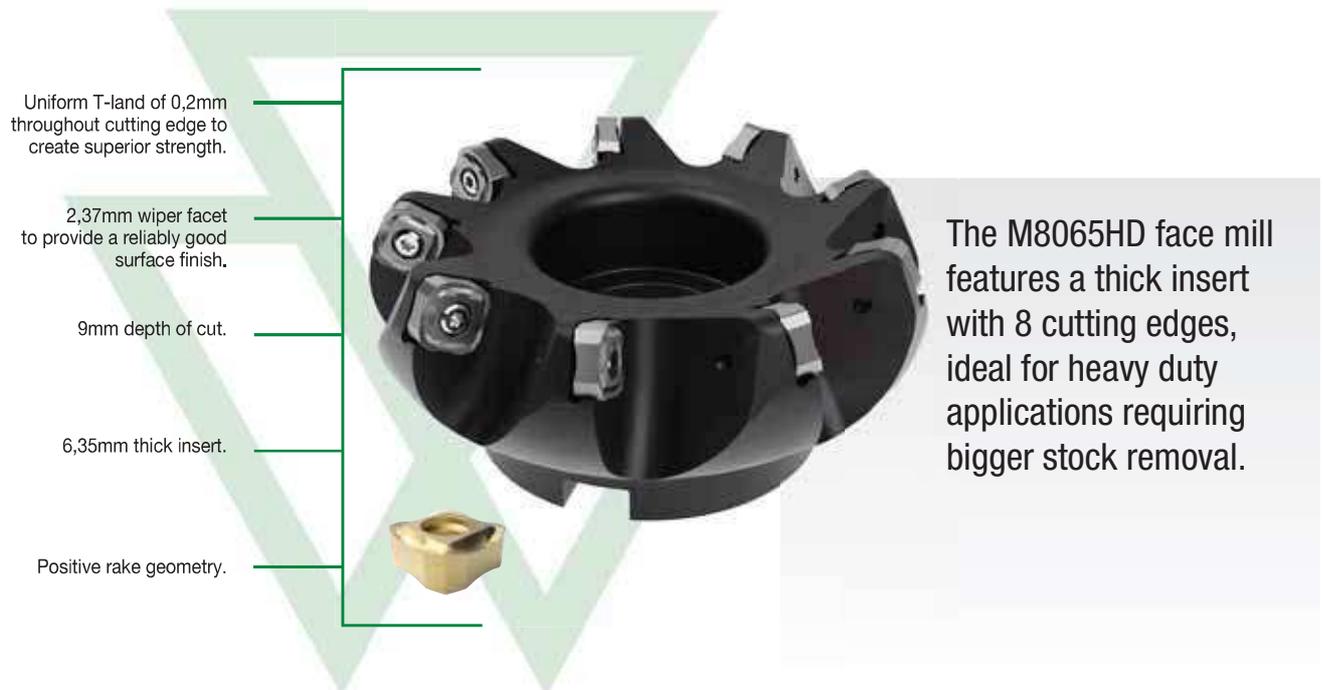




M8065HD

M8065HD Face Mill

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



-MM



WK15CM

K

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

WP35CM

P K

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

WU20PM

P M K N S H

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

DIVE INTO THE DOC WITH M8065HD

PRODUCT

SERIES

M8065HD

DIAMETER RANGE

50–315mm

SHANK TYPES

Shell Mills

INDUSTRY



APPLICATIONS



FACE
MILLING



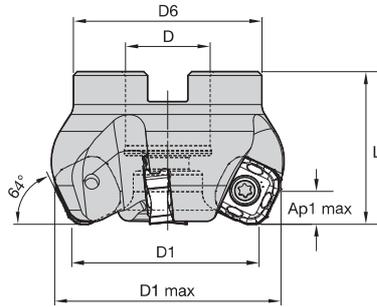
SIDE/SHOULDER MILLING:
EASED CHAMFER

**HEAVY
DUTY**

RELIABLE



M8065HD • 64° • Shell Mills • Metric



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

INDEXABLE MILLING

SOLID END MILLING

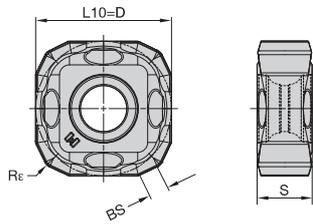
HOLEMAKING

TAPPING

TURNING

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M8065HD • SNMX-MM • Heavy-Duty Face Milling



- first choice
- alternate choice

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

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M8065HD • Insert Selection Guide

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

M8065HD • Recommended Starting Speeds [m/min]

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

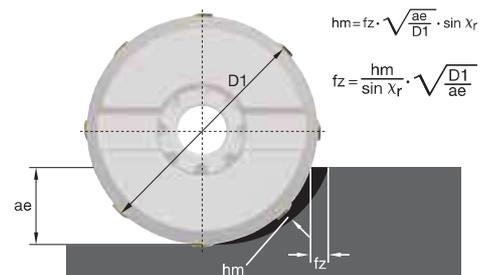
NOTE: FIRST choice starting speeds are in **bold type**.
As the average chip thickness increases, the speed should be decreased.

M8065HD • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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





M8090 Series

M8090, M8090-F Face Mills

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

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

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

Callouts for M8090:

- Fine pitch.
- Insert with eight cutting edges.
- 89-degree approach angle to machine close to the fixture.
- Clamping wedge with double thread screw.
- Rigid 'monoblock' cutter body design.

Callouts for M8090-F:

- Fine pitch cutter with fixed pocket for semi-finisher inserts and adjustable pockets for wiper inserts.
- Inserts with eight cutting edges, wiper inserts with four cutting edges.
- Axial adjustable wiper pocket seats to set up axial run-out within 0,005mm.
- Precision ground inserts and wiper.

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



SNEN Insert



Ceramic insert with eight effective cutting edges



-MM Insert



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



M8090-F Wiper Insert



Wiper inserts with four effective cutting edges.

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

PRODUCT

SERIES
M8090,
M8090-F

DIAMETER RANGE

M8090:
63–250mm

M8090F:
80–250mm

SHANK TYPES

Shell Mills

INDUSTRY



APPLICATIONS



FACE
MILLING

CAST IRON MILLING

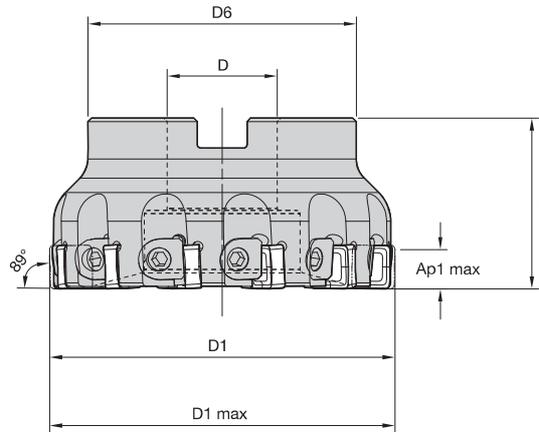
Versatile, productive face mill for
cast iron and ductile iron.

HIGH-FEED

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



M8090 • 89° • Shell Mills • Metric



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

INDEXABLE MILLING

SOLID END MILLING

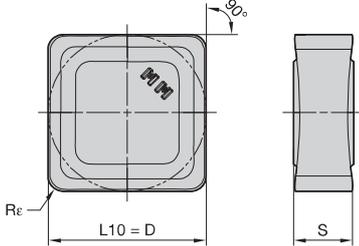
HOLEMAKING

TAPPING

TURNING

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M8090 • Roughing Inserts • SNHF

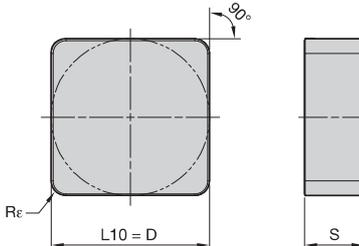



● first choice
○ alternate choice

P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

ISO catalogue number	cutting edges	D	L10	S	Re	hm	WK15CM	WK15PM	WK25YM
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	0,05	○	●	○
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	—	●	○	○

M8090 • Ceramic Inserts • SNEN

● first choice
○ alternate choice

P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M8090 • 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	.S..HN	WK25YM	.S..MM	WK15CM	.S..MM	WK15CM
K3	.S..MM	WK15PM	.S..MM	WK15PM	.S..MM	WK15PM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	-	-	-	-
S3	-	-	-	-	-	-
S4	-	-	-	-	-	-

M8090 • Recommended Starting Speeds [m/min]

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

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

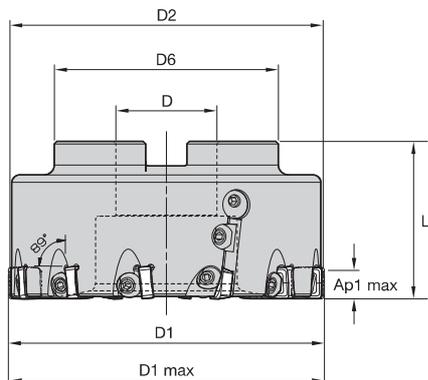
M8090 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

M8090-F • 89° • Shell Mills • Metric



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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

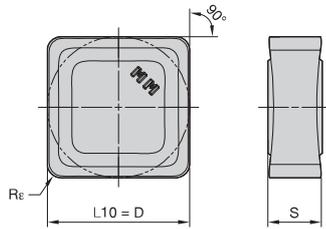
TURNING

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

INDEXABLE MILLING

M8090 • Roughing Inserts • SNHF



- first choice
- alternate choice

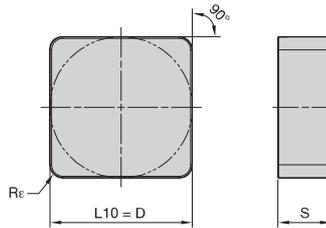
P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

ISO catalogue number	cutting edges	D	L10	S	Re	hm	WK15CM	WK15PM	WK25YM
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	0,05	○	●	○
SNHF120412SNMM	8	12,70	12,70	4,76	1,20	—	●	○	○

SOLID END MILLING

HOLEMAKING

M8090 • Ceramic Inserts • SNEN



- first choice
- alternate choice

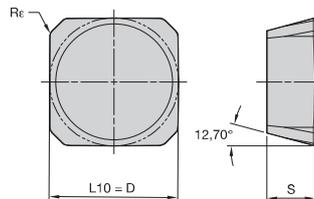
P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

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

TAPPING

TURNING

M8090-F • Wiper Inserts • SDEN



- first choice
- alternate choice

P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

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

M8090 • 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	.S..HN	WK25YM	.S..MM	WK15CM	.S..MM	WK15CM
K3	.S..MM	WK15PM	.S..MM	WK15PM	.S..MM	WK15PM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	-	-	-	-
S3	-	-	-	-	-	-
S4	-	-	-	-	-	-

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

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

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

M8090 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

M4070

M4070 Face Mill

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



-MH



WK15CM

K

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

WP35CM

P M K S

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

RELIABILITY AND SECURITY WITH M4070

PRODUCT

SERIES
M4070

DIAMETER RANGE

125–315mm

SHANK TYPES

Shell Mills

INDUSTRY



APPLICATIONS



FACE
MILLING

RELIABILITY

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

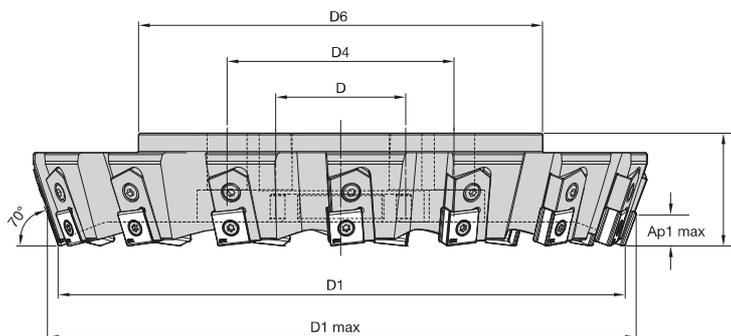
SECURITY

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



TO TACKLE HEAVY-DUTY MACHINING CONDITIONS

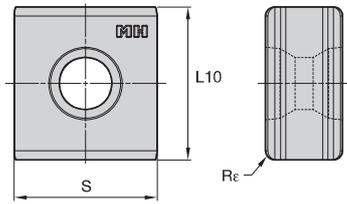
M4070 • 70° • Shell Mills • Metric



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M4070 • LNGX-MH



- first choice
- alternate choice

P	●	○
M	●	○
K	●	○
N	●	○
S	○	○
H	○	○

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M4070 • Insert Selection Guide

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

M4070 • Recommended Starting Speeds [m/min]

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

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

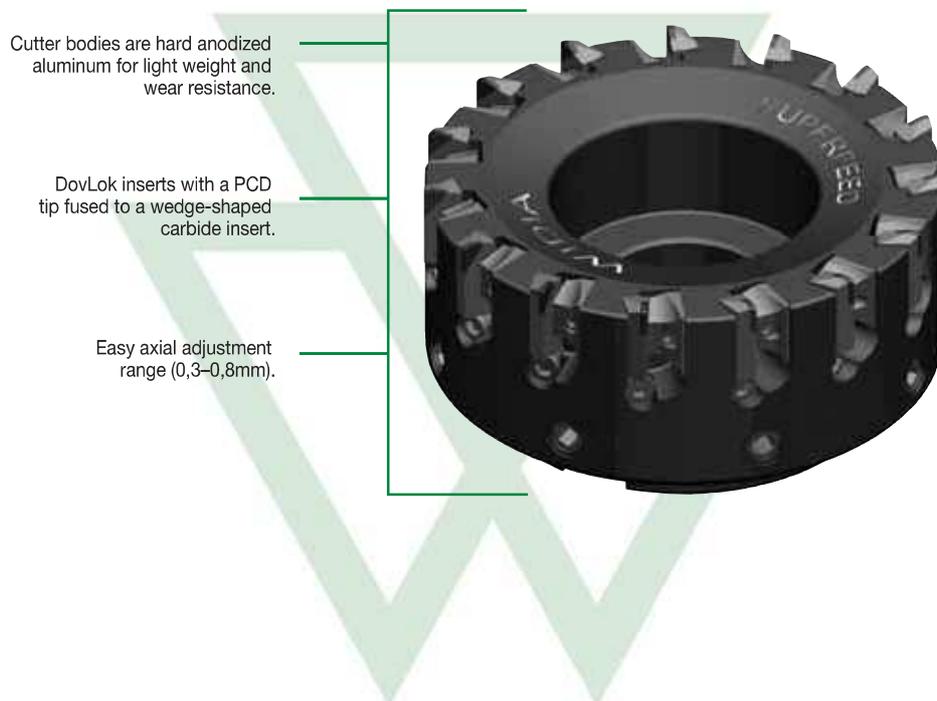
M4070 • Recommended Starting Feeds [mm]

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

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



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



INSERTS OFFERED IN GRADE WDN00U



EDR INSERT
For Shoulder Milling



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



SDR INSERT
For Face Milling



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

NON-FERROUS PCD FACE MILLING

PRODUCT

SERIES

SuperFeed™

DIAMETER RANGE

63–200mm

SHANK TYPES

Shell Mills
Cylindrical End Mills

INDUSTRY



APPLICATIONS



FACE
MILLING



THROUGH
COOLANT:
RADIAL:
INDEXABLE
MILLING



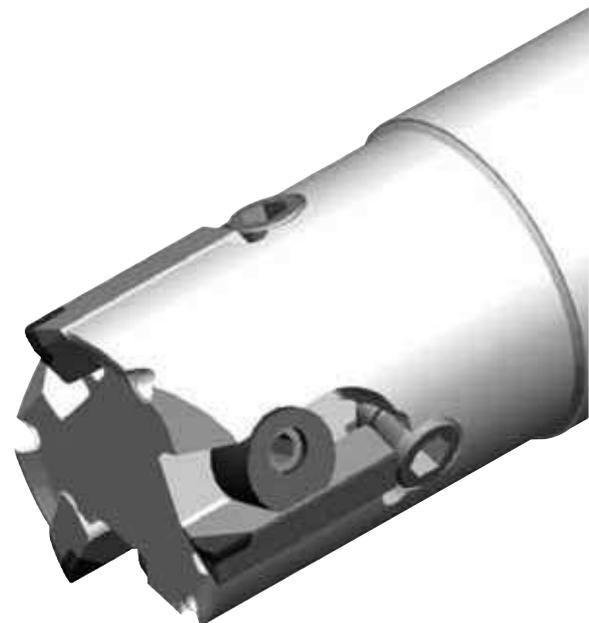
PCD



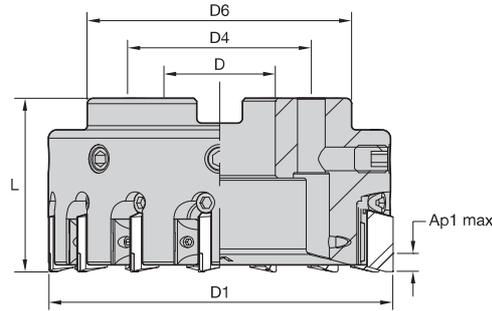
SIDE MILLING/
SHOULDER
MILLING:
SQUARE END

NON-FERROUS

PCD



SuperFeed • Face Mills • Metric



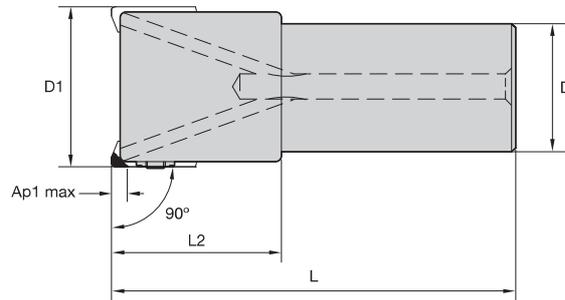
order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	Z ADJ	kg	max RPM
5363208	SF06306RH	63	22	—	60	40	6	6	6	0,45	20000
5363209	SF08008RH	80	27	—	77	50	6	8	8	0,63	20000
5363220	SF10012RH	100	32	—	97	50	6	12	12	1,13	17320
5363221	SF12515RH	125	40	—	122	63	6	15	15	2,30	15500
5363222	SF16018RH	160	40	—	157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

NOTE: Z = Number of cartridges.

Z ADJ = Number of adjustable cartridges.

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

SuperFeed • End Mills • Metric



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

NOTE: Z = Number of cartridges.

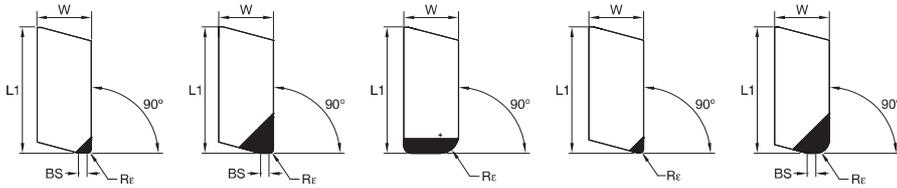
Z ADJ = Number of adjustable cartridges.

NOTE: For setting procedure, see page A85.

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

SuperFeed • PCD Inserts • Face Mills • SDR



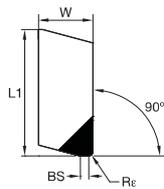
- first choice
- alternate choice

P	■
M	■
K	■
N	●
S	■
H	■

catalogue number	cutting edges	L1	BS	W	R _c	hm	WDN00U
SDR100031E0NW	1	22,23	—	9,53	0,80	0,02	5358450
SDR100031E0W4	1	22,23	1,52	9,53	0,80	0,02	5358407
SDR100031E1W4	1	22,23	1,52	9,53	0,80	0,02	5358408
SDR100093E1W4	1	22,23	1,52	9,53	2,36	0,02	5358409
SDR102	1	22,22	—	9,52	3,17	0,02	5358451

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

SuperFeed • PCD Inserts • End Mills • EDR



- first choice
- alternate choice

P	■
M	■
K	■
N	●
S	■
H	■

catalogue number	cutting edges	L1	BS	W	R _c	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.

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

SuperFeed • Insert Selection Guide

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

SuperFeed • Recommended Starting Speeds [m/min]

Material Group		WDN00U	
P	1	-	-
	2	-	-
	3	-	-
	4	-	-
	5	-	-
	6	-	-
M	1	-	-
	2	-	-
	3	-	-
K	1	-	-
	2	-	-
	3	-	-
N	1-2	910	1980
	3	460	610
S	1	-	-
	2	-	-
	3	-	-
	4	-	-
H	1	-	-

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

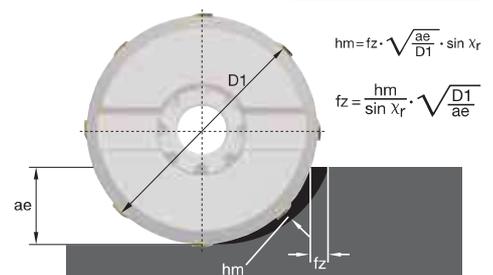
SuperFeed • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

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



Insert Setting and Fine Adjustment Procedure

▼ General

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

▼ Face Mills

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

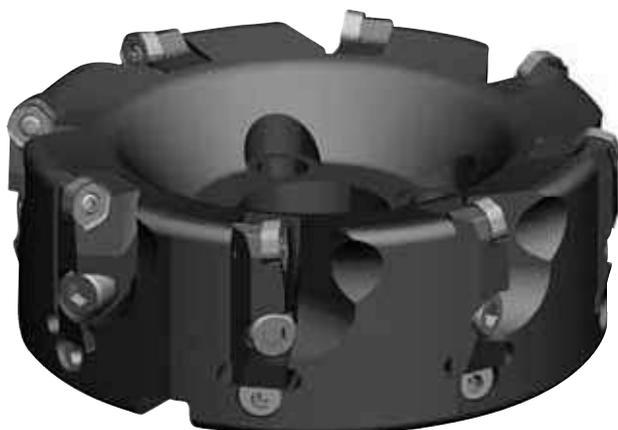
▼ End Mills

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

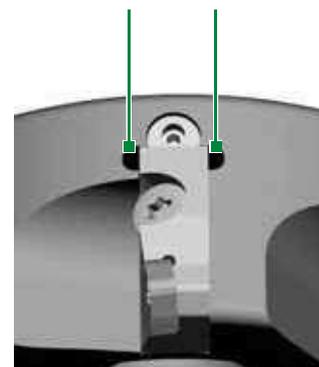
M4000

Cartridge Milling System

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



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



ROUGHING AND FINISHING

PRODUCT

SERIES
M4000

DIAMETER RANGE

125–315mm

SHANK TYPES

Face Mills

INDUSTRY



APPLICATIONS



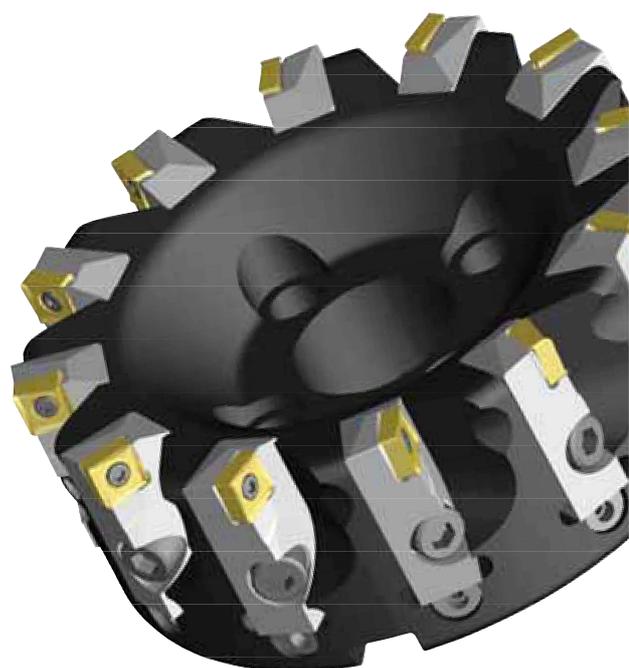
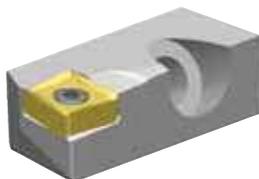
FACE
MILLING



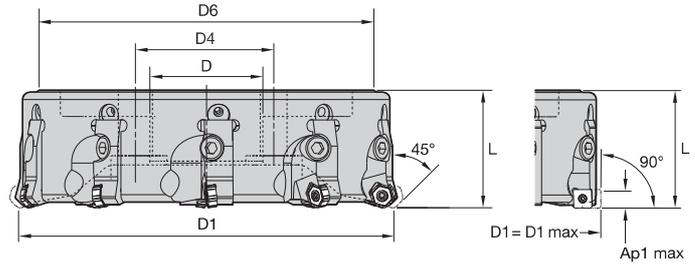
SIDE MILLING/
SHOULDER
MILLING:
SQUARE END

VSM890-12 CARTRIDGE FOR M4000

M4000CA-SNHX12
Order code: 6602179



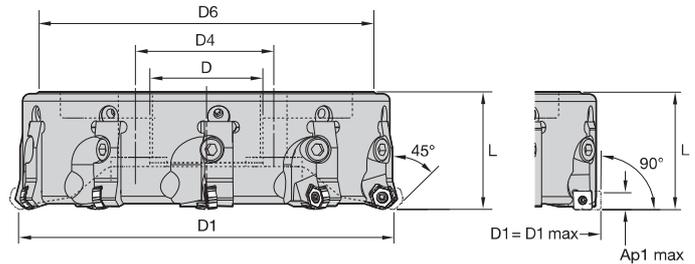
Face Mills • M4000 • Adjustable Cartridge Milling System Cutter Bodies • Metric



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

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

Face Mills • M4000 • Cartridge Milling System • Metric



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.



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

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

45-degree lead angle for most chamfering applications.

Strong tool design for optimum insert support.

Clearance for back chamfer operations.



HEAVY-DUTY CHAMFER MILL FOR OF STEEL AND CAST IRON

PRODUCT

SERIES

M25™

DIAMETER RANGE

25–63mm

SHANK TYPES

Shell Mills
Weldon® End Mills

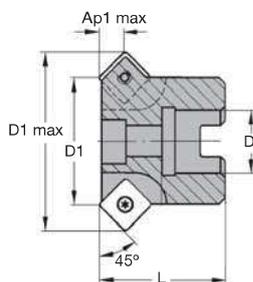
INDUSTRY



APPLICATIONS

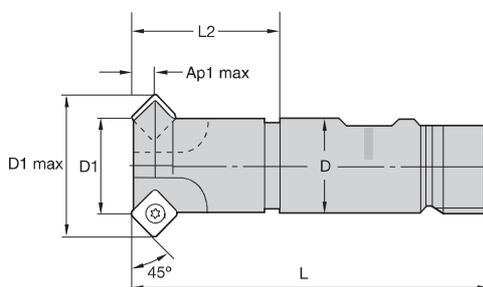


M25 • Shell Mills SP1204 • Metric



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

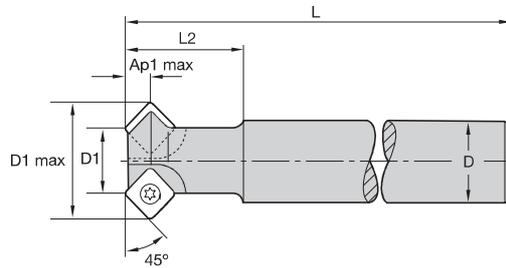
M25 • Weldon® Shank SD0903 • Metric



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

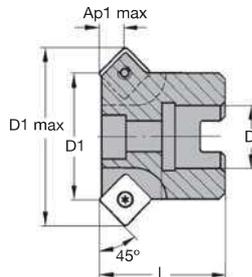
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M25 • Cylindrical Shank SD0903 • Metric



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

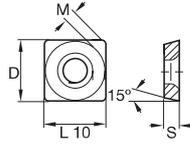
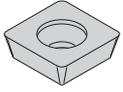
M25 • Shell Mills SD0903 • Metric



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

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

M25 • SDNT

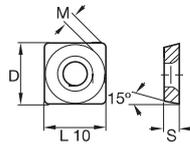
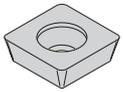


- first choice
- alternate choice

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

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

M25 • SDMW

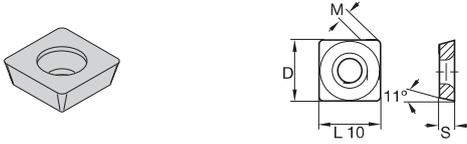


- first choice
- alternate choice

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

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

M25 • SPMW



- first choice
- alternate choice

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

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M25 • SD09 • Insert Selection Guide

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

M25 • SP12 • Insert Selection Guide

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

M25 • Recommended Starting Speeds [m/min]

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

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

M25 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Recommended Starting Feeds [mm]

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

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

INDEXABLE MILLING

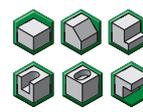
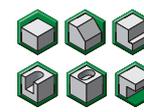
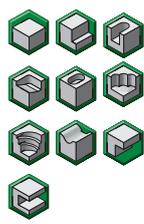
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

Shoulder Milling Portfolio Overview

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

INDEXABLE MILLING

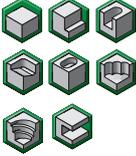
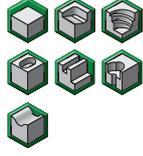
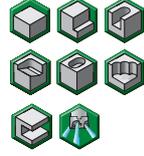
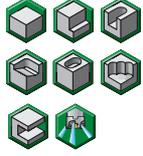
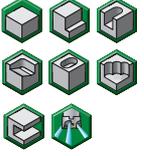
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

Shoulder Milling Portfolio Overview

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

 Good
  Perfect
  Yes
  No
  All-Star Program

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

VSM Single-Sided Series

VSM 11™ Shoulder Mill

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



Body:

- Internal coolant supply.
- Optimized chip gash for improved cutter stability and chip flow.

Insert:

- Embedded wiper facet for great surface floor finish.
- Multiple corner nose radii R0,20mm to R3,20mm available; includes uses for aerospace applications.
- Super-positive rake design for soft cutting action and low machine power consumption.

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

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

GEOMETRIES FOR ALL MATERIAL GROUPS IN SHOULDER MILLING APPLICATIONS

-ALP	-ML	-MM	-MH	-MU
				
N	P M S H	P M K S H	P M K S	P M K N S
Roughing and finishing of aluminum alloys. High precision. Periphery ground.	Light machining and finishing. First choice for stainless steel and titanium. Periphery ground.	Medium machining. First choice for general purpose. Precision pressed to size.	First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.	First choice for low to medium cutting parameters. Precision pressed to size and periphery ground.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

LOW POWER CONSUMPTION, HIGH DEPTH OF CUT

PRODUCT

SERIES

VSM11™

DIAMETER RANGE

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

SHANK TYPES

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

INDUSTRY



APPLICATIONS



SIDE MILLING/
 SHOULDER
 MILLING:
 SQUARE END



SLOTTING:
 SQUARE END



FACE
 MILLING



RAMPING



POCKETING



PLUNGE
 MILLING



HELICAL
 INTERPOLATION/
 POCKET MILLING



3D
 PROFILING



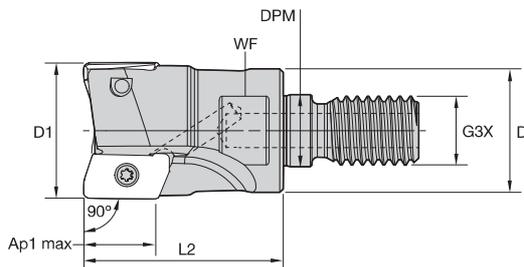
SIDE MILLING/
 SHOULDER
 MILLING:
 BOTTOM
 SHOULDERING



**LOW POWER
 CONSUMPTION**

**SINGLE-SIDED
 INSERTS**

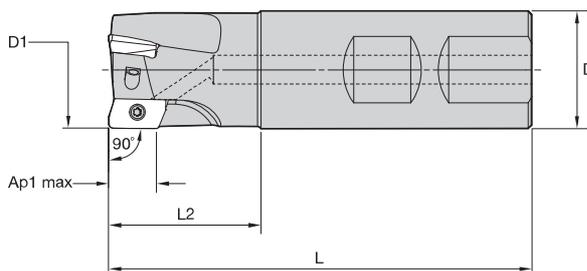
VSM11™ • Screw-On End Mills • Metric



order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5417011	VSM11D016Z02M08XD11	16	13	8,5	M8	25	10	11,5	2	10,0°	41400	Yes	0,02
5417013	VSM11D020Z03M10XD11	20	18	10,5	M10	28	15	11,6	3	7,8°	35100	Yes	0,05
5417015	VSM11D025Z04M12XD11	25	21	12,5	M12	32	17	11,5	4	5,3°	30200	Yes	0,08
5417017	VSM11D032Z04M16XD11	32	29	17,0	M16	40	24	11,4	4	3,6°	25800	Yes	0,18
5417019	VSM11D040Z06M16XD11	40	29	17,0	M16	40	24	11,4	6	2,6°	22600	Yes	0,24

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

VSM11 • Weldon® End Mills • Metric



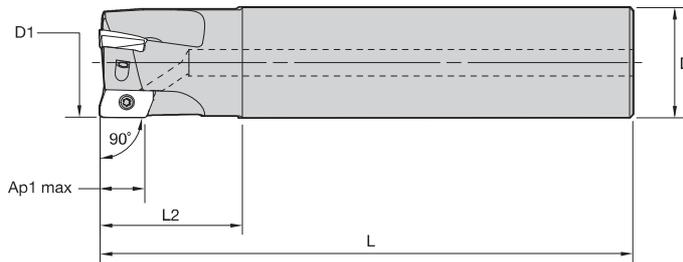
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416454	VSM11D012Z01B16XD11	12	16	70	21	11,7	1	3,7°	53100	Yes	0,08
6616467	VSM11D016Z02B12XD11	16	12	67	21	11,5	2	10,0°	41400	Yes	0,05
5416455	VSM11D016Z02B16XD11	16	16	70	21	11,5	2	10,0°	41400	Yes	0,09
6171449	VSM11D018Z02B16XD11	18	16	70	21	11,6	2	—	39000	Yes	0,09
6616468	VSM11D020Z03B16XD11	20	16	79	30	11,6	3	7,8°	35100	Yes	0,11
5416457	VSM11D020Z02B20XD11	20	20	81	30	11,6	2	7,8°	35100	Yes	0,15
5416458	VSM11D020Z03B20XD11	20	20	81	30	11,6	3	7,8°	35100	Yes	0,16
6171501	VSM11D022Z03B20XD11	22	20	81	30	11,5	3	—	33460	Yes	0,17
6616469	VSM11D025Z03B20XD11	25	20	82	31	11,5	3	5,3°	30200	Yes	0,18
5416459	VSM11D025Z03B25XD11	25	25	88	31	11,5	3	5,3°	30200	Yes	0,27
5416480	VSM11D025Z04B25XD11	25	25	88	31	11,5	4	5,3°	30200	Yes	0,28
5416481	VSM11D030Z04B25XD11	30	25	88	31	11,5	4	3,2°	26900	Yes	0,30
6616470	VSM11D032Z04B25XD11	32	25	96	40	11,4	4	3,6°	25800	Yes	0,35
6616481	VSM11D032Z05B25XD11	32	25	96	39	11,4	5	3,6°	25800	Yes	0,36
5416482	VSM11D032Z04B32XD11	32	32	100	39	11,4	4	3,6°	25800	Yes	0,51
5416483	VSM11D032Z05B32XD11	32	32	100	39	11,4	5	3,6°	25800	Yes	0,52

NOTE: Weldon type not recommended for finishing operations.

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

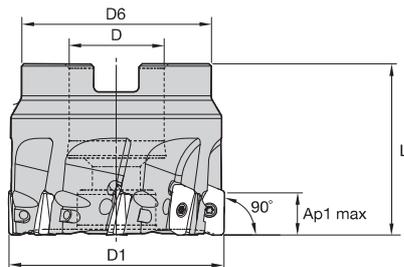
VSM11™ • Cylindrical End Mills • Metric



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

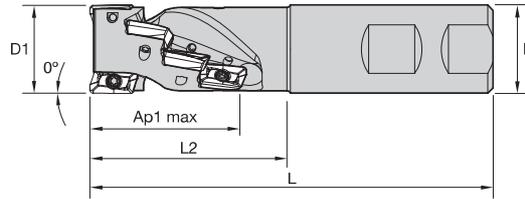
NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.
For tool body modification instructions, see page A114.

VSM11 • Shell Mills • Metric



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

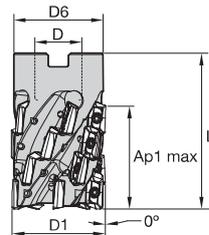
VSM11™ • Helical End Mills with Weldon® Shank • Metric



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

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

VSM11 • Helical Shell Mills • Metric



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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM11™ • Recommended Starting Speeds [m/min]

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

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

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

VSM11 • Recommended Starting Feeds [mm]

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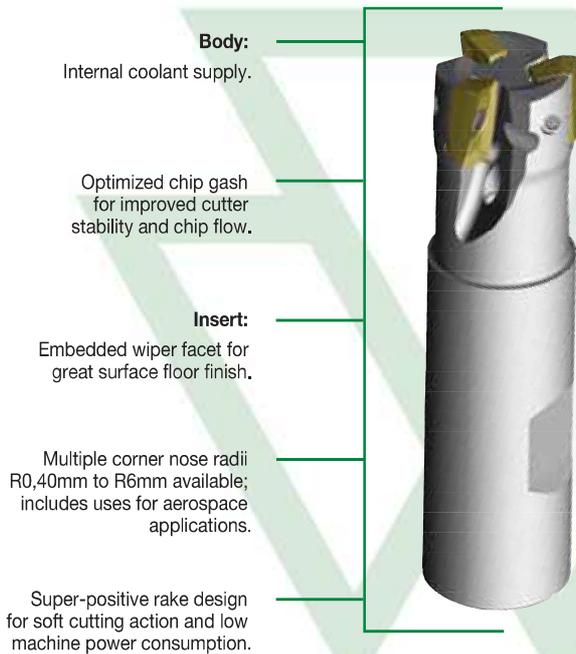
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
.F..PCD	0,12	0,18	0,29	0,08	0,13	0,21	0,06	0,10	0,16	0,06	0,09	0,14	0,05	0,08	0,12	.F..PCD
.F..ALP	0,12	0,22	0,31	0,08	0,16	0,23	0,06	0,12	0,17	0,06	0,10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

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

VSM Single-Sided Series

VSM17™ Shoulder Mill

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



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

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

GEOMETRIES FOR ALL MATERIAL GROUPS IN SHOULDER MILLING APPLICATIONS

-ALP	-ML	-MM	-MH	-MU
				
N	P M S H	P M K S H	P M K S	P M K N S
Roughing and finishing of aluminum alloys. High precision. Periphery ground.	Light machining and finishing. First choice for stainless steel and titanium. Periphery ground.	Medium machining. First choice for general purpose. Precision pressed to size.	First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.	First choice for low to medium cutting parameters. Precision pressed to size and periphery ground.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

LOW POWER CONSUMPTION, HIGH DEPTH OF CUT

PRODUCT

SERIES

VSM17™

DIAMETER RANGE

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

SHANK TYPES

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

INDUSTRY



APPLICATIONS



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



SIDE MILLING/
SHOULDER
MILLING:
BOTTOM
SHOULDERING



SLOTING:
SQUARE END



SLOTING
SIDE



FACE
MILLING



RAMPING
BLANK



HELICAL
INTERPOLATION/
POCKET MILLING



3D
PROFILING



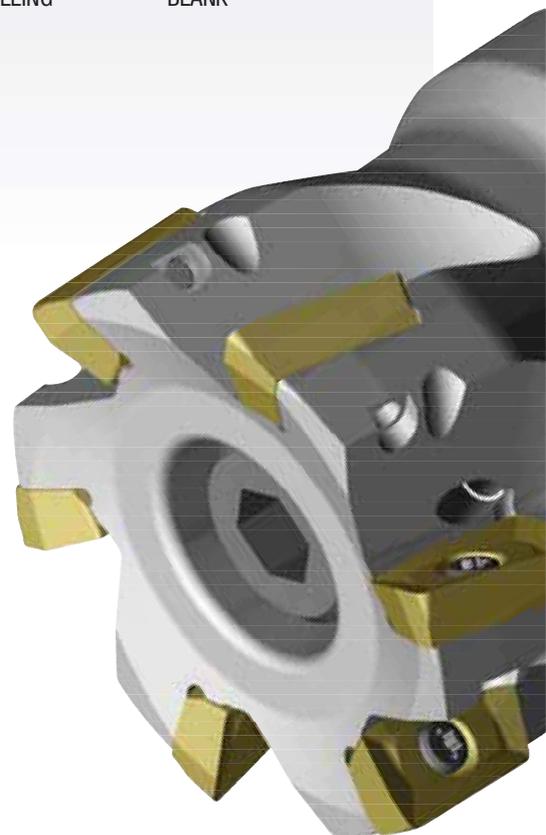
POCKETING



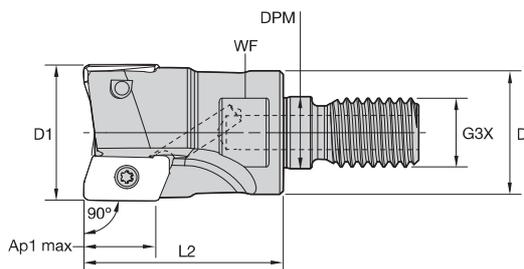
PLUNGE
MILLING

**LOW POWER
CONSUMPTION**

**SINGLE-SIDED
INSERTS**



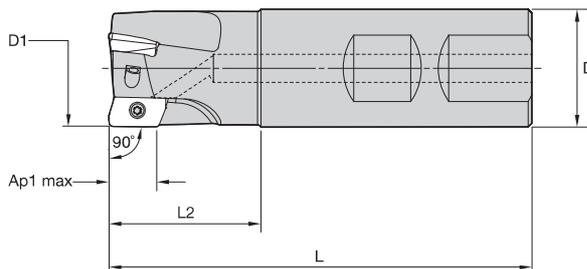
VSM17™ • Screw-On End Mills • Metric



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

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

VSM17 • Weldon® End Mills • Metric

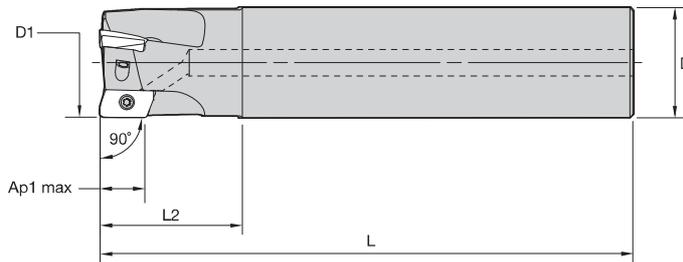


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988102	VSM17D025Z02B25XD17	25	25	90	33	16,4	2	8.8°	41800	Yes	0,26
5988103	VSM17D032Z03B32XD17	32	32	100	39	16,3	3	5.7°	34700	Yes	0,48
5988104	VSM17D040Z04B40XD17	40	40	110	39	16,2	4	4.0°	29800	Yes	0,87

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

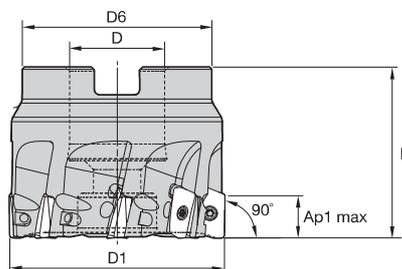
VSM17™ • Cylindrical End Mills • Metric



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

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

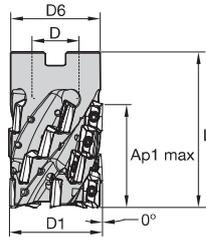
VSM17 • Shell Mills • Metric



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

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

VSM17™ • Helical Shell Mills • Metric

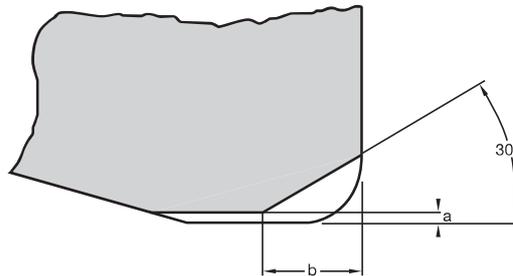


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	max RPM	coolant supply	kg
6740674	VSM17H050Z04S022XD17	50	22	44	85	60,4	16	4	2.8	25000	Yes	0,7
6740675	VSM17H050Z05S022XD17	50	22	44	85	60,4	20	5	2.8	25000	Yes	0,7
6740676	VSM17H063Z04S027XD17	63	27	60	100	75,0	20	4	2.1	22300	Yes	1,5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

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

Application Example

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



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM17™ • Recommended Starting Speeds [m/min]

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

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

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

VSM17 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

VSM Single-Sided Series

VSM22™ Shoulder Mill

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



TWO INSERTS, EACH AVAILABLE IN THREE GRADES

-MH



-MM



WK15CM



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

WP35CM



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

WU20PM



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

RELIABILITY, WHEN IT MATTERS MOST

PRODUCT

SERIES

VSM22™

DIAMETER RANGE

50–125mm

SHANK TYPES

Shell Mills

INDUSTRY



APPLICATIONS



FACE MILLING



PLUNGE MILLING



POCKETING



RAMPING



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



SLOTTING:
SQUARE END



POCKET MILLING



SLOTTING
SIDE

HEAVY DUTY

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

HIGH DEPTH OF CUT

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



INDEXABLE MILLING

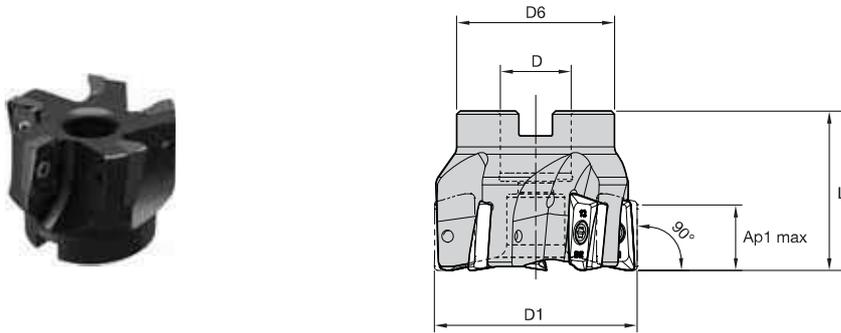
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

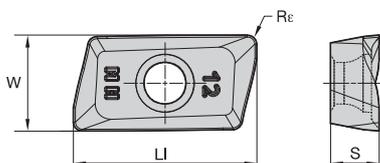
VSM22™ Series • 90° • Shell Mills • Metric



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM22™ • XPHT-MH

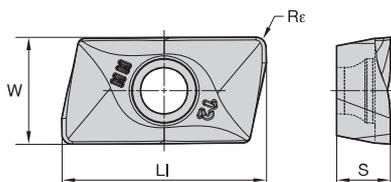


- first choice
- alternate choice

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

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

VSM22 • XPHT-MM



- first choice
- alternate choice

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

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

VSM22™ • Insert Selection Guide

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

VSM22 • Recommended Starting Speeds [m/min]

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

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

VSM22 • Recommended Starting Feeds [mm]

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

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



VSM Series

VSM490-10™, VSM490-15™ Shoulder Mills

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



VSM490-10
Ap1 max = 10mm
Taper 40 spindles



VSM490-15
Ap1 max = 15mm
Taper 50 spindles

FOUR INSERT GEOMETRIES FOR ALL MATERIAL GROUPS IN SHOULDER MILLING APPLICATIONS

★ -ALP



N

For non-ferrous materials.

★ -ML



P M K S H

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

★ -MM



P M K S H

First choice for general purpose in all material groups.

★ -MH



P K

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

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

FOUR-EDGED SHOULDER MILL

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

APPLICATIONS



FACE
MILLING



EASED
CHAMFER



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



SLOTTING:
SQUARE END

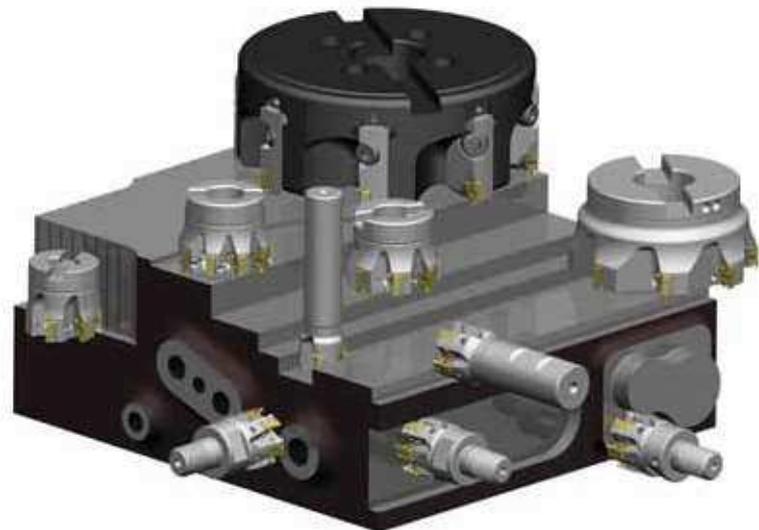


POCKETING

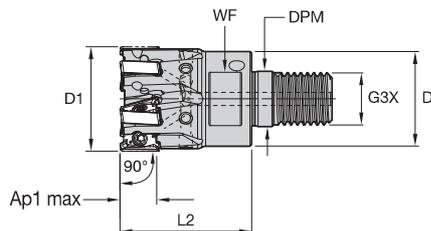


SIDE MILLING/
SHOULDER
MILLING:
BOTTOM
SHOULDERING

INDUSTRY

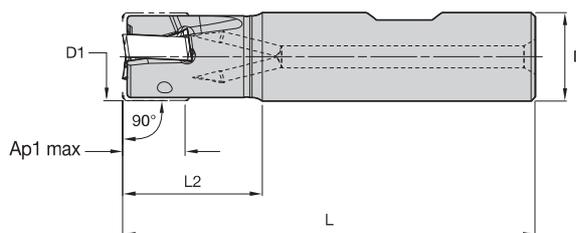


VSM490-10™ • Screw-On End Mills • Metric

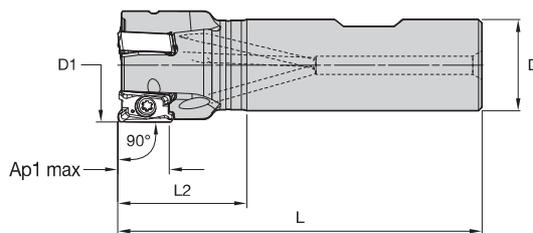


order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
6425553	VSM490D016Z02M08XN10	16	13	8,5	M8	25	10	10,0	2	48000	Yes	0,03
6425554	VSM490D020Z03M10XN10	20	18	10,5	M10	28	15	10,0	3	40200	Yes	0,05
6425555	VSM490D025Z04M12XN10	25	21	12,5	M12	32	17	10,0	4	34300	Yes	0,09
6425556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

VSM490-10 • Weldon® End Mills • Metric



Regular Shank



Reduced Shank

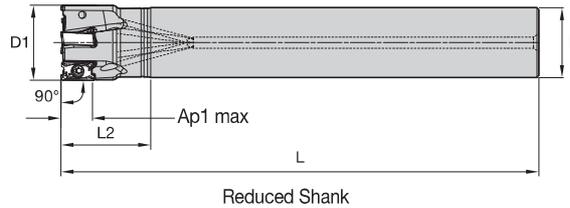
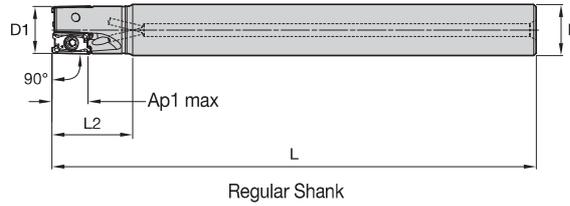
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6425558	VSM490D016Z02B16XN10	16	16	74	25	10,0	2	48000	Yes	0,09
6425559	VSM490D020Z02B20XN10	20	20	79	28	10,0	2	40200	Yes	0,16
6425560	VSM490D020Z03B20XN10	20	20	79	28	10,0	3	40200	Yes	0,16
6425571	VSM490D025Z03B20XN10	25	20	79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

NOTE: Weldon type not recommended for finishing operations.

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

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



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

INDEXABLE MILLING

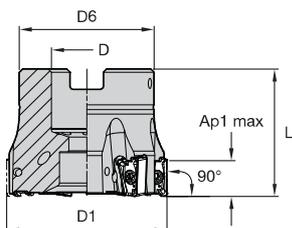
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

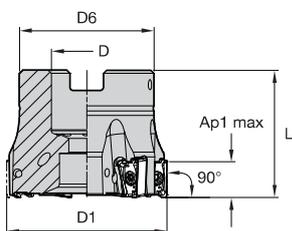
VSM490-10 • Shell Mills • Metric



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

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

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

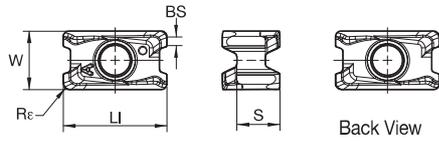


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6425490	VSM490D080Z06S254XN10JIS	80	25,40	50	50	10,0	6	17100	Yes	0,93
6425491	VSM490D080Z08S254XN10JIS	80	25,40	50	50	10,0	8	17100	Yes	0,94
6425492	VSM490D100Z08S3175XN10JIS	100	31,75	60	50	10,0	8	15200	Yes	1,41
6425493	VSM490D125Z10S381XN10JIS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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

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

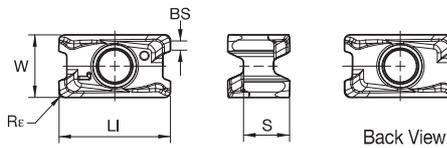


- first choice
- alternate choice

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

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

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

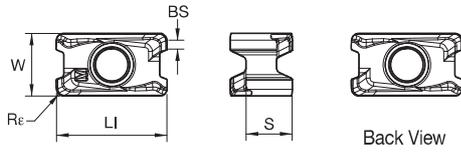


- first choice
- alternate choice

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

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

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

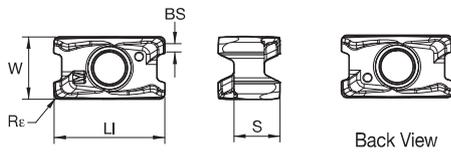


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	R _ε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNGU100404SRMM	4	11,66	4,83	6,60	1,37	0,40	0,08	■	■	■	●	●	●	●	●
XNGU100408SRMM	4	11,66	4,83	6,60	1,00	0,80	0,08	■	■	■	●	●	●	●	●

VSM490-10 • XNGU-MH • Heavy Roughing

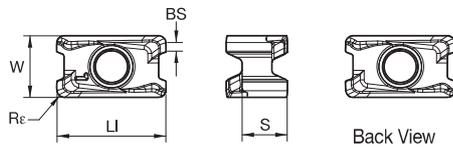


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	R _ε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNGU100408SRMH	4	11,66	4,83	6,60	0,90	0,80	0,08	●	■	■	●	●	●	●	●

VSM490-10 • XNPU-ML • Light Machining

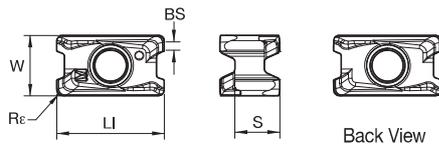


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	R _ε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNPU100408ERML	4	11,60	4,83	6,60	0,90	0,80	0,02	■	●	○	○	○	○	○	○

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



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	R _ε	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
XNPU100408SRMM	4	11,60	4,83	6,60	0,90	0,80	0,08	■	●	○	○	○	○	○	○
XNPU100412SRMM	4	11,61	4,83	6,60	0,50	1,20	0,08	■	○	○	○	○	○	○	○
XNPU100416SRMM	4	11,61	4,83	6,60	0,10	1,60	0,08	■	○	○	○	○	○	○	○

VSM490-10 • Insert Selection Guide

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

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

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

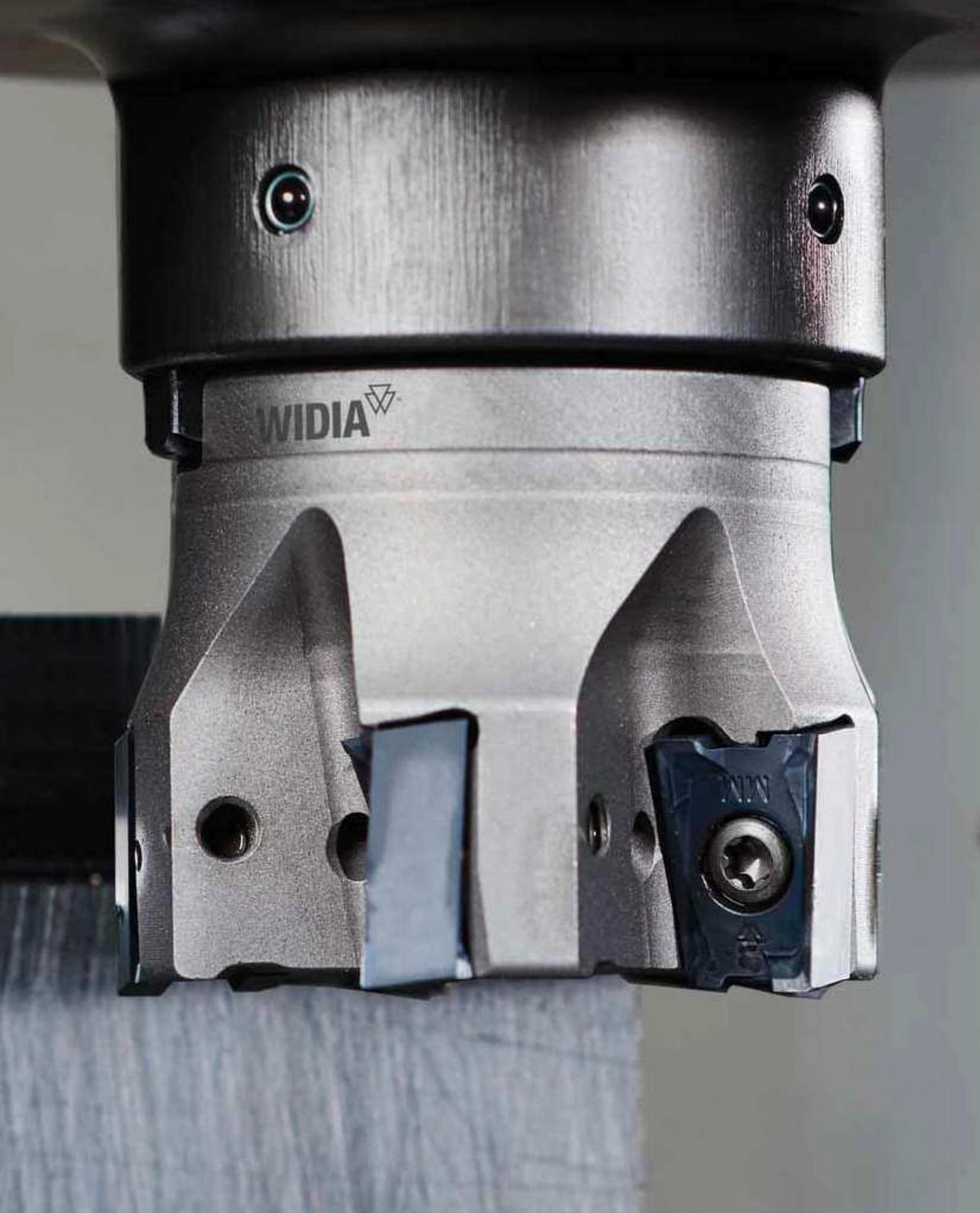
NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.
 *Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.
 *Material groups N and S show recommended starting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

VSM490-10 • Recommended Starting Feeds [mm]

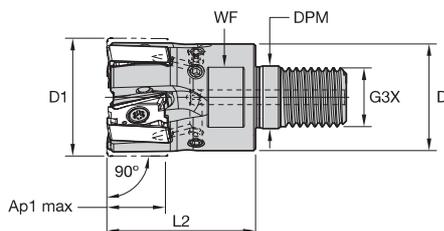
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

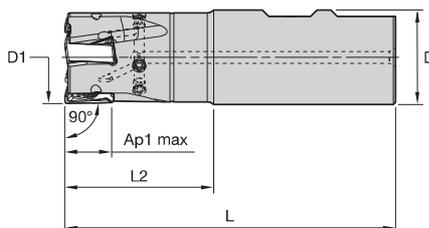


VSM490-15 • Screw-On End Mills • Metric



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

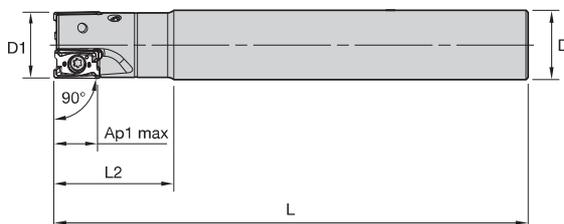
VSM490-15 • Weldon® End Mills • Metric



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

NOTE: Weldon type not recommended for finishing operations.

VSM490-15 • Cylindrical End Mills • Metric

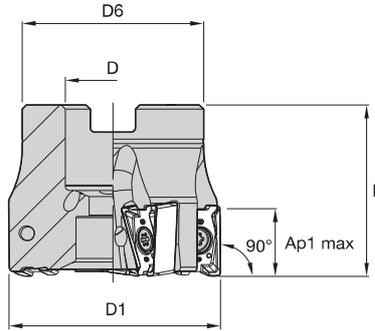


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
5873216	VSM490D025Z02A25XN15L100	25	25	100	43	15,0	2	26700	Yes	0,32
5710287	VSM490D025Z02A25XN15L170	25	25	170	43	15,0	2	26700	Yes	0,59
5873217	VSM490D032Z03A32XN15L110	32	32	110	49	15,0	3	22000	Yes	0,59
5710288	VSM490D032Z03A32XN15L200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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

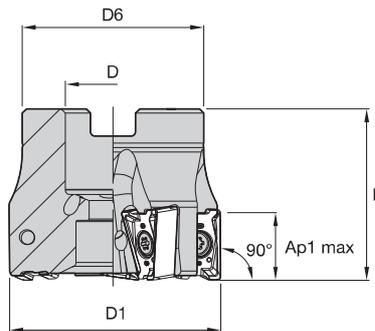
VSM490-15 • Shell Mills • Metric



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

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

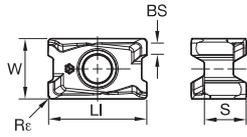
VSM490-15 • Shell Mills • Japanese Industry Standard JIS • Metric



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

INDEXABLE MILLING

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



- first choice
- alternate choice

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

SOLID END MILLING

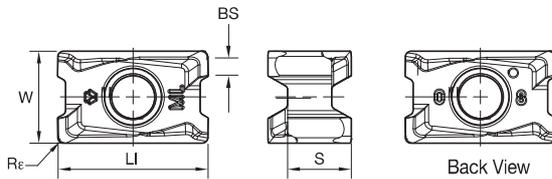
ISO catalogue number	cutting edges	LI	S	W	BS	Re	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNGU15T604ERALP	4	16,20	6,88	10,00	2,20	0,40	0,03	■	■	■	○	○	○	○	○
XNGU15T608ERALP	4	16,20	6,88	10,00	1,80	0,80	0,03	■	■	■	○	○	○	○	○

HOLEMAKING

TAPPING

TURNING

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

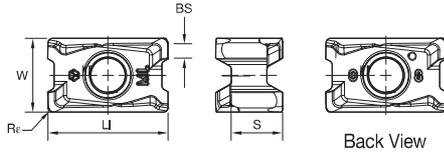


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	Re	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNGU15T604ERML	4	16,20	6,88	10,00	2,20	0,40	0,08	■	■	■	○	○	○	○	○
XNGU15T608ERML	4	16,20	6,88	10,00	1,80	0,80	0,08	■	■	■	○	○	○	○	○

VSM490-15 • XNPU-ML • Light Machining

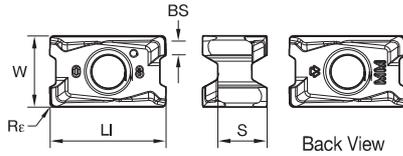


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	Re	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNPU15T608ERML	4	16,10	6,88	10,00	1,90	0,80	0,08	■	■	■	●	○	○	○	○

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



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	Re	hm	WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNPU15T608SRMM	4	16,10	6,88	10,00	1,90	0,80	0,10	■	■	■	●	○	○	○	○
XNPU15T612SRMM	4	16,10	6,88	10,00	1,50	1,20	0,10	■	■	■	●	○	○	○	○
XNPU15T616SRMM	4	16,10	6,88	10,00	1,10	1,60	0,10	■	■	■	●	○	○	○	○
XNPU15T620SRMM	4	16,10	6,88	10,00	0,70	2,00	0,10	■	■	■	●	○	○	○	○

VSM490-15 • Insert Selection Guide

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

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

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

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

VSM490-15 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

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



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

-ALP



N

First choice for non-ferrous materials.

-ML



P M S

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

-MM



P M K S H

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

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

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

PRODUCT

SERIES

VSM890

DIAMETER RANGE

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

SHANK TYPES

Weldon® End Mills
Shell Mills

INDUSTRY



APPLICATIONS



FACE MILLING



SIDE/
SHOULDER
MILLING:
SLOTING:
SHOULDER



SLOTING:
TROCHOIDAL
MILLING



PLUNGE
MILLING



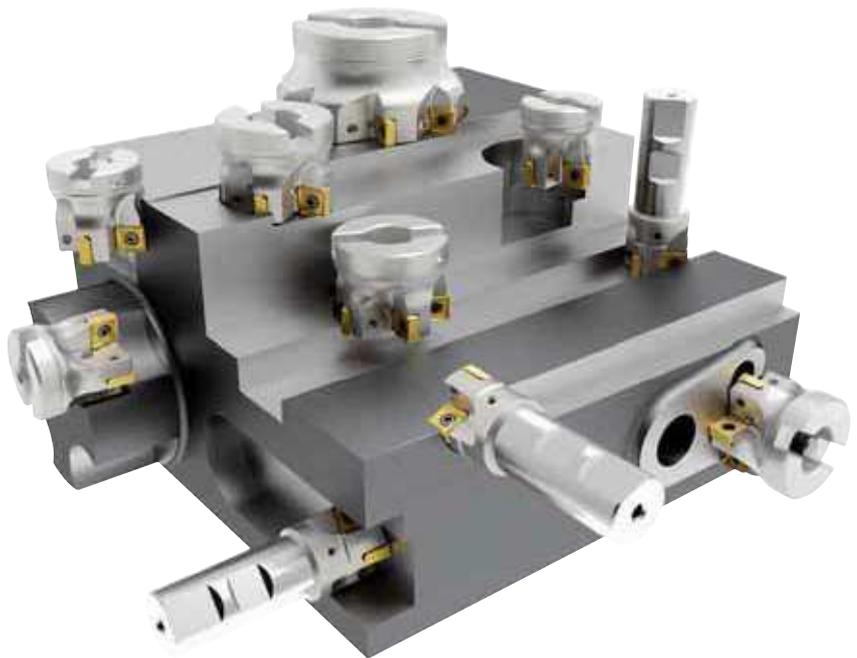
SLOTING:
SQUARE END



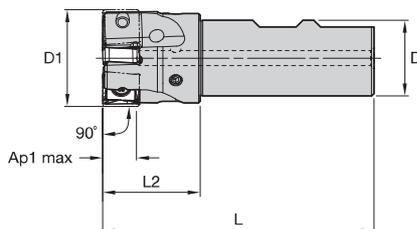
POCKET
MILLING

VERSATILITY

Apply VSM890 in a variety of applications.

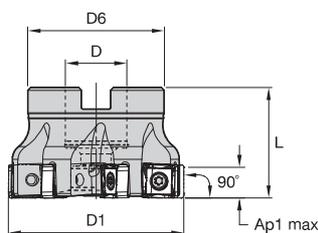


VSM890-12 • Weldon® End Mills • Metric



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

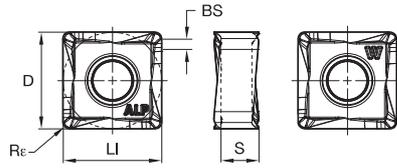
VSM890-12 • Shell Mills • Metric



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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

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

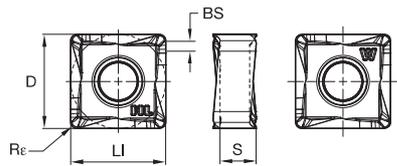


- first choice
- alternate choice

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

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

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

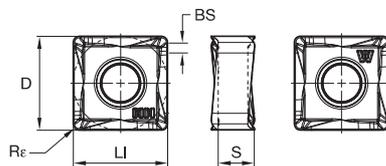


- first choice
- alternate choice

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

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

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



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	D	BS	Rc	WK15CM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU10PM
SNHX120408PNSRMM	8	12,00	4,61	12,00	1,34	0,80	■	■	■	■	■	■	■
SNHX120416PNSRMM	8	12,00	4,58	12,00	1,00	1,60	■	■	■	■	■	■	■

VSM890-12 • Insert Selection Guide

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

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

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

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

VSM890-12 • Recommended Starting Feeds [mm]

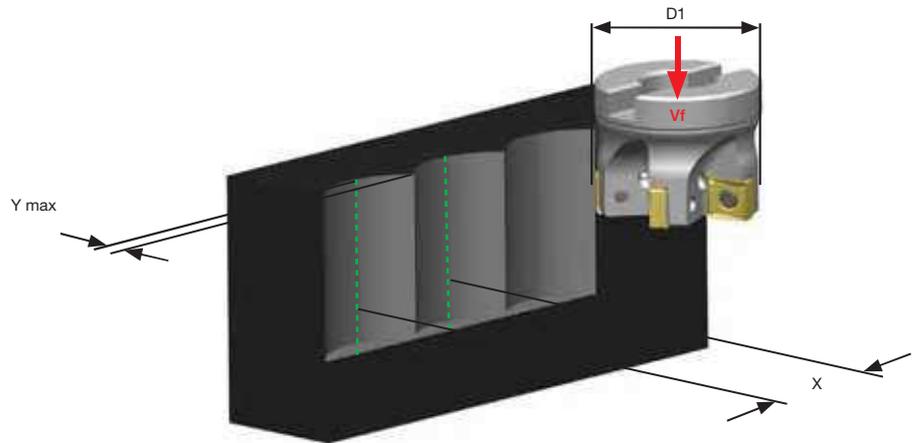
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

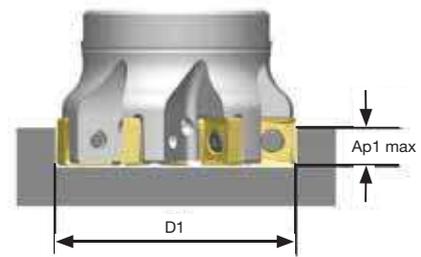
VSM890-12 Z-Axis Plunge Milling

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



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

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



INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M680 Series

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



M680-09

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



M680-16

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



M680+

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

M680 TO M680-16



AL

Additional choice for aluminum and non-ferrous alloy machining.



XP.16..

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



MR

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

M680-09



-XDHT

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



-MM

First choice for general machining in steel and cast iron.

WIDE RANGE OF INSERTS FOR OPTIMAL PERFORMANCE

PRODUCT		INSERTS		
SERIES	DIAMETER RANGE	INSERT TYPE	GRADE	MATERIALS
M680-09	.625–1.25" (16–32mm)	XDHT, MM	WK15PM, WU20PM	P M K N S H
M680-16	1–2" (16–160mm)	ALP, AL, GE, XP.16, MR	THR, THM-U, TN6501, TN6502, TN6510, TN6520, TN6525, TN6540, TTM08, WK15PM, WP35CM, WU20PM, TTI25, THM, WK15CM, WP40PM, WS30PM	P M K N S H
M680+	25–40mm (only available in metric sizes)	ML, MM, MH	THM, TN6510, TN6520, TN6540, WK15CM, WP35CM	P M K N S

APPLICATIONS

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

INDUSTRY



M680-09 • Cylindrical End Mills • XD09 • Metric

INDEXABLE MILLING



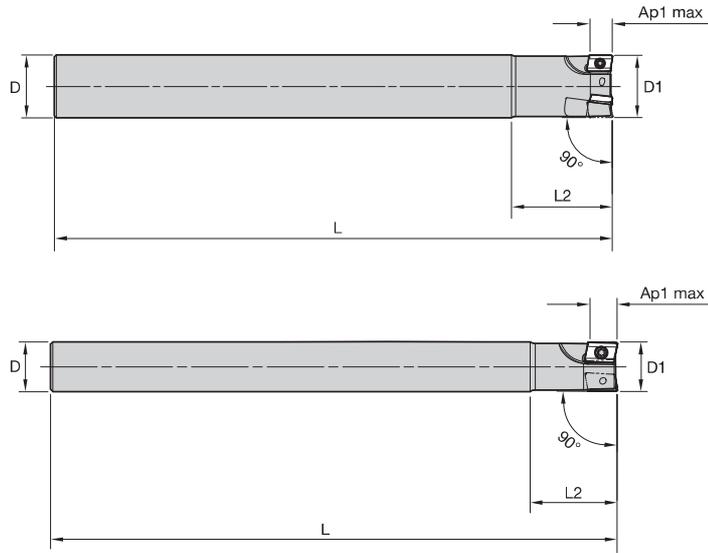
SOLID END MILLING



HOLEMAKING

TAPPING

TURNING



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

NOTE: Please order wrench separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M680-09 • Recommended Starting Feeds [mm]

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

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

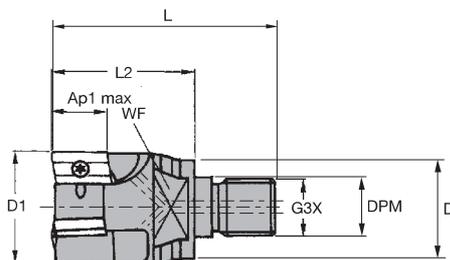
NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

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

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

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

M680-16 • Screw-On End Mills • Metric

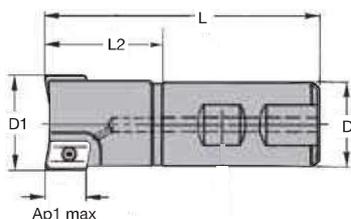


Insert Style XP.T16

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

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

M680-16 • Weldon® End Mills • Metric

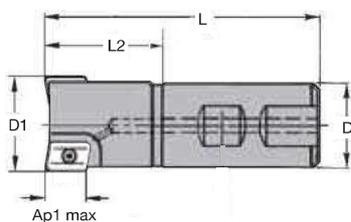


Insert Style XP.T16

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

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

M680-16 • Weldon End Mills • Metric



Insert Style XD.T09

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

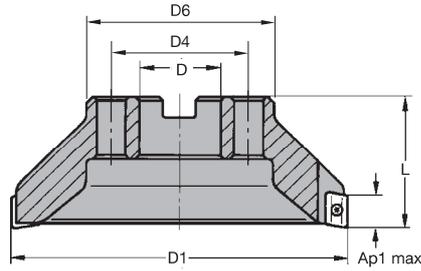
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M680-16 • Shell Mills • Metric



Insert Style XP.T16



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

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M680 • Recommended Starting Speeds [m/min]

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

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

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

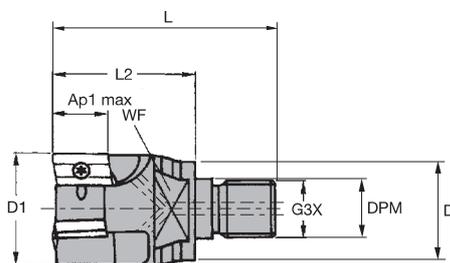
M680 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

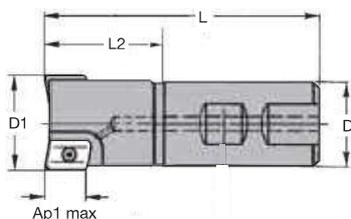
M680+ • Screw-On • Metric



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

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

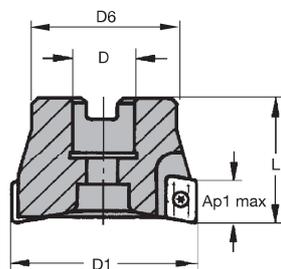
M680+ • Weldon® Shank • Metric



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

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

M680+ • Shell Mills • Metric



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

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M680+ • Insert Selection Guide

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

M680+ • Recommended Starting Speeds [m/min]

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

M680+ • Recommended Starting Speeds [m/min]

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

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

M680+ • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

M690 Series

M690 IC12, M690 IC15 Shoulder Mills

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



iC12 AND iC15 INSERTS OFFERED IN FOUR GEOMETRIES



-ALP



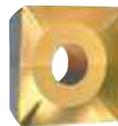
Recommended as a first choice for machining non-ferrous and aluminum materials.



-ML



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



-MM



Steel, cast iron with secondary uses on stainless and titanium.
Recommended as a first choice for general machining of all materials.



-MH



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

ECONOMICAL SHOULDER MILLING

PRODUCT

SERIES
M690

DIAMETER RANGE

125–315mm

SHANK TYPES

Shell Mills
Weldon® End Mills

INDUSTRY



APPLICATIONS



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



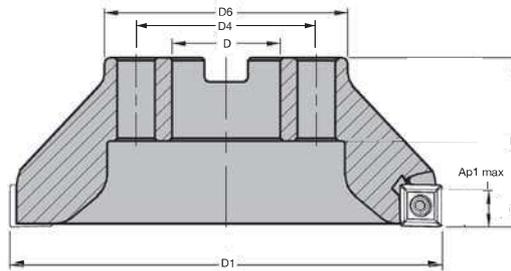
FACE
MILLING



SLOTING:
SQUARE END



M690 • Shell Mills SD1204.. • Metric

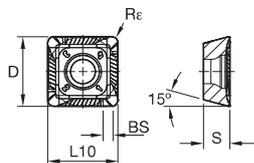


order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003556	12396953800	50	22	—	47	40	10,0	4	22400	Yes	0,3
2003557	12396954000	50	22	—	47	40	10,0	5	22400	Yes	0,3
2003573	12396954200	63	22	—	50	40	10,0	5	20000	Yes	0,5
2003574	12396954400	63	22	—	50	40	10,0	6	20000	Yes	0,5
2003580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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M690 • SDMT-ML • SD1204..



- first choice
- alternate choice

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

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

INDEXABLE MILLING

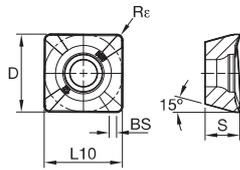
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M690 • SDMX-MM • SD1204..

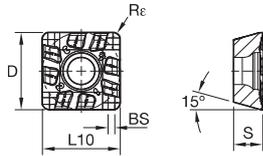


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	R _ε	hm	THM-J	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMX120408RMM	4	13	12,70	4,76	1,93	0,80	0,10	■	■	○	○	○	○	○	○
SDMX120412RMM	4	13	12,70	4,76	1,50	1,20	0,10	■	■	○	○	○	○	○	○
SDMX120416RMM	4	13	12,70	4,76	1,50	1,60	0,10	■	4145063	■	■	■	■	■	■
SDMX120424RMM	4	13	12,70	4,76	0,60	2,40	0,10	■	■	■	4145072	■	6842091	■	■
SDMX120432RMM	4	13	12,70	4,76	—	3,20	0,10	■	■	■	4145094	■	6842092	■	■

M690 • SDMX-MH • SD1204..



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Re	hm	THM-J	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMX120408RMH	4	13	12,70	4,76	1,93	0,80	0,14	■	■	■	■	■	■	■	■
SDMX120412RMH	4	13	12,70	4,76	1,54	1,20	0,14	■	○	○	○	○	○	○	○
SDMX120416RMH	4	13	12,70	4,76	1,50	1,60	0,14	■	■	■	■	■	■	■	■

INDEXABLE MILLING

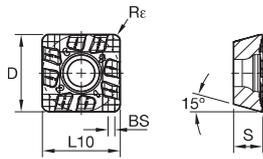
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M690 • SDMT-MH • SD1204..

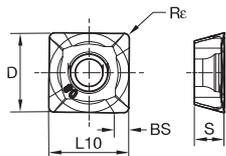


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	R _ε	hm	THM-U	TN6520	TN6525	TN6540	WK15CM	WP35CM	WS30PM	WS40PM
SDMT1204PDRMH	4	13	12,70	4,81	1,10	1,20	0,14	■	■	○	○	○	○	○	○

M690 • SDEX-ALP • SD1204..



- first choice
- alternate choice

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

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

M690 SD1204 • Insert Selection Guide

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

M690 SD1204 • Recommended Starting Speeds [m/min]

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

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

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

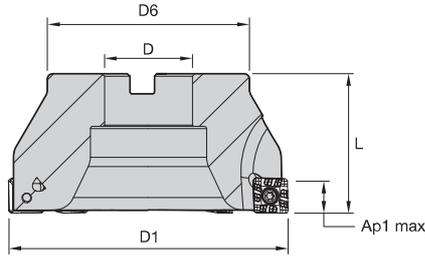
M690 SD1204 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

M690 • Shell Mills SD1506.. • Metric

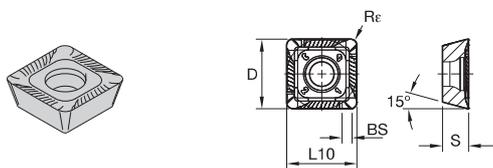


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003555	12396943800	50	22	47	40	12,0	4	18500	Yes	0,3
2003562	12396944200	63	22	50	40	12,0	5	16100	Yes	0,4
2003579	12396944600	80	27	60	50	12,0	6	14000	Yes	0,9
2003595	12396945000	100	32	78	50	12,0	8	12300	No	1,3
2003682	12396945400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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M690 • SDMT-ML • SD1506..

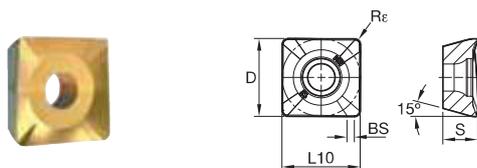


- first choice
- alternate choice

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

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

M690 • SDMX-MM • SD1506..



- first choice
- alternate choice

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

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

INDEXABLE MILLING

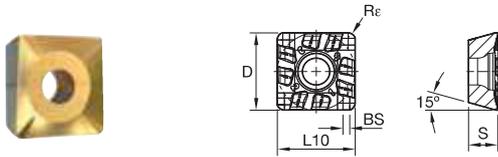
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M690 • SDMX-MM • SD1506..

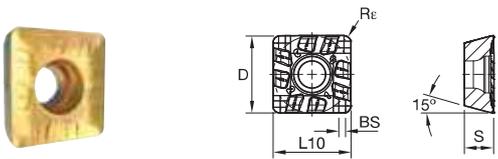


- first choice
- alternate choice

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

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

M690 • SDMT-MH • SD1506..



- first choice
- alternate choice

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

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

M690 SD1506 • Insert Selection Guide

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

M690 SD1506 • Recommended Starting Speeds [m/min]

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

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

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

M690 SD1506 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

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



Flute engineered for maximum chip evacuation.

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

Internal coolant to enable chip evacuation.

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

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

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

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

FR-ALP



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

ER-ALP



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

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

TRUE HSC

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



THIN-WALLED ALUMINUM HIGH-SPEED CUTTING

PRODUCT

SERIES

VHSC

DIAMETER RANGE

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

SHANK TYPES

Cylindrical End Mills
 Monoblocks
 Shell Mills

INDUSTRY



APPLICATIONS



FACE
MILLING



RAMPING
BLANK



HELICAL
MILLING



POCKETING



SIDE/
SHOULDER
MILLING:
SLOTting:
SHOULDER



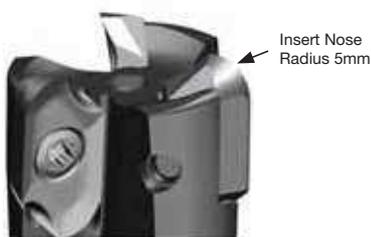
SPIRAL/
CIRCULAR



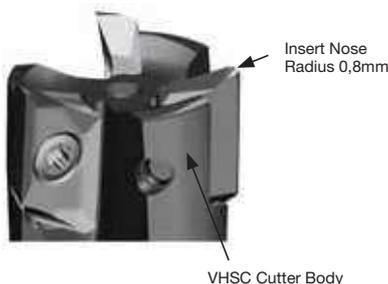
3D PROFILING

USER-FRIENDLY SETUP MAKES A BIG DIFFERENCE

LARGE CORNER RADIUS

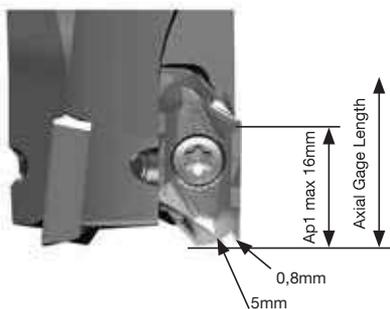


SMALL CORNER RADIUS



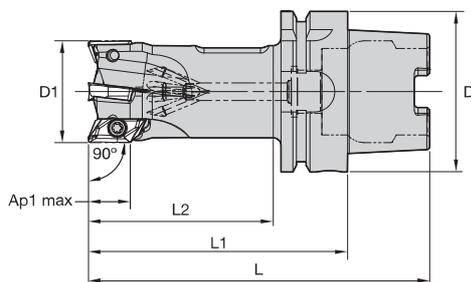
- Unique feature has a great impact on significant cost savings.
- Only one cutter body needed to load inserts with corner nose radii from R0,4mm to R6mm max.
- All other suppliers require modification and rebalance of the cutter body.

INSERT OVERLAY



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

VHSC • Monoblocks • Metric

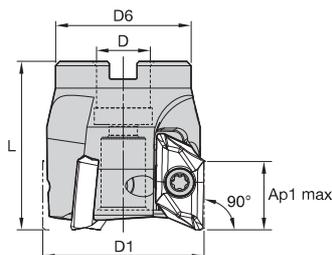


order number	catalogue number	D1	D	L	L1	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425447	VHSC025Z02HSK63XD16	25	63	133	101	75	16	2	14.5°	51000	Yes	0,81
6425449	VHSC032Z03HSK63XD16	32	63	133	101	75	16	3	11.4°	41500	Yes	0,91
6425451	VHSC040Z04HSK63XD16	40	63	133	101	75	16	4	7.8°	35000	Yes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

NOTE: Pre-Balanced G6.3/30000 RPM.

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

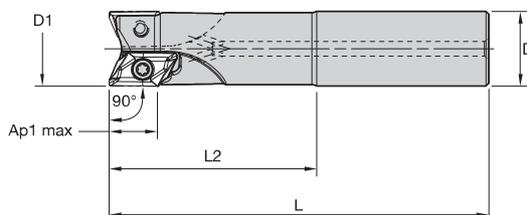
VHSC • Shell Mills • Metric



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

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

VHSC • Cylindrical End Mills • Metric



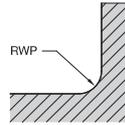
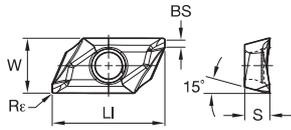
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425258	VHSC025Z02A25XD16	25	25	131	75	16	2	14.7°	50000	Yes	0,39
6425259	VHSC032Z02A32XD16	32	32	135	75	16	2	11.4°	41500	Yes	0,65
6425260	VHSC032Z03A32XD16	32	32	135	75	16	3	11.4°	41500	Yes	0,65

NOTE: Pre-balanced to G6.3/30000 RPM.

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

VHSC • XDET-ALP

- first choice
- alternate choice



P	■
M	■
K	■
N	●
S	■
H	■

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VHSC • Insert Selection Guide

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

VHSC • Recommended Starting Speeds [m/min]

Material Group	WN10HM		
	N	1	2950
2		2950	875
3		1600	480

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

VHSC • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

Recommendations for High Speed Machining at 8000 RPM or above

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



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

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

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

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

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

Balancing:

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

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

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

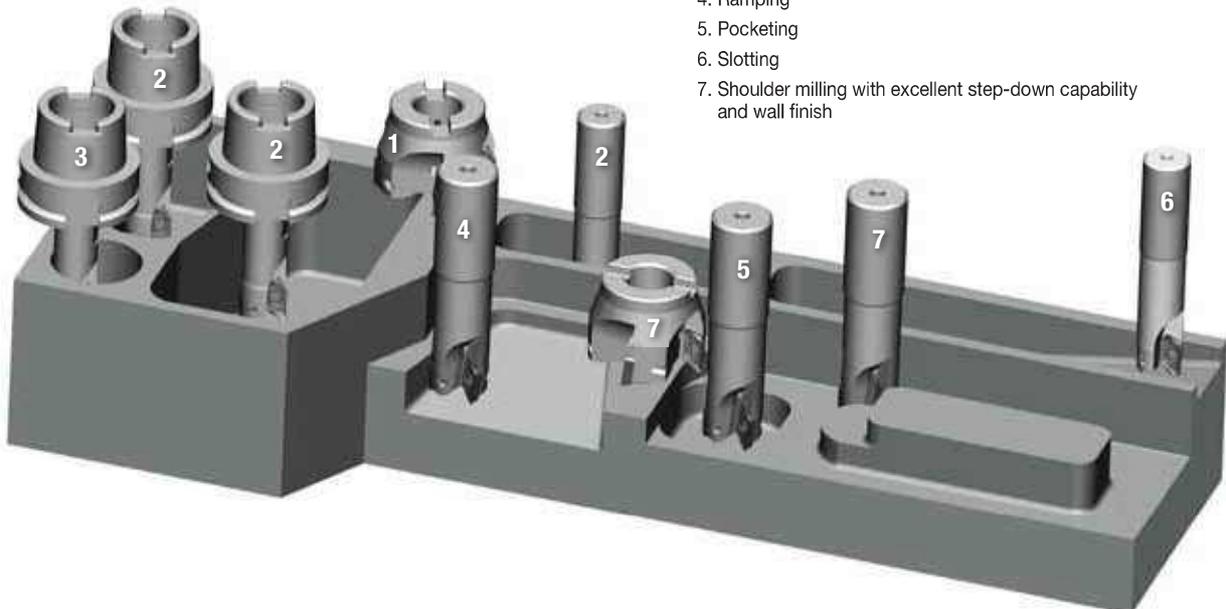
Technical Information

▼ Machinability by Materials • Aluminum

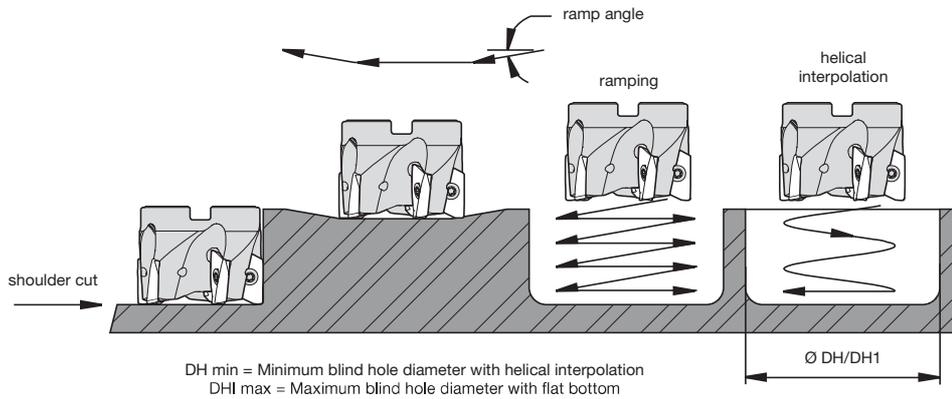
Alloy Group	Alloy Designation	Chemical Composition Limits (WT%)												Typical Temper	Rm (Mpa)	Machinability Chip Formation	Machinability
		Cu	Si	Fe	Mn	Mg	Zn	Cr	Ti	Pb	Bi	Al	Others				
Al	1050	0.05	0.25	0.40	0.50	0.05	0.05	-	-	-	-	99.50min	-	H14	105	D	A
	1100	0.05-0.20	Si+Fe 1.00 max	-	0.05	-	0.10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

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

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



Best Practices



▼ Ramp Angle

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

▼ Helical Min. Hole and Helical Max. Hole

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

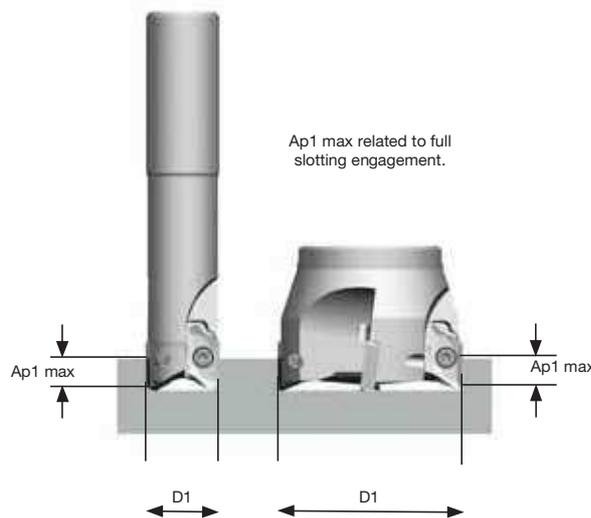
▼ Ap1 max at Helical Interpolation for 360° Tool Path

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

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

▼ Ap1 max at Full Slotting

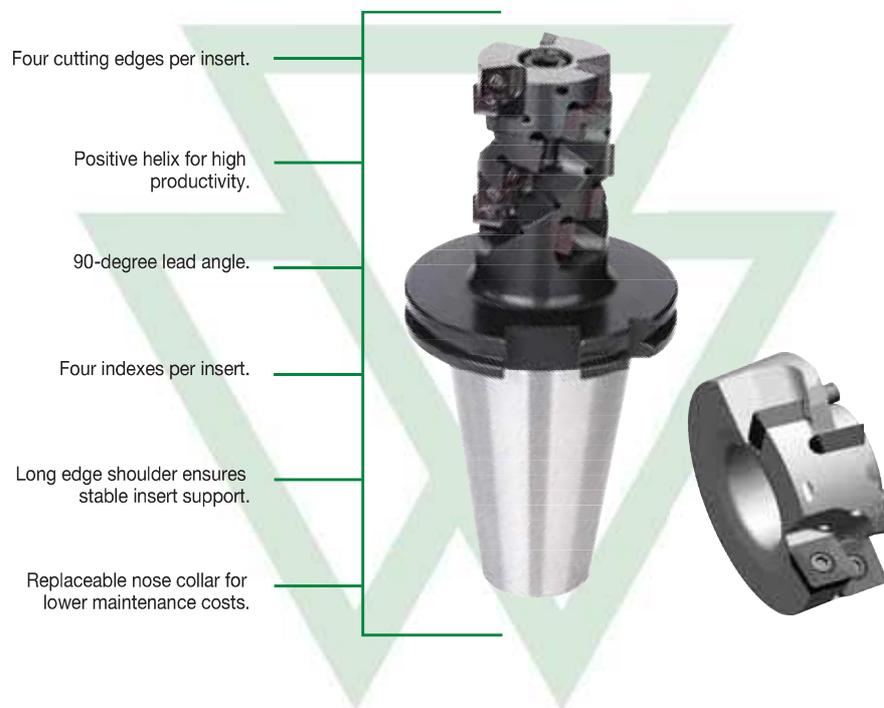
cutting diameter (D1)	Number of inserts Z	Ap1 max
25	2	7,5
32	2	11,0
32	3	6,0
40	3	9,0
50	4	9,0
63	4	11,0
80	5	11,0



M390

M390 Helical Mill

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



INSERTS



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



-MM
First choice for general machining in all materials.



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

FIRST CHOICE FOR HIGH-PRODUCTIVITY HELICAL MILLING

PRODUCT

SERIES

M390

DIAMETER RANGE

50–80mm

SHANK TYPES

Helical End Mills

INDUSTRY



APPLICATIONS



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



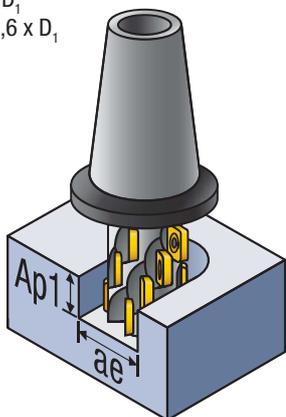
FACE
MILLING



SLOTING:
SQUARE END

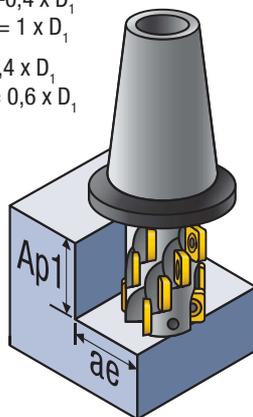
MAXIMUM CUTTING DEPTH (AP1) AND CONTACT WIDTH (AE) RATIOS BASED ON APPLICATION TYPE

SLOT MILLING
 $ae = 1 \times D_1$
 $Ap1 \text{ max} = 0,6 \times D_1$



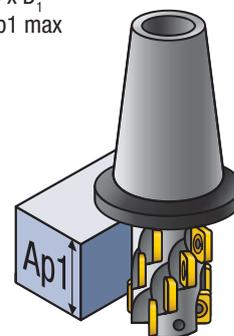
**Not recommended in ISO "H" materials.*

CONTOURING
 $ae = 0,25-0,4 \times D_1$
 $Ap1 \text{ max} = 1 \times D_1$
 $ae = >0,4 \times D_1$
 $Ap1 \text{ max} = 0,6 \times D_1$

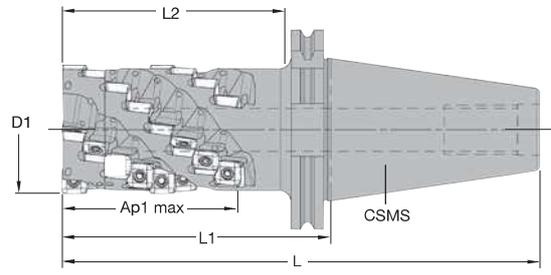


**Not recommended in ISO "H" materials.*

PROFILING
 $ae = <0,25 \times D_1$
 $Ap1 \text{ max} = Ap1 \text{ max}$



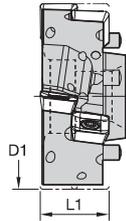
M390 • Integral SD1204.. • Metric



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

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

M390 • End Cap • Metric



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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M390 • Insert Selection Guide

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M390 • Recommended Starting Speeds [m/min]

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

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

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

M390 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

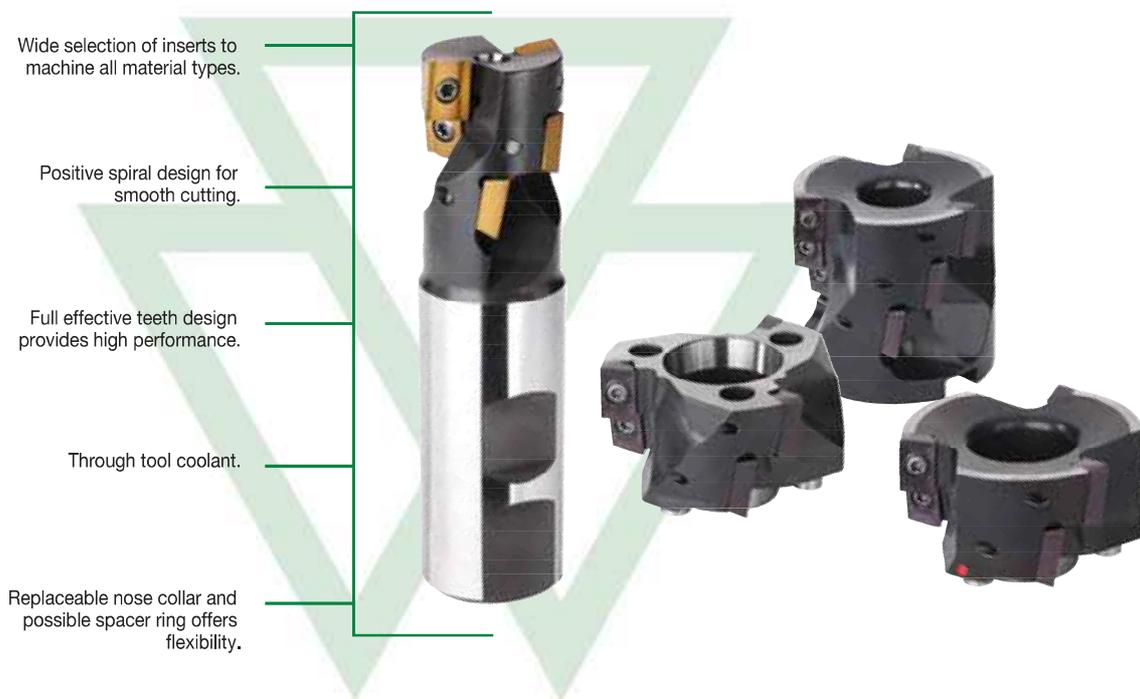
NOTE: Use "Light Machining" value as starting feed rate.



M300 Series

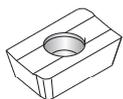
M300, M300+ Helical Mills

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



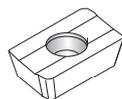
INSERTS

M300+



-ALP

First choice for aluminum and non-ferrous alloy machining.



-AL

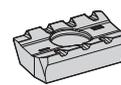
First choice for aluminum and non-ferrous alloy machining.



-GE

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

M300



-MR

First choice for heavy machining and unstable conditions.



-XP.16

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

RELIABLE OPTION FOR GENERAL-PURPOSE HELICAL MILLING

PRODUCT

SERIES

M300

DIAMETER RANGE

50–80mm

SHANK TYPES

Helical End Mills

INDUSTRY



APPLICATIONS



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



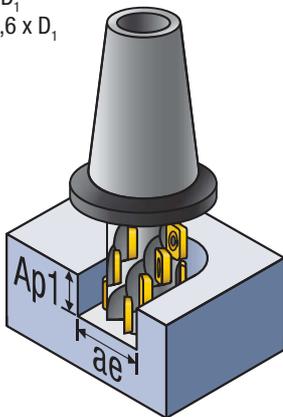
FACE
MILLING



SLOTING:
SQUARE END

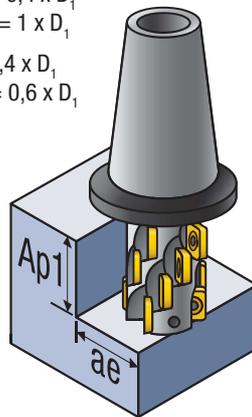
MAXIMUM CUTTING DEPTH (AP1) AND CONTACT WIDTH (AE) RATIOS BASED ON APPLICATION TYPE

SLOT MILLING
 $ae = 1 \times D_1$
 $Ap1 \text{ max} = 0,6 \times D_1$



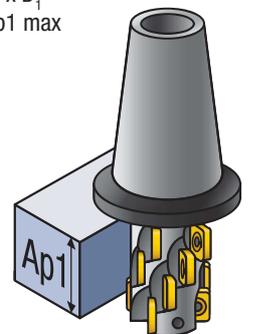
**Not recommended in ISO "H" materials.*

CONTOURING
 $ae = 0,25-0,4 \times D_1$
 $Ap1 \text{ max} = 1 \times D_1$
 $ae = >0,4 \times D_1$
 $Ap1 \text{ max} = 0,6 \times D_1$

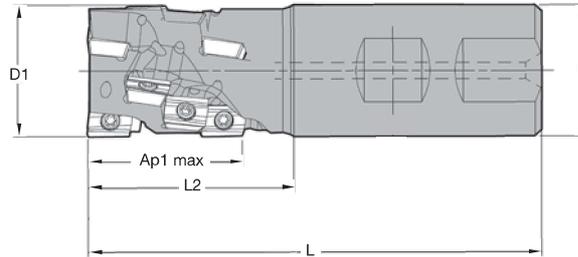


**Not recommended in ISO "H" materials.*

PROFILING
 $ae = <0,25 \times D_1$
 $Ap1 \text{ max} = Ap1 \text{ max}$



M300+ • Weldon® Shank • Metric



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

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M300+ • Recommended Starting Speeds [m/min]

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

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

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

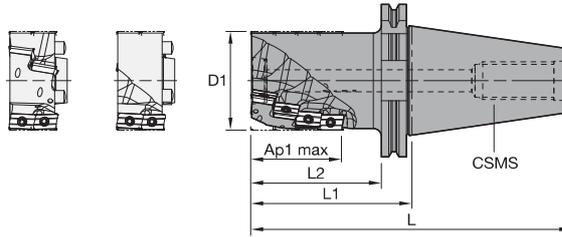
M300+ • Recommended Starting Feeds [mm]

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

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

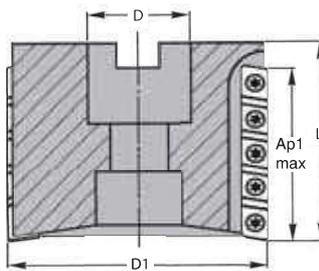
M300 • Integral • Metric



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

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

M300 • Shell Mills • Metric

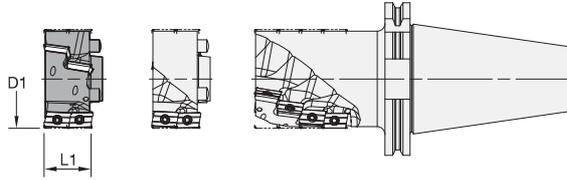


order number	catalogue number	D1	D	L	Ap1 max	Z	Z U	max RPM	coolant supply	kg
2021434	12393080200	50	22	50	28,0	6	3	13090	No	0,4
2021437	12393083200	50	22	65	42,0	12	4	13090	No	0,5
2021435	12393080400	63	27	61	42,0	9	3	11690	No	0,8
2021438	12393083400	63	27	75	56,0	20	5	11690	No	1,0
2021436	12393080600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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
 MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

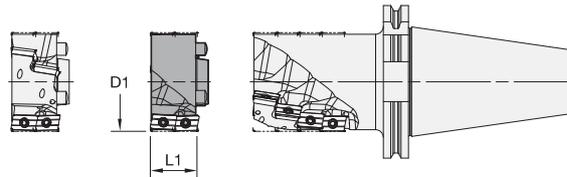
M300 • End Cap • Metric



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

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

M300 • Extension Unit • Metric



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

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M300 • Recommended Starting Speeds [m/min]

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

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

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

M300 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

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

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

Slotting Mills

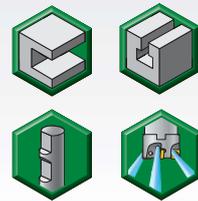
Find the offering of slotting mills at widia.com



M16 T-SLOTTING

Designed for maximum chip evacuation and optimum security, the M16 slot mill series is an excellent choice for T-slot milling of steel and cast iron materials.

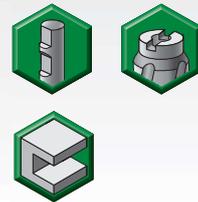
APPLICATIONS



M94 PRECISE SLOTTING AND GROOVING

Designed for the most demanding small width slotting and grooving operations, the M94 slot mill series is an excellent choice for thin slotting and grooving of steel, stainless steel, and cast iron materials.

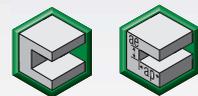
APPLICATIONS



M95 SQUARE STYLE INSERT SLOTTING

The M95 slotting cutter is designed for deeper applications that require the cutting load to be shared from one insert to the other. Use in steel, stainless steel, and cast iron materials.

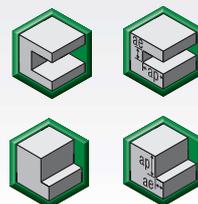
APPLICATIONS



M900 ADJUSTABLE SLOTTING

The M900 slotting cutter is a multipurpose slotting cutter with high-precision capabilities in numerous operations. Use on steel, stainless steel, cast iron, and superalloys.

APPLICATIONS





M16

M16 T-Slotting Mill

Use the M16 T-slot mill to create slots in steel and cast iron materials.



CPNT



Inserts with positive chipbreaker providing low cutting forces.

SMOOTH

The optimized chip gash design provides smooth chip evacuation.

SECURE

The strong and rigid tool body is reliable when machining steel and cast iron.

SMOOTH AND SECURE WITH M16

PRODUCT

SERIES

M16

DIAMETER RANGE

25–50mm

Slot Width Range:
11–21,9mm

SHANK TYPES

Weldon® End Mills

INDUSTRY



APPLICATIONS



SLOTTING:
SIDE



SLOTTING: T



WELDON
SHANK:
WELDON 2
FLAT



THROUGH
COOLANT:
MILLING

T-SLOTTING

STEEL

- If machining a vertical slot, minimize depth; reference Figure 1. If the depth is greater than Figure 1, chip evacuation problems could occur.
- Vibrations could occur when the T-slot cutter diameter increases; use Figure 1 as the starting point. If vibrations are a concern, adopt the Figure 2 solution.

CAST IRON

- Fewer problems with chip evacuation and reduced cutting forces enable deeper vertical slots as shown in Figures 2 and 3.

FIGURE 1

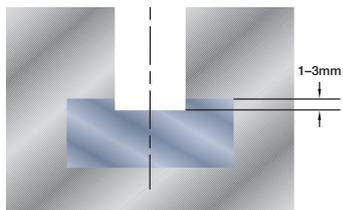


FIGURE 2

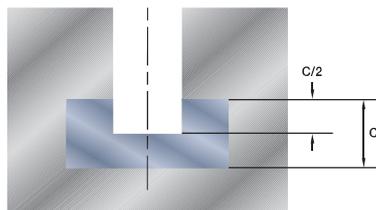
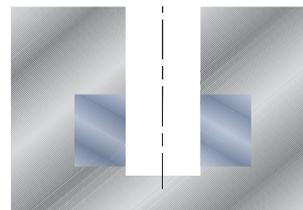
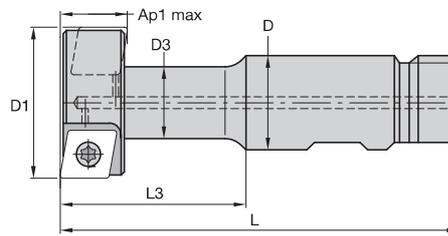


FIGURE 3



NOTE: Air blast is recommended to disperse the chips.

M16 • Weldon® Shank • Metric



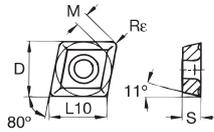
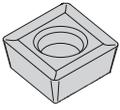
order number	catalogue number	D1	D	D3	L	L3	Ap1 max	Z	Z U	insert 1	coolant supply	kg
2021380	12391602600M	25	16	13	80	32	11,0	4	2	CPNT060204T	Yes	0,1
2021381	12391603000	32	16	15	90	42	13,9	4	2	CPNT080308T	Yes	0,2
2021382	12391603400	40	25	19	105	49	17,9	4	2	CPNT09T308T	Yes	0,4
2021383	12391603800	50	32	25	120	60	21,9	4	2	CPNT120408T	Yes	0,7

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M16 • CPNT • CP0602..

- first choice
- alternate choice

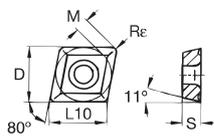
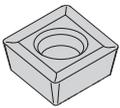


P	●	●	●	●	●
M	●	●	●	●	●
K	○	○	○	○	○
N	●	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT060204T	2	6,35	6,45	1,54	2,38	0,40	0,09	2022086	●	●	●	●
CPNT060204T	2	6,35	6,45	1,54	2,38	0,40	0,03	●	●	5903680	5903676	5578222

M16 • CPNT • CP0803..

- first choice
- alternate choice



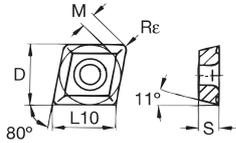
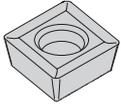
P	●	●	●	●	●
M	●	●	●	●	●
K	○	○	○	○	○
N	●	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT080308T	2	7,94	8,06	1,76	3,18	0,80	0,09	2022089	●	●	●	●
CPNT080308T	2	7,94	8,06	1,76	3,18	0,80	0,04	2022090	●	5903701	5903677	●

Slotting Mills • M16 Series

INDEXABLE MILLING

M16 • CPNT • CP09T3..



- first choice
- alternate choice

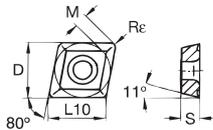
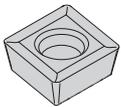
P	■	■	●	●	●
M	■	■	○	○	○
K	■	○	○	○	○
N	■	●	○	○	○
S	■	○	○	○	○
H	■	○	○	○	○

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT09T308T	2	9,52	9,67	2,20	3,97	0,80	0,04	■	2022092	5903702	5903678	■

SOLID END MILLING

HOLEMAKING

M16 • CPNT • CP1204..



- first choice
- alternate choice

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

catalogue number	cutting edges	D	L10	M	S	Rε	hm	THM	TTM08	WK15CM	WP35CM	WP40PM
CPNT120408T	2	12,70	12,90	3,08	4,76	0,80	0,03	■	2022095	5903703	5903679	■

TAPPING

TURNING

M16 • 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	-	-	-	-	-	-

M16 • Recommended Starting Speeds [m/min]

Material Group		THM			TTM08			WK15CM			WP35CM			WP40PM		
		P	0	-	-	-	-	-	-	-	-	-	455	395	370	295
	1	-	-	-	230	200	190	-	-	-	455	395	370	295	260	245
	2	-	-	-	195	170	140	-	-	-	280	255	230	250	215	180
	3	-	-	-	180	150	125	-	-	-	255	230	205	230	195	160
	4	-	-	-	160	130	105	-	-	-	190	175	160	205	170	135
	5	-	-	-	-	-	-	-	-	-	260	230	210	170	155	135
	6	-	-	-	-	-	-	-	-	-	160	135	110	150	115	90
M	1	-	-	-	-	-	-	-	-	-	205	185	155	195	170	155
	2	-	-	-	-	-	-	-	-	-	185	160	140	175	150	125
	3	-	-	-	-	-	-	-	-	-	145	130	115	130	115	90
K	1	120	90	75	-	-	-	420	385	340	295	265	240	-	-	-
	2	125	100	70	-	-	-	335	295	275	235	210	190	-	-	-
	3	130	95	60	-	-	-	280	250	230	195	175	160	-	-	-
N	1	900	600	500	-	-	-	-	-	-	-	-	-	-	-	-
	2	685	465	385	-	-	-	-	-	-	-	-	-	-	-	-
	3	450	280	200	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	-	-	-	-	-	-	40	35	30
	2	-	-	-	-	-	-	-	-	-	-	-	-	40	35	30
	3	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
	4	-	-	-	-	-	-	-	-	-	66	50	33	65	50	35
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
CPNT06	0,12	0,29	0,46	0,09	0,21	0,33	0,07	0,16	0,25	0,06	0,14	0,22	0,05	0,13	0,20	CPNT06
CPNT08	0,12	0,29	0,46	0,09	0,21	0,33	0,07	0,16	0,25	0,06	0,14	0,22	0,05	0,13	0,20	CPNT08
CPNT09	0,12	0,29	0,46	0,08	0,21	0,33	0,06	0,16	0,25	0,06	0,14	0,22	0,05	0,13	0,20	CPNT09
CPNT12	0,12	0,35	0,58	0,08	0,25	0,42	0,06	0,19	0,32	0,06	0,16	0,28	0,05	0,15	0,25	CPNT12

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

VXF™ Series

VXF-07, VXF-09, VXF-12, VXF-16 High-Feed Mills

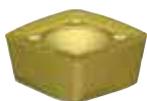
The VXF Series high-feed mills have a nickel-plated body and four durable cutting edges to run at high feeds in deep cavities on primarily steel, stainless steel, titanium, and high-temp alloys.



ALL-IN-ONE INSERT STYLE COMBINED FROM SQUARE AND ROUND DESIGNS TO ACHIEVE POWERFUL HIGH FEEDS

VXF-07

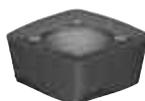
-MM



P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

-MH



P K H

First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs and hardened steel up to 48 HRC.

VXF-09

-MM



P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

-MH

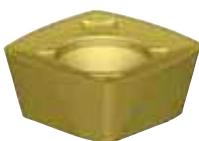


P K H

First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs.

VXF-12

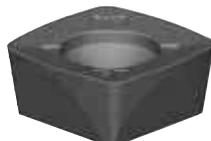
-MM



P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

-MH



P K H

First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs.

VXF-16

-MM



P M S

First choice for soft steel, stainless steel, and high-temp alloys. Best fit for pocketing and profiling operations.

HIGH FEEDS, DEEP CAVITIES

PRODUCT		INSERTS		
SERIES	DIAMETER RANGE	INSERT TYPE	GRADE	MATERIALS
VXF-07	16–50mm	MM, MH	WP40PM, WS40PM, WP25PM, WU10PM	P M K S H
VXF-09	25–63mm	MM, MH	WS40PM, WP25PM, WP40PM	P M S
VXF-12	32–100mm	MM, MH	WS40PM, WP25PM, WP40PM	P M K S H
VXF-16	50–125mm	MM	WS40PM, WP25PM	P M S

APPLICATIONS



FACE MILLING



3D PROFILING



POCKETING



HELICAL MILLING



RAMPING BLANK



SLOTING: TROCHOIDAL MILLING



PLUNGE MILLING

INDUSTRY



TRANSPORTATION



AEROSPACE



ENERGY

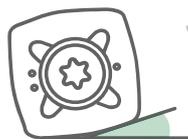


GENERAL ENGINEERING

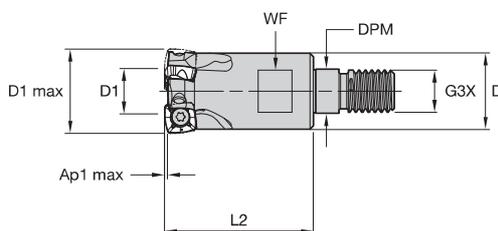
16,5°

LEAD ANGLE

redistributes cutting forces in the spindle z-axis direction.

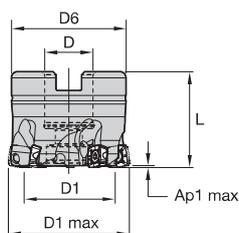


VXF-07 • Screw-On End Mills • Metric



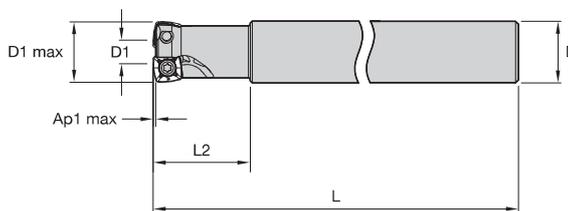
order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597130	VXF016Z02M08XP07	16	7	13	8,5	M8	25	10	0,9	2	5,9°	65000	Yes	0,02
6597151	VXF020Z03M10XP07	20	11	18	10,5	M10	35	15	0,9	3	3,4°	57000	Yes	0,07
6597152	VXF025Z04M12XP07	25	16	21	12,5	M12	35	17	0,9	4	2,2°	49000	Yes	0,09
6597153	VXF032Z05M16XP07	32	23	29	17,0	M16	43	24	0,9	5	1,4°	41500	Yes	0,22

VXF-07 • Shell Mills • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597158	VXF040Z05S16XP07	40	31	16	37	32	0,9	5	1,0°	35000	Yes	0,19
6597159	VXF050Z07S22XP07	50	41	22	42	40	0,9	7	.7°	31300	Yes	0,32

VXF-07 • Cylindrical End Mills • Metric

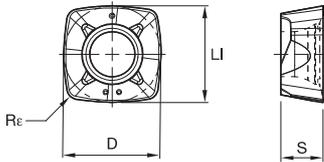


order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597154	VXF016Z02A16XP07L180	16	7	16	180	25	0,9	2	5,9°	65000	Yes	0,24
6597155	VXF018Z02A18XP07L180	18	9	18	180	25	0,9	2	5,4°	61000	Yes	0,31
6597156	VXF020Z03A20XP07L190	20	11	20	190	32	0,9	3	3,4°	57000	Yes	0,41
6597157	VXF025Z04A25XP07L200	25	16	25	200	40	0,9	4	2,2°	49000	Yes	0,69

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-07 • XPPT-MM

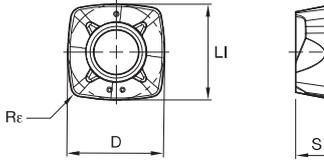
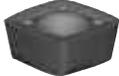


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WP40PM	WS40PM	WU10PM
XPPT070308ERMM	4	7,30	3,17	7,30	0,80	6595619	6595620		

VXF-07 • XPPW-MH



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WP40PM	WS40PM	WU10PM
XPPW070310SRMH	4	7,30	3,17	7,30	1,00	6595770	6595769		

VXF-07 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	XPPT-MM	WP25PM	XPPT-MM	WS40PM	XPPW-MH	WP40PM
P3-P4	XPPT-MM	WP25PM	XPPT-MM	WS40PM	XPPW-MH	WP40PM
P5-P6	XPPT-MM	WP25PM	XPPT-MM	WS40PM	XPPW-MH	WP40PM
M1-M2	XPPT-MM	WS40PM	XPPT-MM	WS40PM	XPPW-MH	WP40PM
M3	XPPT-MM	WS40PM	XPPT-MM	WS40PM	XPPW-MH	WP40PM
K1-K2	XPPW-MH	WU10PM	XPPW-MH	WU10PM	XPPW-MH	WU10PM
K3	XPPW-MH	WU10PM	XPPW-MH	WU10PM	XPPW-MH	WU10PM
S1-S2	XPPT-MM	WP25PM	XPPT-MM	WS40PM	-	-
S3	XPPT-MM	WS40PM	XPPT-MM	WS40PM	-	-
S4	XPPT-MM	WS40PM	XPPT-MM	WS40PM	-	-
H1	XPPW-MH	WU10PM	XPPW-MH	WU10PM	-	-

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

VXF-07 • Recommended Starting Speeds [m/min]

Material Group		WP25PM			WP40PM			WS40PM			WU10PM		
P	1	395	340	325	355	310	295	-	-	-	-	-	
	2	330	290	240	300	260	215	-	-	-	-	-	
	3	305	260	210	275	235	190	-	-	-	-	-	
	4	270	220	180	245	205	160	-	-	-	-	-	
	5	220	205	180	205	185	160	205	175	145	-	-	
	6	200	150	120	180	140	110	180	130	95	-	-	
M	1	245	215	200	235	205	185	250	205	170	-	-	
	2	220	190	155	210	180	150	215	175	145	-	-	
	3	170	145	115	155	140	110	175	130	100	-	-	
K	1	275	245	220	-	-	-	-	-	-	355	320	290
	2	215	190	180	-	-	-	-	-	-	275	245	230
	3	180	160	145	-	-	-	-	-	-	235	210	190
S	1	50	40	30	50	40	35	50	40	30	-	-	-
	2	50	40	30	50	40	35	50	40	30	-	-	-
	3	60	50	30	60	50	35	60	50	30	-	-	-
	4	85	60	40	80	60	40	70	60	35	-	-	-
H	1	145	110	85	-	-	-	-	-	-	190	155	110

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

*Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.

*Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.

VXF-07 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 0,60 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%		10%		20%		30%		40-100%							
.E..MM	0,46	1,32	2,43	0,32	0,89	1,53	0,24	0,65	1,09	0,21	0,56	0,94	0,19	0,52	0,85	.E..MM
.S..MH	0,84	1,84	3,12	0,59	1,21	1,85	0,43	0,87	1,30	0,38	0,75	1,12	0,34	0,69	1,02	.S..MH

At 0,70 Axial Depth of Cut (Ap1)

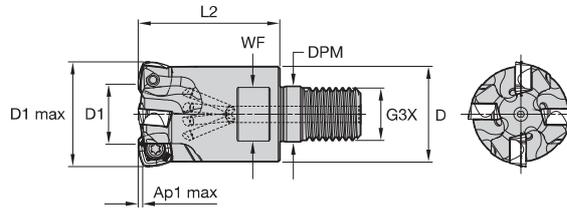
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%		10%		20%		30%		40-100%							
.E..MM	0,42	1,21	2,20	0,30	0,83	1,41	0,22	0,60	1,01	0,19	0,52	0,87	0,18	0,48	0,79	.E..MM
.S..MH	0,78	1,68	2,79	0,55	1,12	1,71	0,40	0,81	1,21	0,35	0,70	1,04	0,32	0,64	0,94	.S..MH

At 0,90 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%		10%		20%		30%		40-100%							
.E..MM	0,37	1,06	1,89	0,27	0,73	1,24	0,20	0,53	0,89	0,17	0,46	0,77	0,16	0,42	0,70	.E..MM
.S..MH	0,68	1,46	2,35	0,48	0,98	1,49	0,36	0,71	1,07	0,31	0,62	0,92	0,28	0,56	0,84	.S..MH

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

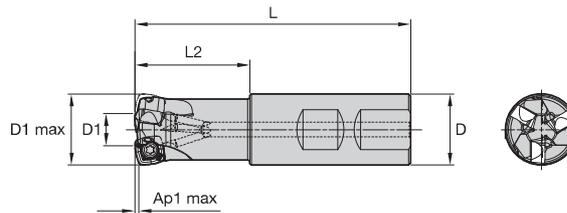
VXF-09 • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597731	VXF025Z03M12XD09	25	11	21	12,5	M12	35	9	1,5	3	2,8°	48500	Yes	0,09
6597732	VXF032Z03M16XD09	32	18	29	17,0	M16	43	10	1,5	3	1,5°	40500	Yes	0,20
6597733	VXF032Z04M16XD09	32	18	29	17,0	M16	43	10	1,5	4	1,5°	40500	Yes	0,20
6597734	VXF035Z04M16XD09	35	21	29	17,0	M16	43	10	1,5	4	1,3°	37500	Yes	0,21
6597735	VXF042Z05M16XD09	42	28	29	17,0	M16	43	10	1,5	5	1,0°	34000	Yes	0,25

NOTE: Please order wrench separately.

VXF-09 • Weldon® End Mills • Metric

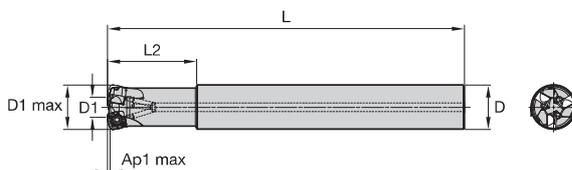


order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597736	VXF025Z03B25XD09	25	11	25	96	40	1,5	3	2,8°	48500	Yes	0,28
6597737	VXF032Z04B25XD09	32	18	25	96	40	1,5	4	1,5°	40500	Yes	0,36

NOTE: Please order wrench separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

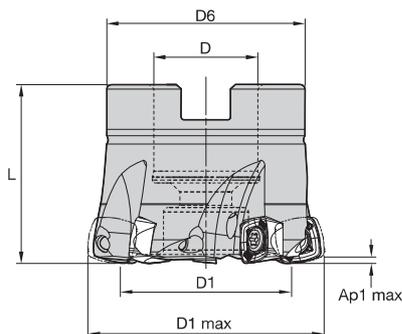
VXF-09 • Cylindrical End Mills • Metric



order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597740	VXF025Z02A25XD09L200	25	11	25	200	50	1,5	2	2.8°	48500	Yes	0,67
6597742	VXF025Z03A25XD09L200	25	11	25	200	50	1,5	3	2.8°	48500	Yes	0,67
6597743	VXF032Z03A25XD09L200	32	18	25	200	40	1,5	3	1.5°	40500	Yes	0,75
6597744	VXF032Z04A25XD09L200	32	18	25	200	40	1,5	4	1.5°	40500	Yes	0,75

NOTE: Please order wrench separately.

VXF-09 • Shell Mills • Metric



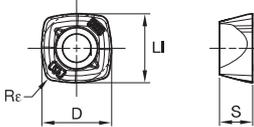
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597746	VXF040Z04S16XD09	40	26	16	37	32	1,5	4	.8°	34500	Yes	0,15
6597747	VXF040Z05S16XD09	40	26	16	37	32	1,5	5	.8°	34500	Yes	0,14
6597748	VXF042Z05S16XD09	42	28	16	37	32	1,5	5	.8°	34000	Yes	0,16
6597750	VXF050Z07S22XD09	50	34	22	42	40	1,5	7	.7°	30000	Yes	0,28
6597749	VXF050Z05S22XD09	50	36	22	42	40	1,5	5	.7°	30000	Yes	0,29
6597751	VXF052Z06S22XD09	52	38	22	42	40	1,5	6	.7°	29500	Yes	0,30
6597755	VXF063Z06S22XD09	63	49	22	42	40	1,5	6	.5°	26000	Yes	0,40

NOTE: Please order wrench separately.

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-09 • XDPT-MM

- first choice
- alternate choice

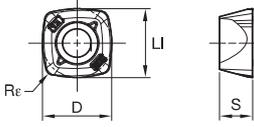


P	●	●	●
M	●	●	●
K	○	○	○
N	○	○	○
S	○	○	○
H	○	○	○

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WP40PM	WS40PM
XDPT090412ERMM	4	10,00	4,76	10,00	1,20	6596471	I	6596472

VXF-09 • XDPT-MH

- first choice
- alternate choice



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

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WP40PM	WS40PM
XDPT090412SRMH	4	10,00	4,76	10,00	1,20	I	6596822	I

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

VXF-09 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
P3-P4	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
P5-P6	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
M1-M2	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
M3	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
S1-S2	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
S3	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
S4	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM

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

Material Group		WP25PM			WP40PM			WS40PM		
P	1	395	340	325	355	310	295	-	-	-
	2	330	290	240	300	260	215	-	-	-
	3	305	260	210	275	235	190	-	-	-
	4	270	220	180	245	205	160	-	-	-
	5	220	205	180	205	185	160	205	175	145
	6	200	150	120	180	140	110	180	130	95
M	1	245	215	200	235	205	185	250	205	170
	2	220	190	155	210	180	150	215	175	145
	3	170	145	115	155	140	110	175	130	100
S	1	50	40	30	50	40	35	50	40	30
	2	50	40	30	50	40	35	50	40	30
	3	60	50	30	60	50	35	60	50	30
	4	85	60	40	80	60	40	70	60	35

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

VXF-09 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 0,90 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
.E..MM	0,48	1,42	2,20	0,35	1,00	1,52	0,26	0,74	1,11	0,23	0,64	0,96	0,21	0,59	0,88	.E..MM
.S..MH	0,70	1,58	2,65	0,50	1,11	1,80	0,37	0,82	1,31	0,33	0,71	1,14	0,30	0,65	1,04	.S..MH

At 1,10 Axial Depth of Cut (Ap1)

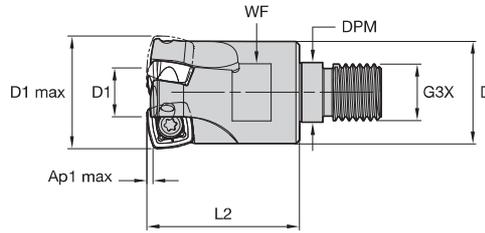
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
.E..MM	0,44	1,28	1,98	0,32	0,90	1,37	0,24	0,67	1,01	0,21	0,58	0,87	0,19	0,53	0,80	.E..MM
.S..MH	0,64	1,42	2,37	0,45	1,00	1,63	0,34	0,74	1,19	0,30	0,64	1,03	0,27	0,59	0,94	.S..MH

At 1,50 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
.E..MM	0,64	1,42	2,37	0,45	1,00	1,63	0,34	0,74	1,19	0,30	0,64	1,03	0,27	0,59	0,94	.E..MM
.S..MH	0,55	1,22	2,01	0,39	0,86	1,39	0,29	0,64	1,02	0,25	0,55	0,89	0,23	0,51	0,81	.S..MH

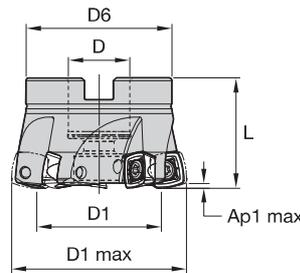
NOTE: Use "Light Machining" values as starting feed rate.

VXF-12 • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596723	VXF032Z03M16XD12	32	14	29	17,0	M16	43	24	2,5	3	1.8°	31500	Yes	0,19

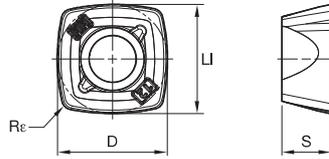
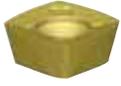
VXF-12 • Shell Mills • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596725	VXF040Z04S22XD12	40	22	22	38	40	2,5	4	1.4°	26500	Yes	0,19
6596727	VXF042Z04S22XD12	42	24	22	38	40	2,5	4	1.3°	25500	Yes	0,21
6596728	VXF050Z04S22XD12	50	32	22	48	40	2,5	4	.9°	22500	Yes	0,31
6596729	VXF052Z05S22XD12	52	34	22	48	40	2,5	5	.8°	22000	Yes	0,32
6596730	VXF063Z05S22XD12	63	45	22	53	40	2,5	5	.6°	19500	Yes	0,47
6596732	VXF066Z06S27XD12	66	48	27	53	45	2,5	6	.5°	19000	Yes	0,55
6596733	VXF080Z06S27XD12	80	62	27	55	50	2,5	6	.5°	17000	Yes	0,87
6596734	VXF100Z07S32XD12	100	82	32	65	50	2,5	7	.3°	15000	Yes	1,34

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-12 • XDPT-MM

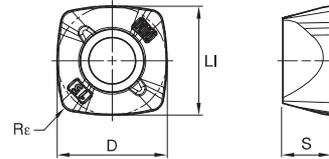
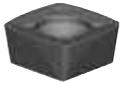


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WP40PM	WS40PM
XDPT120512ERMM	4	12,70	5,56	12,70	1,20	6596438	I	6596439

VXF-12 • XDPT-MH



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WP40PM	WS40PM
XDPT120515SRMH	4	12,70	5,56	12,70	1,50	I	6596440	I

VXF-12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
P3-P4	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
P5-P6	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
M1-M2	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
M3	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
S1-S2	XDPT-MM	WP25PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
S3	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM
S4	XDPT-MM	WS40PM	XDPT-MM	WS40PM	XDPT-MH	WP40PM

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

Material Group		WP25PM			WP40PM			WS40PM		
P	1	395	340	325	355	310	295	-	-	-
	2	330	290	240	300	260	215	-	-	-
	3	305	260	210	275	235	190	-	-	-
	4	270	220	180	245	205	160	-	-	-
	5	220	205	180	205	185	160	205	175	145
	6	200	150	120	180	140	110	180	130	95
M	1	245	215	200	235	205	185	250	205	170
	2	220	190	155	210	180	150	215	175	145
	3	170	145	115	155	140	110	175	130	100
S	1	50	40	30	50	40	35	50	40	30
	2	50	40	30	50	40	35	50	40	30
	3	60	50	30	60	50	35	60	50	30
	4	85	60	40	80	60	40	70	60	35

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

VXF-12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 1,30 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%		10%		20%		30%		40-100%							
.E..MM	0,49	1,59	2,52	0,35	1,13	1,78	0,26	0,84	1,31	0,23	0,73	1,14	0,21	0,67	1,04	.E..MM
.S..MH	0,70	1,80	2,76	0,51	1,28	1,94	0,38	0,95	1,44	0,33	0,83	1,25	0,30	0,76	1,14	.S..MH

At 1,70 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%		10%		20%		30%		40-100%							
.E..MM	0,43	1,39	2,20	0,31	0,99	1,56	0,23	0,74	1,15	0,20	0,64	1,00	0,19	0,59	0,92	.E..MM
.S..MH	0,62	1,57	2,41	0,45	1,12	1,70	0,33	0,84	1,26	0,29	0,73	1,10	0,27	0,67	1,00	.S..MH

At 2,50 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%		10%		20%		30%		40-100%							
.E..MM	0,36	1,15	1,81	0,26	0,83	1,29	0,19	0,62	0,96	0,17	0,54	0,83	0,15	0,49	0,76	.E..MM
.S..MH	0,51	1,30	1,99	0,37	0,93	1,41	0,28	0,70	1,05	0,24	0,61	0,91	0,22	0,55	0,83	.S..MH

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

INDEXABLE MILLING

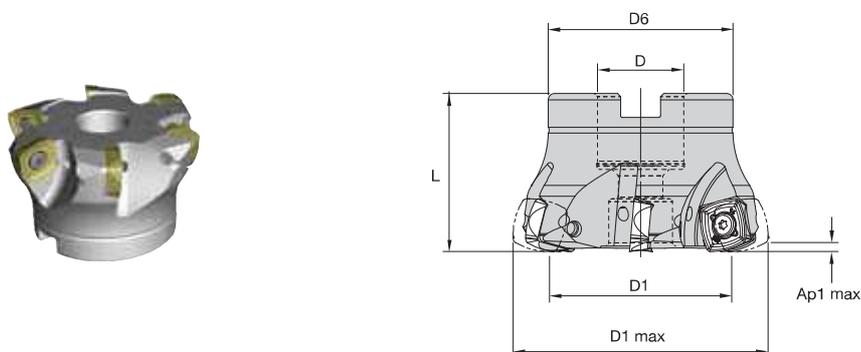
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

VXF-16 • Shell Mills • Metric



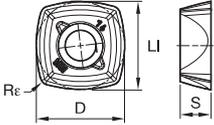
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597776	VXF050Z04S22XE16	50	27	22	45	45	3,5	4	1.4°	25100	Yes	0,29
6597777	VXF063Z05S22XE16	63	40	22	47	40	3,5	5	.9°	21400	Yes	0,36
6597778	VXF080Z06S27XE16	80	57	27	58	50	3,5	6	.6°	18300	Yes	0,85
6597779	VXF100Z08S32XE16	100	77	32	68	50	3,5	8	.4°	16000	Yes	1,29
6597780	VXF125Z10S40XE16	125	102	40	84	63	3,5	10	.3°	14000	Yes	2,73

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VXF-16 • XEPT-MM

- first choice
- alternate choice



P	●	●
M	●	●
K	○	○
N	○	○
S	●	●
H	○	○

ISO catalogue number	cutting edges	LI	S	D	Re	WP25PM	WS40PM
XEPT160516ERMM	4	16,00	5,56	16,00	1,60	6596823	6596824

INDEXABLE MILLING

SOLID END MILLING

HOLE/MAKING

TAPPING

TURNING

VXF-16 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	XEPT-MM	WP25PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
P3-P4	XEPT-MM	WP25PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
P5-P6	XEPT-MM	WP25PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
M1-M2	XEPT-MM	WS40PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
M3	XEPT-MM	WS40PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
S1-S2	XEPT-MM	WP25PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
S3	XEPT-MM	WS40PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM
S4	XEPT-MM	WS40PM	XEPT-MM	WS40PM	XEPT-MM	WS40PM

VXF-16 • Recommended Starting Speeds [m/min]

Material Group		WP25PM			WS40PM		
P	1	395	340	325	-	-	-
	2	330	290	240	-	-	-
	3	305	260	210	-	-	-
	4	270	220	180	-	-	-
	5	220	205	180	205	175	145
	6	200	150	120	180	130	95
M	1	245	215	200	250	205	170
	2	220	190	155	215	175	145
	3	170	145	115	175	130	100
S	1	50	40	30	50	40	30
	2	50	40	30	50	40	30
	3	60	50	30	60	50	30
	4	85	60	40	70	60	35

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

VXF-16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 2,00 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
.E..MM	0,40	1,28	2,18	0,29	0,92	1,54	0,21	0,68	1,14	0,19	0,60	0,99	0,17	0,55	0,91	.E..MM

At 2,50 Axial Depth of Cut (Ap1)

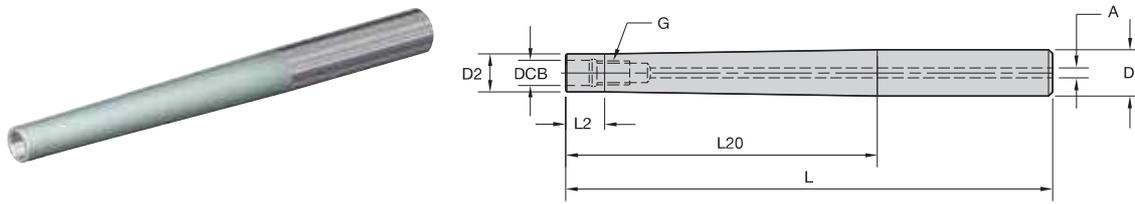
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
.E..MM	0,36	1,15	1,95	0,26	0,83	1,38	0,19	0,62	1,03	0,17	0,54	0,89	0,15	0,49	0,82	.E..MM

At 3,50 Axial Depth of Cut (Ap1)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
.E..MM	0,30	0,98	1,66	0,22	0,71	1,18	0,17	0,53	0,88	0,14	0,46	0,76	0,13	0,42	0,70	.E..MM

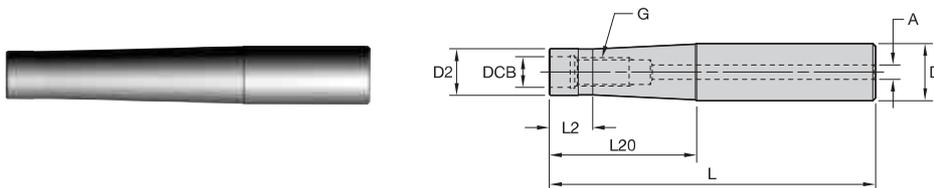
NOTE: Use "Light Machining" values as starting feed rate.

Cylindrical Shank Extensions for Modular Heads • Screw-On Adapters • Metric



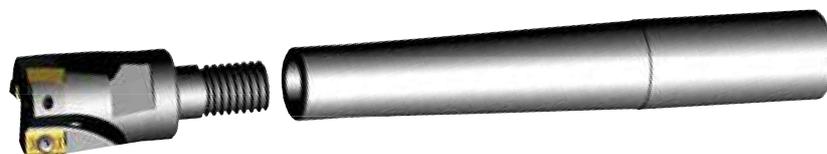
order number	catalogue number	DCB	G	D	D2	A	L	L2	L20
4160427	SS120STCHM06085M	6,5	M6	12	10	2,5	85	10	40
4160428	SS120STCHM06105M	6,5	M6	12	10	2,5	105	10	60
4160430	SS120STCHM06125M	6,5	M6	12	10	2,5	125	10	80
4160431	SS160STCHM08088M	8,5	M8	16	13	3,0	88	10	40
4160432	SS160STCHM08108M	8,5	M8	16	13	3,0	108	10	60
4160473	SS160STCHM08128M	8,5	M8	16	13	3,0	128	10	80
4160474	SS160STCHM08148M	8,5	M8	16	13	3,0	148	10	100
4160475	SS160STCHM08168M	8,5	M8	16	13	3,0	168	10	120
4160476	SS200STCHM10090M	10,5	M10	20	18	3,5	90	10	40
4160477	SS200STCHM10110M	10,5	M10	20	18	3,5	110	10	60
4160478	SS200STCHM10130M	10,5	M10	20	18	3,5	130	10	80
4160479	SS200STCHM10150M	10,5	M10	20	18	3,5	150	10	100
4160480	SS200STCHM10170M	10,5	M10	20	18	3,5	170	10	130

Cylindrical Shank Extensions for Modular Heads • Metric

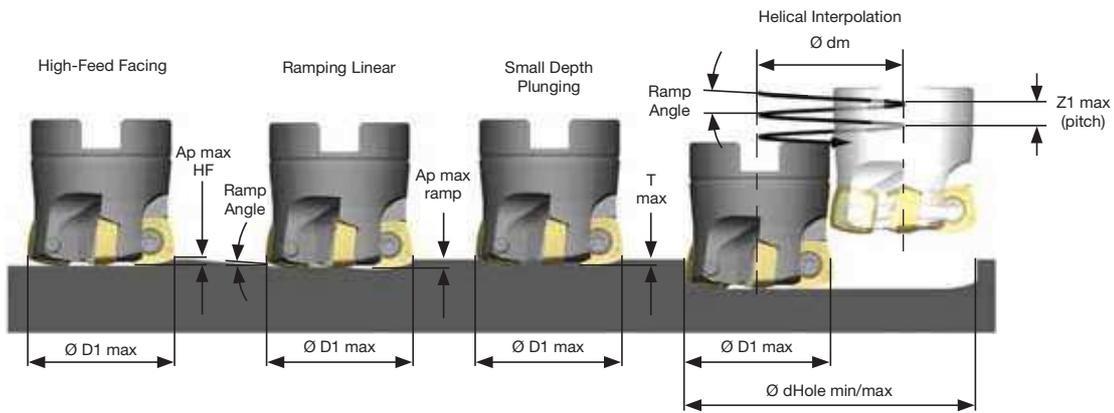


order number	catalogue number	DCB	G	D	D2	A	L	L2	L20
5672985	M-21-M12-CA25-131	12,50	M12	25	21	5	131	12	75
5672468	M-21-M12-CA25-156	12,50	M12	25	21	5	156	12	100
5672986	M-21-M12-CA25-181	12,50	M12	25	21	5	181	12	125
5672831	M-21-M12-CA25-206	12,50	M12	25	21	5	206	12	150
5672987	M-21-M12-CA25-231	12,50	M12	25	21	5	231	12	175
5672832	M-29-M16-CA32-160	17,00	M16	32	29	5	160	16	100
5672988	M-29-M16-CA32-210	17,00	M16	32	29	5	210	16	150
5673783	M-29-M16-CA32-260	17,00	M16	32	29	5	260	16	200
5672989	M-29-M16-CA32-310	17,00	M16	32	29	5	310	16	250

NOTE: Cylindrical shank extensions can be used with all modular heads found in several product family series.



Best Practices



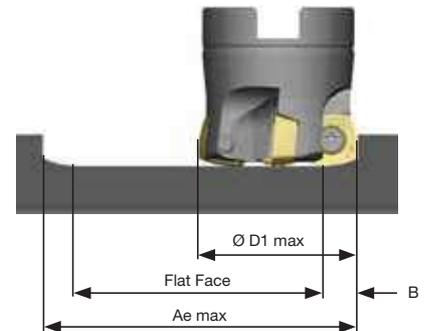
series	D1 max	High-feed Facing	Ramping Linear		Helical Interpolation			Small Depth Plunging	
		Ap max HF	Ramp Angle max	Ap max Ramp	Ramp Angle max	d Hole min	d Hole max	Z1 max Helical	T max
VXF-07	16	0,60	5,9	0,60	5,9	22,0	30,0	0,60	0,45
	18	0,60	5,4	0,60	5,4	24,0	34,0	0,60	0,45
	20	0,60	3,4	0,60	3,4	30,0	38,0	0,60	0,30
	25	0,60	2,2	0,60	2,2	40,0	48,0	0,60	0,30
	32	0,60	1,4	0,60	1,4	54,0	62,0	0,60	0,30
	40	0,60	1,0	0,60	1,0	70,0	78,0	0,60	0,30
	50	0,60	0,7	0,60	0,7	90,0	98,0	0,60	0,30
VXF-09	25	0,90	2,8	1,00	2,8	34,0	48,0	1,00	0,65
	32	0,90	1,5	1,00	1,5	48,0	62,0	1,00	0,65
	35	0,90	1,3	1,00	1,3	54,0	68,0	1,00	0,65
	40	0,90	0,8	1,00	0,8	64,0	78,0	1,00	0,65
	42	0,90	0,8	1,00	0,8	68,0	82,0	1,00	0,65
	50	0,90	0,7	1,00	0,7	84,0	98,0	1,00	0,65
	52	0,90	0,7	1,00	0,7	88,0	102,0	1,00	0,65
63	0,90	0,5	1,00	0,7	106,0	124,0	1,00	0,65	
VXF-12	32	1,30	1,8	1,80	1,8	42,0	62,0	1,80	0,80
	40	1,30	1,4	1,80	1,4	58,0	78,0	1,80	0,80
	42	1,30	1,3	1,80	1,3	62,0	82,0	1,80	0,80
	50	1,30	0,9	1,80	0,9	78,0	98,0	1,80	0,80
	52	1,30	0,8	1,80	0,8	82,0	102,0	1,80	0,80
	63	1,30	0,6	1,80	0,6	104,0	124,0	1,80	0,80
	66	1,30	0,5	1,80	0,5	110,0	130,0	1,80	0,80
	80	1,30	0,5	1,80	0,5	138,0	158,0	1,80	0,80
100	1,30	0,3	1,80	0,3	178,0	198,0	1,80	0,80	
VXF-16	50	2,00	1,4	2,50	1,4	70,0	98,0	2,50	0,70
	63	2,00	0,9	2,50	0,9	96,0	124,0	2,50	0,70
	80	2,00	0,6	2,50	0,6	130,0	158,0	2,50	0,70
	100	2,00	0,4	2,50	0,4	170,0	198,0	2,50	0,70
	125	2,00	0,3	2,50	0,3	220,0	248,0	2,50	0,70

$$\varnothing dm = \varnothing \text{Hole} - \varnothing D1 \text{ max}$$

$$Z1 = \varnothing dm \times 3,14 \times \tan \text{ramp angle}. Z1 \leq Z1 \text{ max and } \leq \text{ramp angle max}$$

$$\text{Ramp angle} = \arctan \left(\frac{Z1}{\varnothing dm \times 3,14} \right)$$

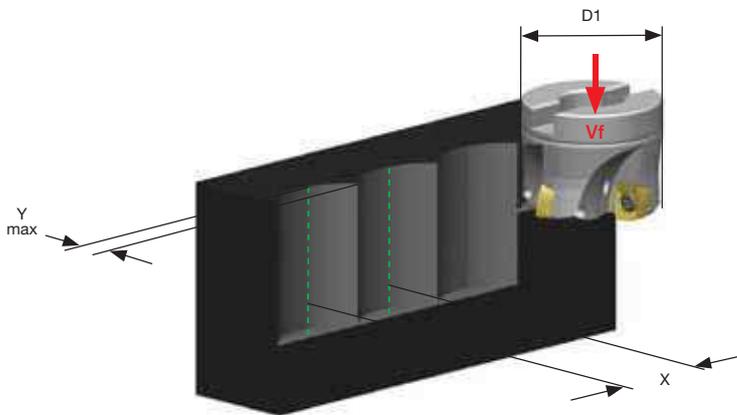
series	D1 max	X
VXF-07	16-50	4,20
VXF-09	25-63	6,80
VXF-12	32-100	9,10
VXF-16	50-125	11,40



$$Ae \text{ max} \leq 2 \times \varnothing D1 \text{ max} - 2 \times B$$

$$\text{Flat Face} = Ae \text{ max} - 2 \times B$$

Z-Axis Plunge Milling



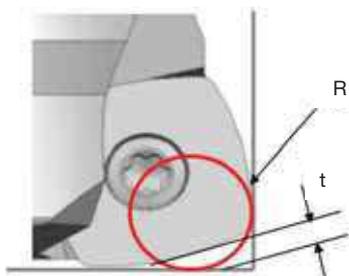
VXF-07			VXF-09			VXF-12			VXF-16		
D1 max	Y max	X									
16	3	12,49	25	6	21,35	32	9	28,77	50	13	43,86
18	3	13,41	32	6	24,98	40	9	33,40	63	13	50,99
20	3	14,28	35	6	26,38	42	9	34,46	80	13	59,02
25	3	16,24	40	6	28,56	50	9	38,41	100	13	67,26
32	3	18,65	42	6	29,39	52	9	39,34	125	13	76,31
40	3	21,07	50	6	32,49	63	9	44,09			
50	3	23,74	52	6	33,22	66	9	45,29			
			63	6	36,98	80	9	50,55			
						100	9	57,23			

Feed Rate Guide • Z-Axis Plunge Milling • fz (mm/tooth)

Insert Geometry	Recommended Starting Feed per Tooth (Fz)			Insert Geometry	Y max
	Light Machining	General Purpose	Heavy Machining		
VXF-07	.E..MM	0,06	0,15	.E..MM	3,0
	.S..MH	0,10	0,20		
VXF-09	.E..MM	0,07	0,20	.E..MM	6,0
	.S..MH	0,10	0,22		
VXF-12	.E..MM	0,07	0,20	.E..MM	9,0
	.S..MH	0,10	0,25		
VXF-16	.E..MM	0,07	0,23	.E..MM	13,0

CAM Programming

Programming Data			
insert size	insert radius	R (to be programmed)	t
07	0,8	1,4	0,4
	1,0	1,5	0,4
09	0,8	2,0	0,72
	1,2	2,3	0,67
12	1,2	2,7	0,97
	1,5	2,8	0,95
16	1,2	4,2	1,46

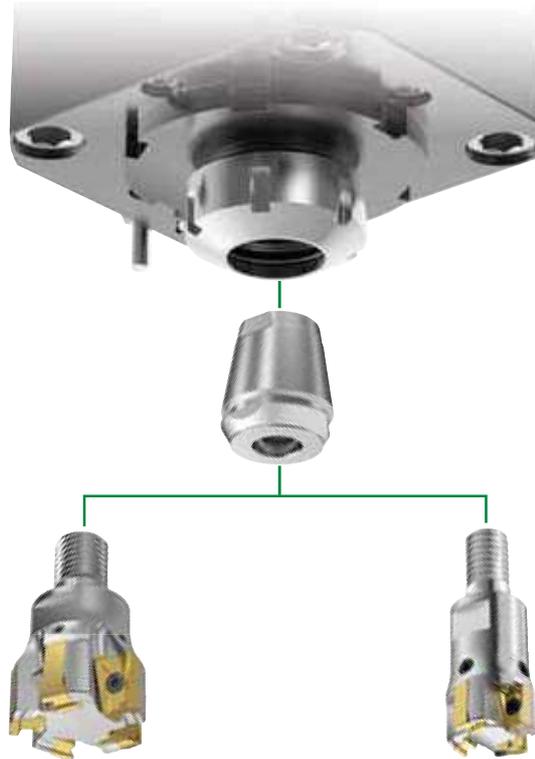


Solid ER Collets

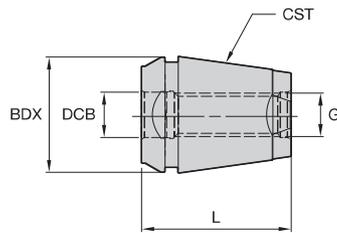
Threaded solid ER collets turn CNC lathe machines into multitasking machines by providing access of any small diameter screw-on milling cutter to ER driven units.

These new solid ER collets increase machine utilization through modular flexibility.

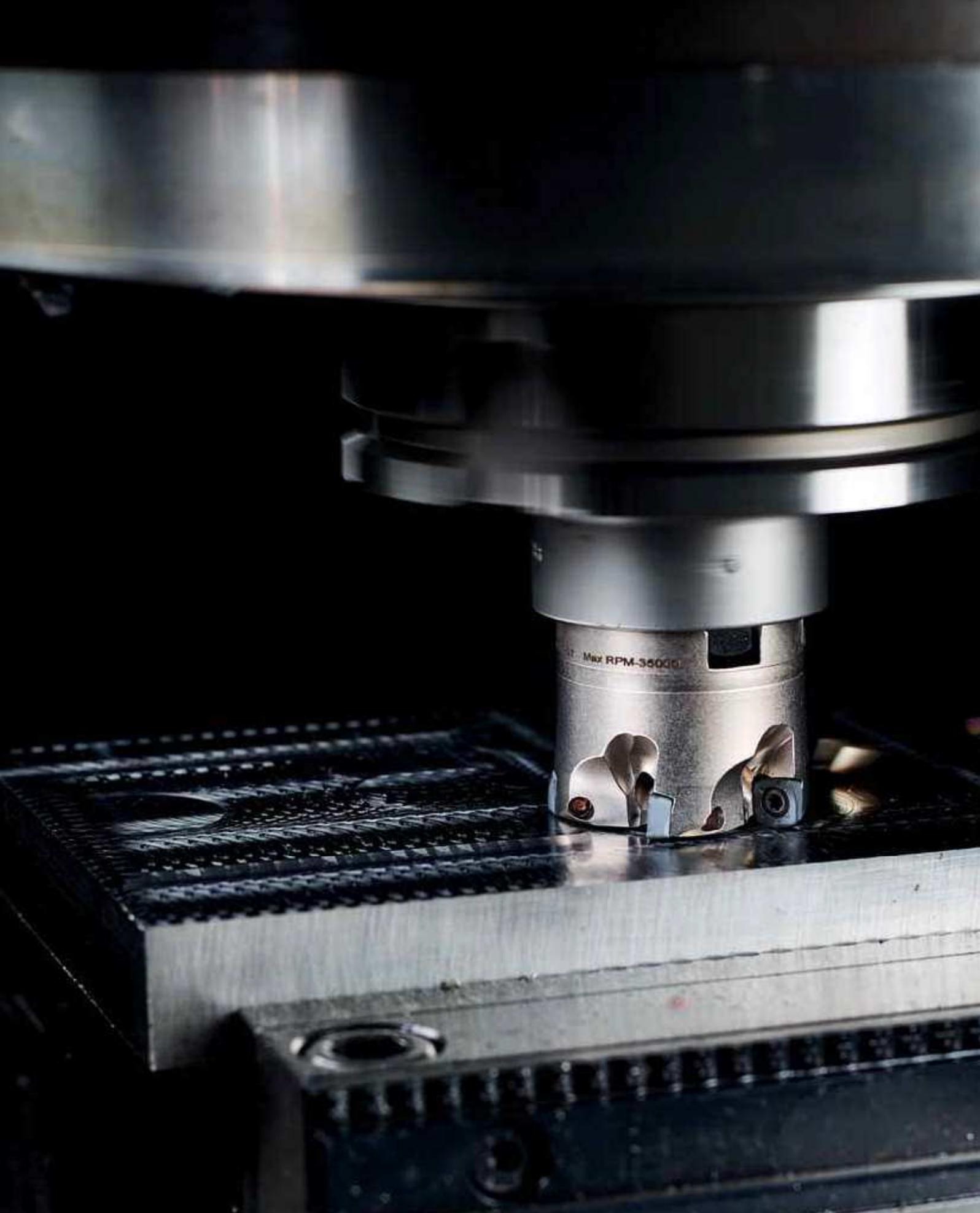
The short projection from the face of the collet nut provides rigid toolholding and a smaller required machine envelope.



ERICKSON™



order number	catalogue number	collet capacity min		G	BDX	L
		CST	mm			
6587968	ER25STM08	ER25	9	M8	26	35
6587969	ER25STM10	ER25	11	M10	26	35
6587970	ER25STM12	ER25	13	M12	26	35
6588001	ER32STM08	ER32	9	M8	33	41
6588002	ER32STM10	ER32	11	M10	33	41
6588003	ER32STM12	ER32	13	M12	33	41
6588004	ER32STM16	ER32	17	M16	33	41
6588005	ER40STM08	ER40	9	M8	41	47
6588006	ER40STM10	ER40	11	M10	41	47
6588007	ER40STM12	ER40	13	M12	41	47
6588008	ER40STM16	ER40	17	M16	41	47



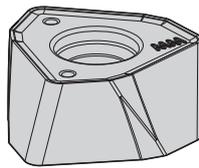
M370™ Series

M370 IC08, M370 IC12 Copy Mills

The M370 Series is a six-edged copy mill designed for high feed rate productivity in steel and cast iron materials.



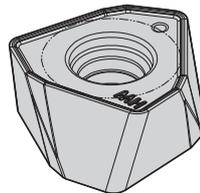
iC08 and iC12 inserts offered in THREE Geometries



-MM



Designed for lower cutting forces. First choice for steel, stainless steel, and high-temp alloys.



-MH



This insert has a strong cutting edge, making it a first choice for hard machining applications up to 48 HRC.



-MR



Designed for heavy-duty steel and cast iron applications.

HIGH-FEED ROUGHING

PRODUCT

SERIES

M370™

DIAMETER RANGE

25–125mm

SHANK TYPES

Screw-On End Mills
Weldon® End Mills
Shell Mills

INDUSTRY



APPLICATIONS



3D
PROFILING



SLOTTING:
SIDE MILLING



SLOTTING:
SQUARE END



FACE
MILLING



RAMPING
BLANK



POCKETING



HELICAL
MILLING



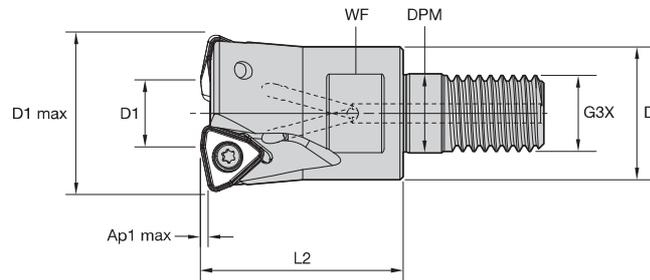
PLUNGE
MILLING



THROUGH
COOLANT:
RADIAL:
INDEXABLE
MILLING

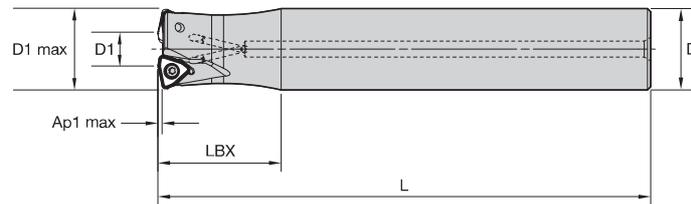


M370 • Screw-On End Mills • W008.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4056186	M370D025Z02M12W008	25	11	21	12,5	M12	35	17	1,3	2	2.1	46000	Yes	0,09
4170918	M370D025Z03M12W008	25	11	21	12,5	M12	35	17	1,3	3	2.1	46000	Yes	0,09
4056187	M370D032Z04M16W008	32	18	29	17,0	M16	43	24	1,3	4	1.4	38700	Yes	0,21
4056188	M370D042Z05M16W008	42	28	29	17,0	M16	43	24	1,3	5	1.0	32500	Yes	0,57

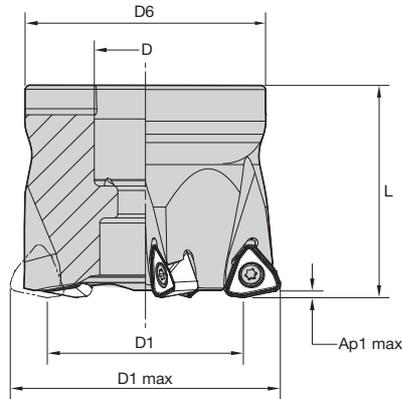
M370 • Cylindrical Shank • W008.. • Metric



order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4056189	M370D025Z03A25W008L150	25	11	25	150	40	1,3	3	46000	Yes	0,50
4008281	M370D025Z02A25W008L200	25	11	25	200	50	1,3	2	46000	Yes	0,68
4170919	M370D025Z03A25W008L200	25	11	25	200	40	1,3	3	46000	Yes	0,69
4170920	M370D025Z02A25W008L300	25	11	25	300	40	1,3	2	46000	Yes	1,08
4056190	M370D028Z03A25W008L200	28	14	25	200	40	1,3	3	42400	Yes	0,70
4056192	M370D032Z04A32W008L200	32	18	32	200	50	1,3	4	38700	Yes	1,14
4056191	M370D032Z04A32W008L150	32	18	32	150	40	1,3	4	38700	Yes	0,84
4170921	M370D032Z03A32W008L300	32	18	32	300	40	1,3	3	38700	Yes	1,77

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M370 • Shell Mills • W008... • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4056193	M370D040Z04W008	40	26	16	37	40	1,3	4	33500	Yes	0,19
4170922	M370D040Z05W008	40	26	16	37	40	1,3	5	33500	Yes	0,19
4008276	M370D050Z05W008	50	36	22	44	40	1,3	5	29200	Yes	0,29
4171223	M370D050Z06W008	50	36	22	44	40	1,3	6	29200	Yes	0,29
4171224	M370D052Z06W008	52	38	22	44	50	1,3	6	28600	Yes	0,40
4056194	M370D052Z05W008	52	38	22	44	50	1,3	5	28600	Yes	0,41
4056195	M370D063Z06W008	63	49	22	60	50	1,3	6	25500	Yes	0,74
4008277	M370D066Z06W008	66	52	27	60	50	1,3	6	24900	Yes	0,77
4171225	M370D080Z07W008	80	66	27	60	50	1,3	7	24900	Yes	2,36

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

INDEXABLE MILLING

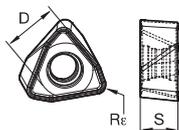
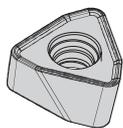
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M370 • WOEJ-MH • W00804..

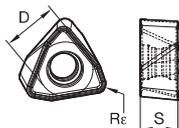


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ080412SRMH	6	7,79	4,75	1,22	●	○	○	○	○	○	○	○	○

M370 • WOEJ-MM • W00804..



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	TN6525	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
WOEJ080412SRMM	6	7,79	4,70	1,22	○	○	○	○	○	○	○	○	○

M370 • 08 • 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	-	-	-	-

M370 • 08 • Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			WK15CM			WP25PM			WP35CM		
P	1	410	320	280	360	280	240	-	-	-	395	340	325	455	395	370
	2	320	250	215	250	190	170	-	-	-	330	290	240	280	255	230
	3	280	215	185	215	170	140	-	-	-	305	260	210	255	230	205
	4	235	170	145	180	130	110	-	-	-	270	220	180	190	175	160
	5	310	235	200	240	180	150	-	-	-	220	205	180	260	230	210
	6	205	160	130	160	120	100	-	-	-	200	150	120	160	135	110
M	1	190	120	80	130	80	60	-	-	-	245	215	200	205	185	155
	2	120	80	50	80	50	40	-	-	-	220	190	155	185	160	140
	3	125	80	55	85	50	40	-	-	-	170	145	115	145	130	115
K	1	275	245	220	220	205	180	505	460	410	275	245	220	295	265	240
	2	215	190	180	175	155	140	400	355	330	215	190	180	235	210	190
	3	180	160	145	155	145	125	335	300	275	180	160	145	195	175	160
N	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	50	35	30	-	-	-	50	40	30	-	-	-
	2	-	-	-	25	20	10	-	-	-	50	40	30	-	-	-
	3	-	-	-	70	40	30	-	-	-	60	50	30	-	-	-
	4	-	-	-	60	30	25	-	-	-	85	60	40	66	50	33
H	1	-	-	-	-	-	-	-	-	-	145	110	85	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Group		WP40PM			WS30PM			WS40PM			WU35PM		
P	1	355	310	295	-	-	-	-	-	-	260	230	215
	2	300	260	215	-	-	-	-	-	-	220	190	160
	3	275	235	190	-	-	-	-	-	-	200	170	140
	4	245	205	160	-	-	-	-	-	-	180	150	120
	5	205	185	160	-	-	-	440	325	230	150	135	120
	6	180	140	110	-	-	-	375	260	165	130	100	80
M	1	235	205	185	270	240	220	850	605	375	170	150	135
	2	210	180	150	245	215	175	755	560	345	155	130	110
	3	155	140	110	185	160	125	625	440	280	115	100	80
K	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
S	1	50	40	35	55	50	35	200	145	90	35	30	25
	2	50	40	35	55	50	35	180	130	85	35	30	25
	3	60	50	35	65	55	35	210	150	95	45	35	25
	4	80	60	40	100	70	50	295	215	135	60	45	30
H	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-

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

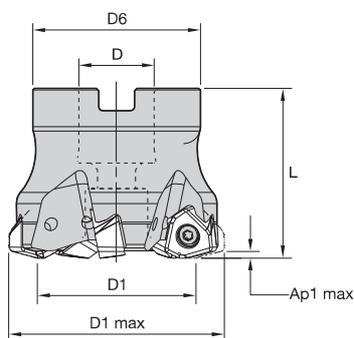
M370 • 08 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
..MM	0,90	1,67	4,09	0,65	1,19	2,83	0,48	0,88	2,08	0,42	0,77	1,80	0,38	0,70	1,64	..MM
..MH	0,90	2,34	5,00	0,65	1,66	3,41	0,48	1,23	2,49	0,42	1,07	2,16	0,38	0,98	1,97	..MH

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

M370 • Shell Mills • W012... • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5338913	M370D50Z04W012	50,0	33	22	42	50	2,0	4	19530	Yes	0,38
5338914	M370D52Z04W012	52,0	35	22	49	50	2,0	4	19160	Yes	0,47
5338915	M370D63Z04W012	63,0	46	22	49	50	2,0	4	17400	Yes	0,57
5338916	M370D63Z05W012	63,0	46	22	49	50	2,0	5	17400	Yes	0,57
5338917	M370D66Z05W012	66,0	49	27	60	50	2,0	5	17000	Yes	0,79
5338918	M370D80Z05W012	80,0	63	27	60	50	2,0	5	15440	Yes	0,94
5338919	M370D80Z06W012	80,0	63	27	60	50	2,0	6	15440	Yes	0,94
5338920	M370D100Z06W012	100,0	83	32	78	50	2,0	6	13810	Yes	1,56
5338921	M370D100Z07W012	100,0	83	32	78	50	2,0	7	13810	Yes	1,57
5338922	M370D125Z07W012	125,0	108	40	90	63	2,0	7	12350	Yes	2,92
5338923	M370D125Z09W012	125,0	108	40	90	63	2,0	9	12350	Yes	2,94

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M370 • 12 • 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	-	-

M370 • 12 • Recommended Starting Speeds [m/min]

Material Group		TN6525			TN6540			WK15CM			WP25PM			WP35CM		
		P	1	410	320	280	360	280	240	-	-	-	395	340	325	455
	2	320	250	215	250	190	170	-	-	-	330	290	240	280	255	230
	3	280	215	185	215	170	140	-	-	-	305	260	210	255	230	205
	4	235	170	145	180	130	110	-	-	-	270	220	180	190	175	160
	5	310	235	200	240	180	150	-	-	-	220	205	180	260	230	210
	6	205	160	130	160	120	100	-	-	-	200	150	120	160	135	110
M	1	190	120	80	130	80	60	-	-	-	245	215	200	205	185	155
	2	120	80	50	80	50	40	-	-	-	220	190	155	185	160	140
	3	125	80	55	85	50	40	-	-	-	170	145	115	145	130	115
K	1	275	245	220	220	205	180	505	460	410	275	245	220	295	265	240
	2	215	190	180	175	155	140	400	355	330	215	190	180	235	210	190
	3	180	160	145	155	145	125	335	300	275	180	160	145	195	175	160
N	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	50	35	30	-	-	-	50	40	30	-	-	-
	2	-	-	-	25	20	10	-	-	-	50	40	30	-	-	-
	3	-	-	-	70	40	30	-	-	-	60	50	30	-	-	-
	4	-	-	-	60	30	25	-	-	-	85	60	40	66	50	33
H	1	-	-	-	-	-	-	-	-	-	145	110	85	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Group		WP40PM			WS30PM			WS40PM			WU35PM		
		P	1	355	310	295	-	-	-	-	-	-	260
	2	300	260	215	-	-	-	-	-	-	220	190	160
	3	275	235	190	-	-	-	-	-	-	200	170	140
	4	245	205	160	-	-	-	-	-	-	180	150	120
	5	205	185	160	-	-	-	440	325	230	150	135	120
	6	180	140	110	-	-	-	375	260	165	130	100	80
M	1	235	205	185	270	240	220	850	605	375	170	150	135
	2	210	180	150	245	215	175	755	560	345	155	130	110
	3	155	140	110	185	160	125	625	440	280	115	100	80
K	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
S	1	50	40	35	55	50	35	200	145	90	35	30	25
	2	50	40	35	55	50	35	180	130	85	35	30	25
	3	60	50	35	65	55	35	210	150	95	45	35	25
	4	80	60	40	100	70	50	295	215	135	60	45	30
H	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-

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

M370 • 12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
..MM	0,90	1,87	3,62	0,65	1,33	2,52	0,48	0,99	1,86	0,42	0,86	1,61	0,39	0,79	1,47	..MM
..MH	0,90	2,35	4,97	0,65	1,67	3,40	0,48	1,23	2,48	0,42	1,07	2,15	0,39	0,98	1,96	..MH
..MR	0,90	2,81	5,44	0,65	1,97	3,69	0,48	1,46	2,69	0,42	1,27	2,33	0,39	1,16	2,13	..MR

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M200™ Series

M200 IC10, M200 IC12, M200 IC16 Copy Mills

The M200 copy mill is a double-sided round insert series with an effective anti-rotation feature and 12 cutting edges per insert to tackle pocketing and face milling operations in power generation and general engineering applications.

Double-sided insert with up to 12 cutting edges for a more productive cutting process.

Effective anti-rotation feature.

Able to apply in all type of materials and milling applications.

Marking provided in cutter body for proper alignment of insert in pocket.



M200 iC10

10mm iC insert
8 cutting edges

-ALP



N

For non-ferrous materials.

-ML



P M S

First choice for stainless steel and high-temp alloys.

-MM



P M S

First choice for general purpose, especially for steel.

-MH



P K

First choice for heavy machining and cast iron.

M200 iC12

12mm iC insert
12 cutting edges

-ALP



N

For non-ferrous materials.

-ML



P M S

First choice for stainless steel and high-temp alloys.

-MM



P M S

First choice for general purpose, especially for steel.

-MH



P K

First choice for heavy machining and cast iron.

M200 iC16

16mm iC insert
12 cutting edges

-ALP



N

For non-ferrous materials.

-ML



P M S

First choice for stainless steel and high-temp alloys.

-MM



P M S

First choice for general purpose, especially for steel.

-MH



P K

First choice for heavy machining and cast iron.

DOUBLE-SIDED ROUND INSERT COPY MILLING SERIES

PRODUCT

SERIES

M200™

DIAMETER RANGE

50–80mm

SHANK TYPES

Screw-On End Mills
Cylindrical End Mills
Shell Mills

INDUSTRY



APPLICATIONS



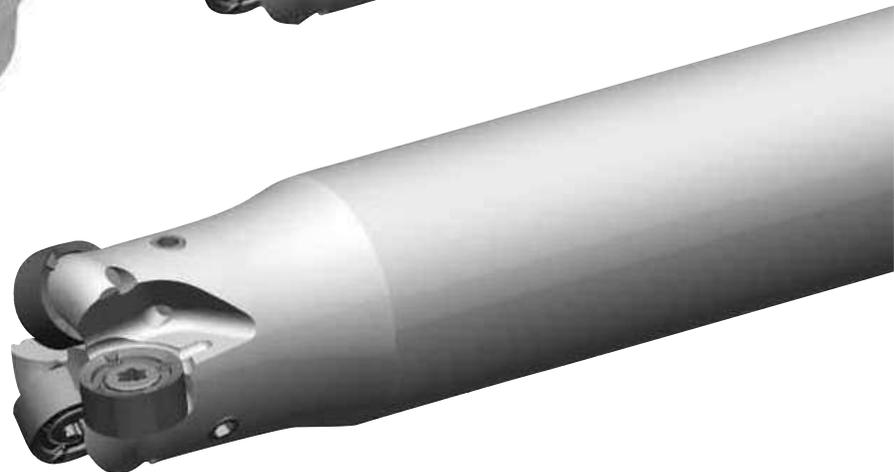
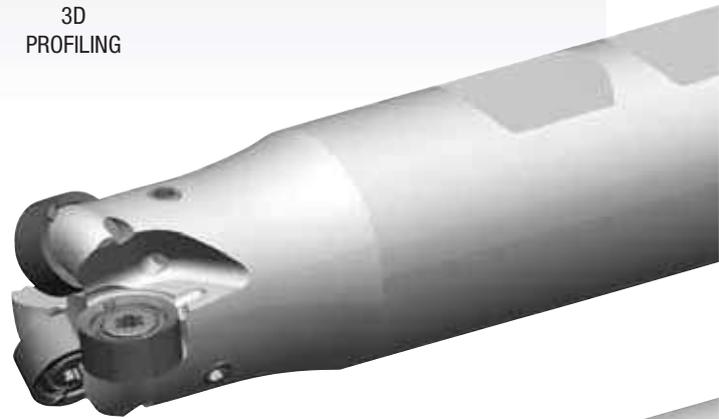
FACE
MILLING



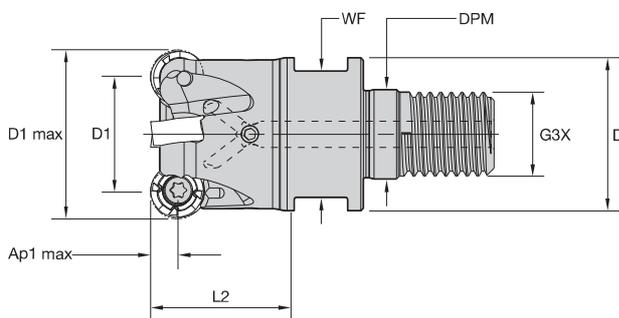
POCKETING



3D
PROFILING

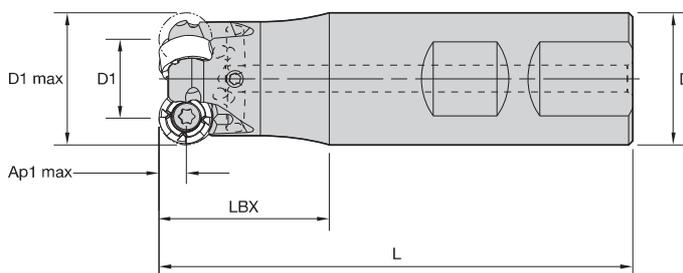


M200 • iC10 • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210273	M200D25Z03M12RN10	25	15	21	12,5	M12	32	17	5,0	3	0.6	54700	Yes	0,08
5210274	M200D32Z04M16RN10	32	22	29	17,0	M16	40	24	5,0	4	0.5	48300	Yes	0,18
5210275	M200D35Z05M16RN10	35	25	29	17,0	M16	40	24	5,0	5	0.5	46200	Yes	0,20
5210276	M200D42Z06M16RN10	42	32	29	17,0	M16	40	25	5,0	6	0.4	42200	Yes	0,24

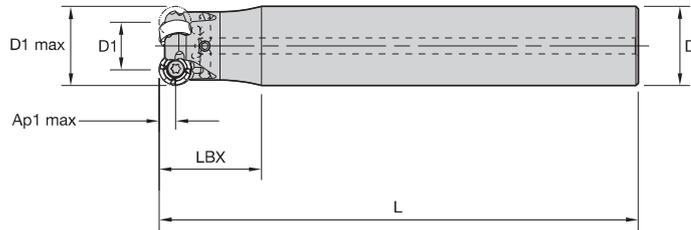
M200 • iC10 • Weldon® End Mills • Metric



order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210277	M200D25Z03B25RN10	25	15	25	89	40	5,0	3	0.6	54700	Yes	0,27
5210278	M200D32Z04B32RN10	32	22	32	101	40	5,0	4	0.5	48300	Yes	0,52

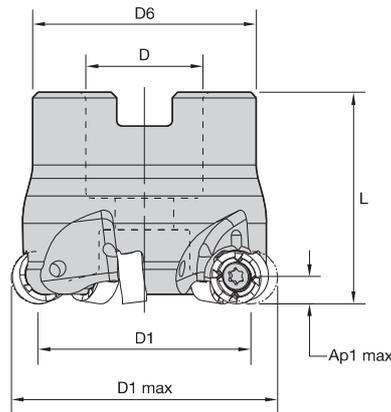
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M200 • iC10 • Cylindrical End Mills • Metric



order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210279	M200D25Z03A25RN10L150	25	15	25	150	32	5,0	3	0.6	54700	Yes	0,50
5210300	M200D25Z03A25RN10L200	25	15	25	200	32	5,0	3	0.6	54700	Yes	0,69
5210301	M200D25Z03A32RN10L250	25	15	32	250	32	5,0	3	0.6	54700	Yes	1,42
5210302	M200D28Z03A25RN10L200	28	18	25	200	40	5,0	3	0.6	51600	Yes	0,70
5210304	M200D32Z03A32RN10L200	32	22	32	200	40	5,0	3	0.5	48300	Yes	1,14
5210303	M200D32Z04A32RN10L150	32	22	32	150	40	5,0	4	0.5	48300	Yes	0,83

M200 • iC10 • Shell Mills • Metric

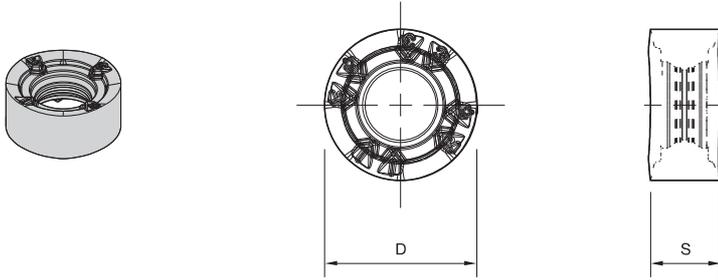


order number	catalogue number	D1 max	D1	D	D6	L	L1	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5210305	M200D40Z04RN10	40	30	16	38	40	40	5,0	4	0.4	43200	Yes	0,23
5210306	M200D40Z06RN10	40	30	16	38	40	40	5,0	6	0.4	43200	Yes	0,24
5210307	M200D50Z05RN10	50	40	22	42	40	40	5,0	5	0.3	38600	Yes	0,32
5210308	M200D50Z06RN10	50	40	22	42	40	40	5,0	6	0.3	38600	Yes	0,32
5210309	M200D52Z06RN10	52	42	22	49	50	50	5,0	6	0.3	37900	Yes	0,52

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

INDEXABLE MILLING

M200 • RN.J10... • RNGJ-ML



- first choice
- alternate choice

P	■	■	■	■	●	●	●	●	○	●	●
M	■	■	■	■	○	○	○	○	○	○	○
K	■	●	●	●	○	○	○	○	○	○	○
N	■	■	●	●	○	○	○	○	○	○	○
S	■	■	■	■	○	○	○	○	○	○	○
H	■	■	■	■	○	○	○	○	○	○	○
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM	

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ10T3M0EML	2	10,00	3,93	0,04	■	■	■	○	○	○	○	○	○	○

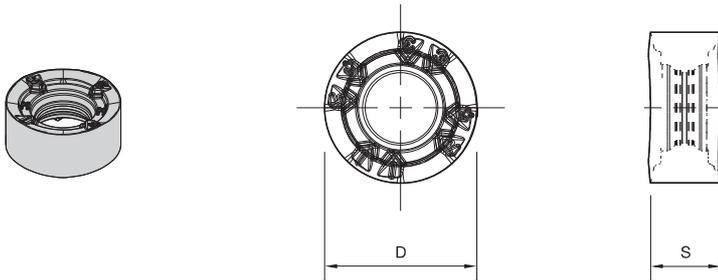
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M200 • RN.J10... • RNGJ-MM



- first choice
- alternate choice

P	■	■	■	■	●	●	●	●	○	●	●
M	■	■	■	■	○	○	○	○	○	○	○
K	■	●	●	●	○	○	○	○	○	○	○
N	■	■	●	●	○	○	○	○	○	○	○
S	■	■	■	■	○	○	○	○	○	○	○
H	■	■	■	■	○	○	○	○	○	○	○
	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM	

catalogue number	number of indexes	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ10T3M0SMM	8	10,00	3,93	0,09	■	■	■	○	○	○	○	○	○	○

M200 • RN.J10... • 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	ALP	WN25PM	ALP	WN25PM	ALP	WN25PM
N3	ALP	WN25PM	ALP	WN25PM	ALP	WN25PM
S1-S2	ML	WS30PM	MM	WS30PM	MM	WU35PM
S3	ML	WS30PM	MM	WU35PM	MM	WU35PM
S4	ML	WS30PM	MM	WU35PM	MM	WU35PM
H1	MH	WP25PM	MH	WP20CM	-	-

M200 • RN.J10... • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
		P	1	-	-	-	-	-	-	-	-	-	660	580	540	395
	2	-	-	-	-	-	-	-	-	-	410	370	330	330	290	240
	3	-	-	-	-	-	-	-	-	-	370	330	305	305	260	210
	4	-	-	-	-	-	-	-	-	-	275	260	230	270	220	180
	5	-	-	-	-	-	-	-	-	-	330	300	275	220	205	180
	6	-	-	-	-	-	-	-	-	-	230	205	175	200	150	120
M	1	-	-	-	-	-	-	-	-	-	270	240	210	245	215	200
	2	-	-	-	-	-	-	-	-	-	245	210	190	220	190	155
	3	-	-	-	-	-	-	-	-	-	190	175	150	170	145	115
K	1	505	460	410	400	290	215	-	-	-	430	390	355	275	245	220
	2	400	355	330	350	235	170	-	-	-	340	305	280	215	190	180
	3	335	300	275	280	245	165	-	-	-	290	260	240	180	160	145
N	1	-	-	-	-	-	-	1290	1135	1050	-	-	-	-	-	-
	2	-	-	-	-	-	-	1135	1050	910	-	-	-	-	-	-
	3	-	-	-	-	-	-	1135	1050	910	-	-	-	-	-	-
S	1	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
	2	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
	3	-	-	-	-	-	-	-	-	-	-	-	-	60	50	30
	4	-	-	-	-	-	-	-	-	-	-	-	-	85	60	40
H	1	-	-	-	-	-	-	-	-	-	170	140	115	145	110	85
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU35PM		
		P	1	545	475	445	355	310	295	445	385	360	280	245	230	310
	2	335	305	275	300	260	215	365	325	265	235	205	170	265	230	190
	3	305	275	245	275	235	190	340	290	235	215	185	150	240	205	170
	4	230	210	190	245	205	160	300	245	200	195	160	130	215	180	145
	5	310	275	250	205	185	160	245	230	200	160	140	130	180	160	145
	6	190	160	130	180	140	110	220	170	130	140	110	85	155	120	95
M	1	245	220	185	235	205	185	270	240	220	260	190	115	205	180	160
	2	220	190	170	210	180	150	245	215	175	230	170	105	185	155	130
	3	175	155	140	155	140	110	185	160	125	190	140	80	140	120	95
K	1	355	320	290	-	-	-	-	-	-	-	-	-	-	-	-
	2	280	250	230	-	-	-	-	-	-	-	-	-	-	-	-
	3	235	210	190	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	1075	945	945	-	-	-
	2	-	-	-	-	-	-	-	-	-	945	875	845	-	-	-
	3	-	-	-	-	-	-	-	-	-	875	760	760	-	-	-
S	1	-	-	-	50	40	35	55	50	35	62	45	27	40	35	30
	2	-	-	-	50	40	35	55	50	35	55	40	26	40	35	30
	3	-	-	-	60	50	35	65	55	35	64	46	29	55	40	30
	4	80	60	40	80	60	40	100	70	50	90	66	42	70	55	35
H	1	-	-	-	-	-	-	160	120	90	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M200 • RN.J10... • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 5,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,13	0,44	0,80	0,10	0,32	0,57	0,07	0,24	0,43	0,06	0,21	0,37	0,06	0,19	0,34	ML
MM	0,28	0,50	0,91	0,20	0,36	0,66	0,15	0,27	0,49	0,13	0,24	0,43	0,12	0,22	0,39	MM
MH	0,46	0,58	0,96	0,33	0,42	0,69	0,25	0,31	0,51	0,22	0,27	0,45	0,20	0,25	0,41	MH

At 2,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,15	0,51	0,92	0,11	0,37	0,66	0,08	0,27	0,49	0,07	0,24	0,43	0,07	0,22	0,39	ML
MM	0,32	0,58	1,06	0,23	0,42	0,76	0,18	0,31	0,57	0,15	0,27	0,49	0,14	0,25	0,45	MM
MH	0,54	0,67	1,11	0,39	0,48	0,80	0,29	0,36	0,59	0,25	0,32	0,52	0,23	0,29	0,47	MH

At 1,25 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,20	0,67	1,21	0,14	0,48	0,87	0,11	0,36	0,65	0,09	0,31	0,56	0,09	0,29	0,52	ML
MM	0,43	0,77	1,39	0,31	0,55	1,00	0,23	0,41	0,74	0,20	0,36	0,65	0,18	0,33	0,59	MM
MH	0,70	0,88	1,46	0,51	0,63	1,04	0,38	0,47	0,78	0,33	0,41	0,68	0,30	0,38	0,62	MH

At 0,63 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,27	0,92	1,67	0,20	0,66	1,19	0,15	0,49	0,89	0,13	0,43	0,77	0,12	0,39	0,71	ML
MM	0,58	1,05	1,92	0,42	0,75	1,37	0,31	0,56	1,02	0,27	0,49	0,88	0,25	0,45	0,81	MM
MH	0,96	1,21	2,02	0,69	0,87	1,43	0,52	0,65	1,06	0,45	0,56	0,93	0,41	0,52	0,85	MH

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

INDEXABLE MILLING

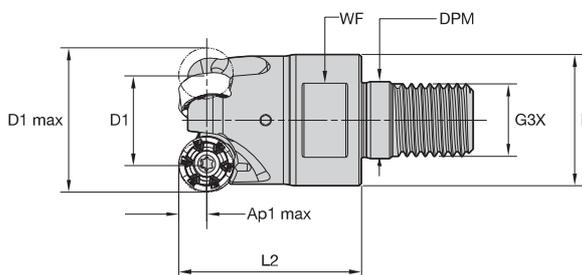
SOLID END MILLING

HOLEMAKING

TAPPING

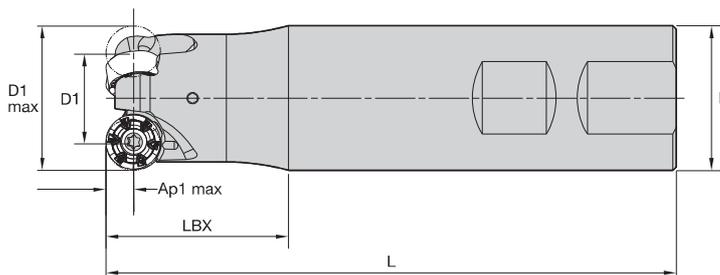
TURNING

M200 • RN.J12... • Screw-On End Mills • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147560	M200D32Z03M16RN12	32	20	29	17,0	M16	40	24	3,0	3	0.5	39160	Yes	0,18
4147561	M200D35Z03M16RN12	35	23	29	17,0	M16	40	24	3,0	3	0.4	37440	Yes	0,19
4147562	M200D42Z04M16RN12	42	30	29	17,0	M16	40	24	3,0	4	0.4	34180	Yes	0,23

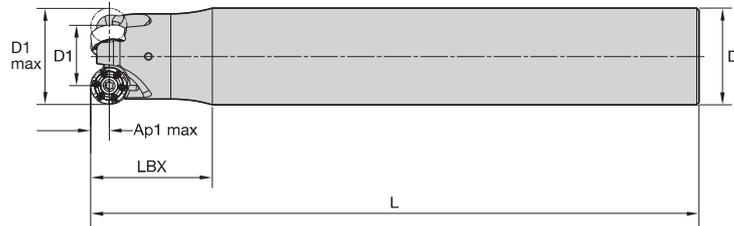
M200 • RN.J12... • Weldon® Shank • Metric



order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147564	M200D32Z03B32RN12	32	20	32	125	40	3,0	3	0.5	39160	Yes	0,65

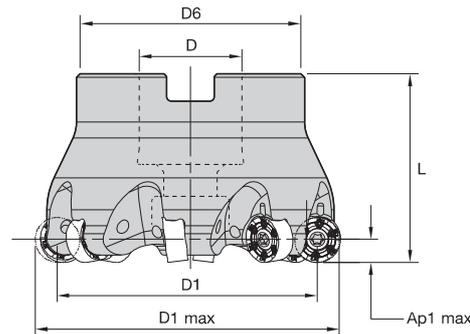
FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M200 • RN.J12... • Cylindrical Shank • Metric



order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147567	M200D32Z02A32RN12L250	32	20	32	250	40	3,0	2	0.4	39160	Yes	1,42
4147566	M200D32Z03A32RN12L200	32	20	32	200	40	3,0	3	0.5	39160	Yes	1,10

M200 • RN.J12... • Shell Mills • Metric



order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147568	M200D40Z04RN12	40	28	16	38	40	3,0	4	0.4	35020	Yes	0,22
4147569	M200D50Z04RN12	50	38	22	42	40	3,0	4	0.5	31330	Yes	0,29
4147570	M200D50Z05RN12	50	38	22	42	40	3,0	5	0.3	31330	Yes	0,29
4147571	M200D52Z05RN12	52	40	22	49	50	3,0	5	0.5	30720	Yes	0,50
4147572	M200D63Z05RN12	63	51	22	49	50	3,0	5	0.5	27910	Yes	0,63
4147573	M200D63Z07RN12	63	51	22	49	50	3,0	7	0.3	27910	Yes	0,63
4147574	M200D66Z07RN12	66	54	27	60	50	3,0	7	0.3	27260	Yes	0,82
4147575	M200D80Z06RN12	80	68	27	60	50	3,0	6	0.5	24760	Yes	1,02
4147576	M200D80Z08RN12	80	68	27	60	50	3,0	8	0.2	24760	Yes	1,02
4147577	M200D100Z07RN12	100	88	32	78	50	3,0	7	0.2	22150	Yes	1,45
4147578	M200D100Z09RN12	100	88	32	78	50	3,0	9	0.2	22150	Yes	1,41

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

INDEXABLE MILLING

SOLID END MILLING

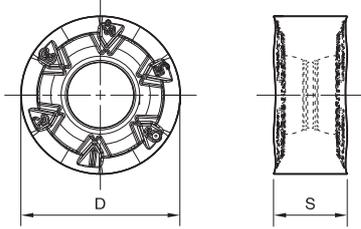
HOLEMAKING

TAPPING

TURNING

INDEXABLE MILLING

M200 • RN.J1204.. • RNGJ-ML



- first choice
- alternate choice

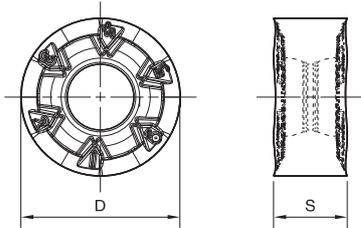
P	■	■	■	■	●	●	●	●	○	○	○	○
M	■	■	■	○	●	●	●	●	○	○	○	○
K	■	●	●	○	○	○	○	○	○	○	○	○
N	■	■	●	○	○	○	○	○	○	○	○	○
S	■	■	○	○	○	○	○	○	○	○	○	○
H	■	■	○	○	○	○	○	○	○	○	○	○

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0EML	2	12,00	4,75	0,04	■	■	■	■	●	○	○	○	○	○

SOLID END MILLING

HOLEMAKING

M200 • RN.J1204.. • RNGJ-MM



- first choice
- alternate choice

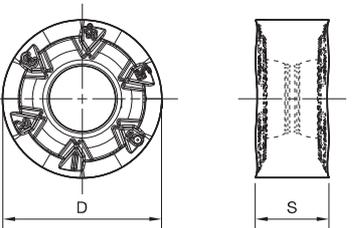
P	■	■	■	■	●	●	●	●	○	○	○	○
M	■	■	■	○	●	●	●	●	○	○	○	○
K	■	●	●	○	○	○	○	○	○	○	○	○
N	■	■	●	○	○	○	○	○	○	○	○	○
S	■	■	○	○	○	○	○	○	○	○	○	○
H	■	■	○	○	○	○	○	○	○	○	○	○

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0SMM	2	12,00	4,75	0,09	■	■	■	■	●	○	○	○	○	○

TAPPING

TURNING

M200 • RN.J1204.. • RNGJ-MH

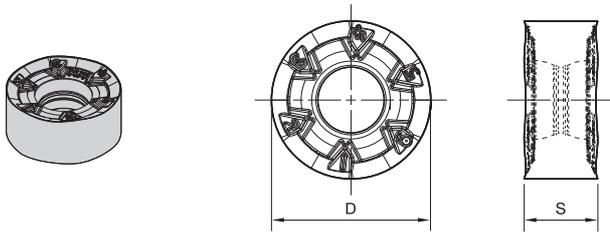


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0SMH	2	12,00	4,75	0,19	■	5123900	■	■	5123901	5123903	■	6408154	WS40PM	5123902

M200 • RN.J1204.. • RNPJ-MM

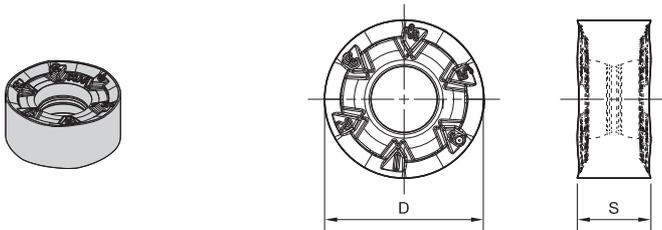


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1204M0SMM	2	12,00	4,75	0,09	■	■	■	■	●	●	○	○	○	○

M200 • RN.J1204.. • RNPJ-MH

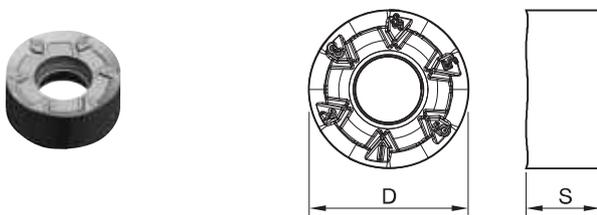


- first choice
- alternate choice

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

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1204M0SMH	12	12,00	4,75	0,18	●	■	■	■	●	●	○	○	○	○

M200 • RN.J1204.. • RNGJ-ALP



- first choice
- alternate choice

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

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0FALP	12	12,00	4,75	0,02	■	■	●	■	■	■	■	■	■	■

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M200 RN.J1204.. • 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	ALP	WN25PM	ALP	WN25PM	ALP	WN25PM
N3	ALP	WN25PM	ALP	WN25PM	ALP	WN25PM
S1-S2	ML	WS30PM	MM	WS30PM	MM	WU35PM
S3	ML	WS30PM	MM	WU35PM	MM	WU35PM
S4	ML	WS30PM	MM	WU35PM	MM	WU35PM
H1	MH	WP25PM	MH	WP20CM	-	-

M200 RN.J1204.. • Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
		P	1	-	-	-	-	-	-	-	-	-	660	580	540	395
P	2	-	-	-	-	-	-	-	-	-	410	370	330	330	290	240
P	3	-	-	-	-	-	-	-	-	-	370	330	305	305	260	210
P	4	-	-	-	-	-	-	-	-	-	275	260	230	270	220	180
P	5	-	-	-	-	-	-	-	-	-	330	300	275	220	205	180
P	6	-	-	-	-	-	-	-	-	-	230	205	175	200	150	120
M	1	-	-	-	-	-	-	-	-	-	270	240	210	245	215	200
M	2	-	-	-	-	-	-	-	-	-	245	210	190	220	190	155
M	3	-	-	-	-	-	-	-	-	-	190	175	150	170	145	115
K	1	505	460	410	400	290	215	-	-	-	430	390	355	275	245	220
K	2	400	355	330	350	235	170	-	-	-	340	305	280	215	190	180
K	3	335	300	275	280	245	165	-	-	-	290	260	240	180	160	145
N	1	-	-	-	-	-	-	1290	1135	1050	-	-	-	-	-	-
N	2	-	-	-	-	-	-	1135	1050	910	-	-	-	-	-	-
N	3	-	-	-	-	-	-	1135	1050	910	-	-	-	-	-	-
S	1	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
S	2	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
S	3	-	-	-	-	-	-	-	-	-	-	-	-	60	50	30
S	4	-	-	-	-	-	-	-	-	-	-	-	-	85	60	40
H	1	-	-	-	-	-	-	-	-	-	170	140	115	145	110	85
H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU35PM		
		P	1	545	475	445	355	310	295	445	385	360	280	245	230	310
P	2	335	305	275	300	260	215	365	325	265	235	205	170	265	230	190
P	3	305	275	245	275	235	190	340	290	235	215	185	150	240	205	170
P	4	230	210	190	245	205	160	300	245	200	195	160	130	215	180	145
P	5	310	275	250	205	185	160	245	230	200	160	140	130	180	160	145
P	6	190	160	130	180	140	110	220	170	130	140	110	85	155	120	95
M	1	245	220	185	235	205	185	270	240	220	260	190	115	205	180	160
M	2	220	190	170	210	180	150	245	215	175	230	170	105	185	155	130
M	3	175	155	140	155	140	110	185	160	125	190	140	80	140	120	95
K	1	355	320	290	-	-	-	-	-	-	-	-	-	-	-	-
K	2	280	250	230	-	-	-	-	-	-	-	-	-	-	-	-
K	3	235	210	190	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	1075	945	945	-	-	-
N	2	-	-	-	-	-	-	-	-	-	945	875	845	-	-	-
N	3	-	-	-	-	-	-	-	-	-	875	760	760	-	-	-
S	1	-	-	-	50	40	35	55	50	35	62	45	27	40	35	30
S	2	-	-	-	50	40	35	55	50	35	55	40	26	40	35	30
S	3	-	-	-	60	50	35	65	55	35	64	46	29	55	40	30
S	4	80	60	40	80	60	40	100	70	50	90	66	42	70	55	35
H	1	-	-	-	-	-	-	160	120	90	-	-	-	-	-	-
H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M200 RN.J1204.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 6,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,12	0,18	0,32	0,09	0,13	0,23	0,07	0,10	0,18	0,06	0,08	0,15	0,05	0,08	0,14	ML
MM	0,28	0,51	0,84	0,21	0,37	0,61	0,15	0,28	0,45	0,13	0,24	0,39	0,12	0,22	0,36	MM
MH	0,46	0,70	1,02	0,33	0,50	0,73	0,25	0,38	0,55	0,22	0,33	0,48	0,20	0,30	0,44	MH

At 3,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,14	0,20	0,37	0,10	0,15	0,27	0,08	0,11	0,20	0,07	0,10	0,18	0,06	0,09	0,16	ML
MM	0,33	0,59	0,97	0,24	0,43	0,70	0,18	0,32	0,52	0,16	0,28	0,45	0,14	0,25	0,42	MM
MH	0,54	0,81	1,18	0,39	0,58	0,85	0,29	0,43	0,63	0,25	0,38	0,55	0,23	0,35	0,51	MH

At 1,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,18	0,27	0,49	0,13	0,19	0,35	0,10	0,15	0,26	0,09	0,13	0,23	0,08	0,12	0,21	ML
MM	0,43	0,77	1,28	0,31	0,56	0,92	0,23	0,42	0,68	0,20	0,36	0,60	0,19	0,33	0,55	MM
MH	0,70	1,06	1,56	0,51	0,76	1,12	0,38	0,57	0,83	0,33	0,50	0,72	0,30	0,45	0,66	MH

At 0,75 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,25	0,37	0,67	0,18	0,27	0,48	0,14	0,20	0,36	0,12	0,17	0,32	0,11	0,16	0,29	ML
MM	0,59	1,06	1,77	0,43	0,76	1,26	0,32	0,57	0,94	0,28	0,50	0,81	0,25	0,45	0,75	MM
MH	0,96	1,46	2,16	0,69	1,04	1,53	0,52	0,78	1,14	0,45	0,68	0,99	0,41	0,62	0,90	MH

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

INDEXABLE MILLING

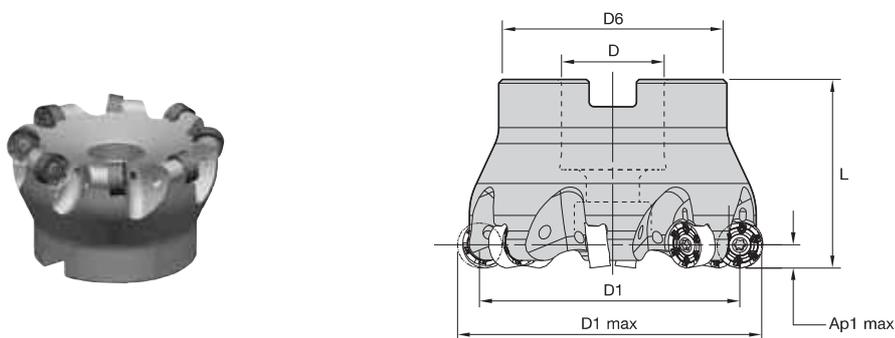
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M200 • RN.J16... • Shell Mills • Metric



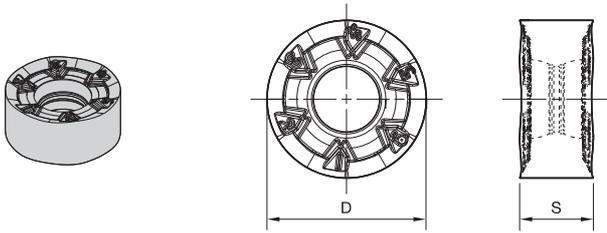
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5209989	M200D50Z04RN16	50	34	22	42	50	4,0	4	0.5	26700	Yes	0,36
5210210	M200D52Z04RN16	52	36	22	42	50	4,0	4	0.4	26000	Yes	0,39
5210211	M200D63Z04RN16	63	47	22	49	50	4,0	4	0.4	22700	Yes	0,58
5210212	M200D63Z06RN16	63	47	22	49	50	4,0	6	0.4	22700	Yes	0,56
5210213	M200D66Z05RN16	66	50	27	60	50	4,0	5	0.4	22000	Yes	0,69
5210214	M200D80Z05RN16	80	64	27	60	50	4,0	5	0.3	19500	Yes	0,88
5210215	M200D80Z07RN16	80	64	27	60	50	4,0	7	0.3	19500	Yes	0,89
5210216	M200D100Z06RN16	100	84	32	78	50	4,0	6	0.3	17000	Yes	1,36
5210217	M200D100Z08RN16	100	84	32	78	50	4,0	8	0.3	17000	Yes	1,37
5210218	M200D125Z08RN16	125	109	40	90	63	4,0	8	0.2	14900	Yes	2,50

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M200 • RN.J1605.. • RNGJ-ML

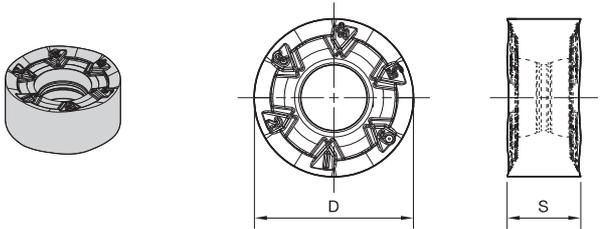


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm		WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1605M0EML	2	16,00	5,52	0,04		■	■	■	■	5274561	■	■	5520354	6408155	■

M200 • RN.J1605.. • RNPJ-MM



- first choice
- alternate choice

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

catalogue number	cutting edges	D	S	hm		WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1605M0SMM	12	16,00	5,52	0,09		■	■	■	5276472	5276471	5276470	5542341	■	6408156	5476637

INDEXABLE MILLING

SOLID END MILLING

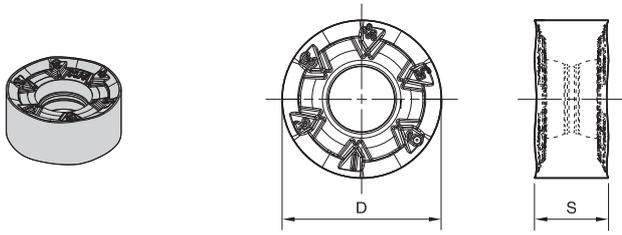
HOLEMAKING

TAPPING

TURNING

INDEXABLE MILLING

M200 • RN.J1605.. • RNPJ-MH



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	5276476	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNPJ1605M0SMH	2	16,00	5,52	0,23	■	■	■	■	■	■	■	■	■	■	■

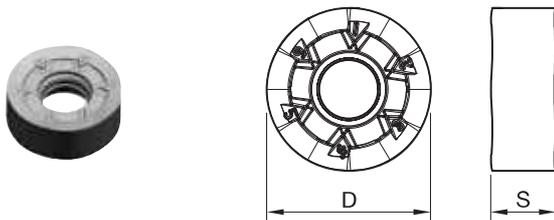
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M200 • RN.J1605.. • RNGJ-ALP



- first choice
- alternate choice

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

catalogue number	cutting edges	D	S	hm	WK15CM	WK15PM	WN25PM	WP20CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
RNGJ1605M0FALP	12	16,00	5,52	0,02	■	■	6065662	■	■	■	■	■	■	■

M200 • RN.J1605.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	ML	WP25PM	MM	WP40PM	MM	WP40PM
P3-P4	ML	WP25PM	MM	WP25PM	MH	WP40PM
P5-P6	ML	WP35CM	MM	WP35CM	MH	WP35CM
M1-M2	ML	WP25PM	ML	WU35PM	MM	WU35PM
M3	ML	WP25PM	MM	WU35PM	MM	WU35PM
K1-K2	MH	WK15CM	MH	WK15CM	MH	WP20CM
K3	MH	WK15CM	MH	WP20CM	MH	WP35CM
N1-N2	ALP	WN25PM	ALP	WN25PM	ALP	WN25PM
N3	ALP	WN25PM	ALP	WN25PM	ALP	WN25PM
S1-S2	ML	WS30PM	ML	WS30PM	ML	WU35PM
S3	ML	WS30PM	ML	WU35PM	ML	WU35PM
S4	ML	WS30PM	ML	WU35PM	ML	WU35PM
H1	MH	WP25PM	MH	WP20CM	-	-

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M200 • RN.J1605.. • Recommended Starting Speeds [m/min]

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
P	1	-	-	-	-	-	-	-	-	-	660	580	540	395	340	325
	2	-	-	-	-	-	-	-	-	-	410	370	330	330	290	240
	3	-	-	-	-	-	-	-	-	-	370	330	305	305	260	210
	4	-	-	-	-	-	-	-	-	-	275	260	230	270	220	180
	5	-	-	-	-	-	-	-	-	-	330	300	275	220	205	180
	6	-	-	-	-	-	-	-	-	-	230	205	175	200	150	120
M	1	-	-	-	-	-	-	-	-	-	270	240	210	245	215	200
	2	-	-	-	-	-	-	-	-	-	245	210	190	220	190	155
	3	-	-	-	-	-	-	-	-	-	190	175	150	170	145	115
K	1	505	460	410	400	290	215	-	-	-	430	390	355	275	245	220
	2	400	355	330	350	235	170	-	-	-	340	305	280	215	190	180
	3	335	300	275	280	245	165	-	-	-	290	260	240	180	160	145
N	1	-	-	-	-	-	-	1290	1135	1050	-	-	-	-	-	-
	2	-	-	-	-	-	-	1135	1050	910	-	-	-	-	-	-
	3	-	-	-	-	-	-	1135	1050	910	-	-	-	-	-	-
S	1	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
	2	-	-	-	-	-	-	-	-	-	-	-	-	50	40	30
	3	-	-	-	-	-	-	-	-	-	-	-	-	60	50	30
	4	-	-	-	-	-	-	-	-	-	-	-	-	85	60	40
H	1	-	-	-	-	-	-	-	-	-	170	140	115	145	110	85
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Group		WP35CM			WP40PM			WS30PM			WS40PM			WU35PM		
P	1	545	475	445	355	310	295	445	385	360	280	245	230	310	275	260
	2	335	305	275	300	260	215	365	325	265	235	205	170	265	230	190
	3	305	275	245	275	235	190	340	290	235	215	185	150	240	205	170
	4	230	210	190	245	205	160	300	245	200	195	160	130	215	180	145
	5	310	275	250	205	185	160	245	230	200	160	140	130	180	160	145
	6	190	160	130	180	140	110	220	170	130	140	110	85	155	120	95
M	1	245	220	185	235	205	185	270	240	220	260	190	115	205	180	160
	2	220	190	170	210	180	150	245	215	175	230	170	105	185	155	130
	3	175	155	140	155	140	110	185	160	125	190	140	80	140	120	95
K	1	355	320	290	-	-	-	-	-	-	-	-	-	-	-	-
	2	280	250	230	-	-	-	-	-	-	-	-	-	-	-	-
	3	235	210	190	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	1075	945	945	-	-	-
	2	-	-	-	-	-	-	-	-	-	945	875	845	-	-	-
	3	-	-	-	-	-	-	-	-	-	875	760	760	-	-	-
S	1	-	-	-	50	40	35	55	50	35	62	45	27	40	35	30
	2	-	-	-	50	40	35	55	50	35	55	40	26	40	35	30
	3	-	-	-	60	50	35	65	55	35	64	46	29	55	40	30
	4	80	60	40	80	60	40	100	70	50	90	66	42	70	55	35
H	1	-	-	-	-	-	-	160	120	90	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M200 • RN.J1605.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,12	0,37	0,48	0,09	0,27	0,35	0,07	0,20	0,26	0,06	0,17	0,23	0,05	0,16	0,21	ML
MM	0,28	0,70	0,81	0,21	0,50	0,58	0,15	0,38	0,44	0,13	0,33	0,38	0,12	0,30	0,35	MM
MH	0,53	0,70	1,17	0,38	0,50	0,84	0,29	0,38	0,63	0,25	0,33	0,55	0,23	0,30	0,50	MH

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,14	0,43	0,56	0,10	0,31	0,40	0,08	0,23	0,30	0,07	0,20	0,26	0,06	0,18	0,24	ML
MM	0,33	0,81	0,94	0,24	0,58	0,67	0,18	0,43	0,50	0,16	0,38	0,44	0,14	0,35	0,40	MM
MH	0,62	0,81	1,36	0,44	0,58	0,97	0,33	0,43	0,72	0,29	0,38	0,63	0,27	0,35	0,58	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,19	0,56	0,73	0,14	0,40	0,53	0,10	0,30	0,40	0,09	0,26	0,34	0,08	0,24	0,32	ML
MM	0,43	1,06	1,24	0,31	0,76	0,89	0,23	0,57	0,66	0,20	0,50	0,57	0,19	0,45	0,53	MM
MH	0,81	1,06	1,79	0,58	0,76	1,28	0,44	0,57	0,95	0,38	0,50	0,83	0,35	0,45	0,76	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
ALP	0,12	0,20	0,28	0,08	0,15	0,20	0,06	0,11	0,15	0,06	0,09	0,13	0,05	0,09	0,12	ALP
ML	0,26	0,77	1,01	0,19	0,55	0,73	0,14	0,41	0,54	0,12	0,36	0,47	0,11	0,33	0,43	ML
MM	0,59	1,46	1,70	0,43	1,04	1,21	0,32	0,78	0,90	0,28	0,68	0,79	0,25	0,62	0,72	MM
MH	1,11	1,46	2,48	0,80	1,04	1,75	0,60	0,78	1,30	0,52	0,68	1,13	0,48	0,62	1,03	MH

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M170™ Series

M170 IC07, M170 IC10, M170 IC12, M170 IC16 Copy Mills

Use the M170 for hard machining in die and mold manufacturing while maintaining long tool life and smooth chip flow.

Nickel-coated cutter bodies improve tool life and chip flow.

High tooth density for high-speed machining (HSM).

Strong PSTS inserts provide ramping and helical interpolation capabilities.



The M170 is equipped with a hard nickel-coated body and tough PSTS inserts to enhance performance in die and mold manufacturing.

INSERT OFFERING



iC07
7mm iC insert RD.X
Up to 3,5mm Ap max.
Diameter range
12–35mm.



iC10
10mm iC insert RDPX
Up to 5mm Ap max.
Diameter range
20–52mm.



iC12
12mm iC insert RDPX
Up to 6mm Ap max.
Diameter range
24–100mm.



iC16
16mm iC insert RDPX
Up to 8mm Ap max.
Diameter range
32–125mm.

MAXIMIZE PERFORMANCE WITH M170

PRODUCT

SERIES

M170™

DIAMETER RANGE

12–125mm

SHANK TYPES

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

INDUSTRY



APPLICATIONS



3D PROFILING



FACE MILLING



HELICAL MILLING



POCKETING



RAMPING BLANK



SIDE MILLING/
SHOULDER
MILLING: BALL NOSE



SLOTTING:
BALL NOSE

STRONG AND DURABLE

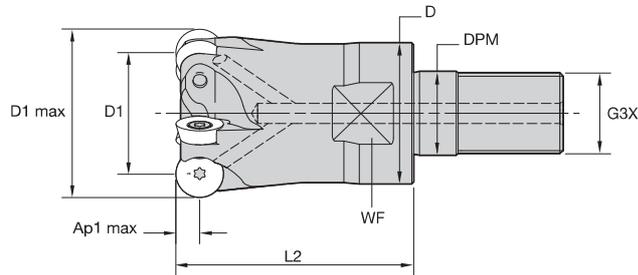
The nickel-coated tool body and sturdy PSTS inserts ensure longer tool life.

DIE AND MOLD

Designed and suited for hard machining in die and mold manufacturing.



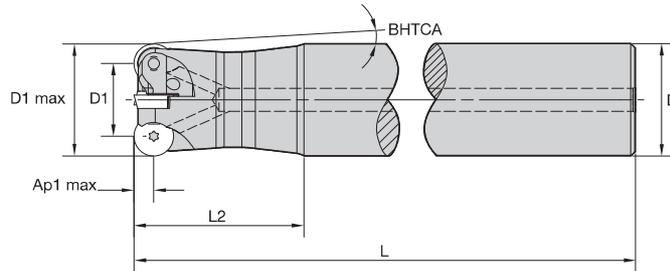
M170 • Screw-On RD07T1.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3935337	M170D012Z02M08RD07T	12	5	13	8,5	M8	23	10	3,5	2	22.0	26200	Yes	0,02

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

M170 • Cylindrical Shank RD07T1.. • Metric

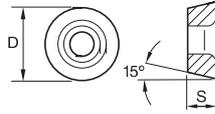
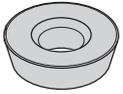


order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3935339	M170D012Z02A12RD07TL100	12	5	12	100	20	—	3,5	2	22.0	26200	Yes	0,07
3935340	M170D012Z02A16RD07TL120	12	5	16	120	60	2.0	3,5	2	22.0	26200	Yes	0,14
3935341	M170D012Z02A16RD07TL140	12	5	16	140	80	1.5	3,5	2	22.0	26200	Yes	0,16

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M170 • RDHX-MH • RD07T1..



- first choice
- alternate choice

P	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

catalogue number	D	S	hm		
RDHX07T1M0SNMH	7,00	1,98	0,08	TN2505	TN6525
				3960578	3960573
					TN6540

INDEXABLE MILLING

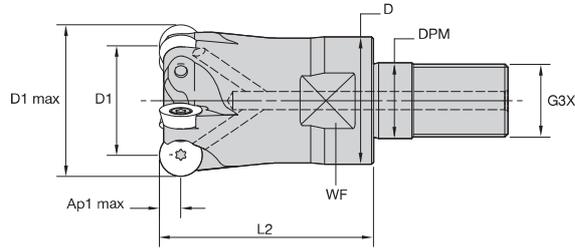
SOLID END MILLING

HOLE/MAKING

TAPPING

TURNING

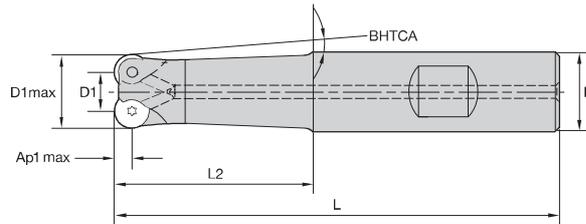
M170 • Screw-On RD0702.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926607	M170D015Z02M08RD07	15	8	13	8,5	M8	23	10	3,5	2	18.0	21200	Yes	0,03
3926608	M170D016Z03M08RD07	16	9	13	8,5	M8	23	10	3,5	3	9.0	21200	Yes	0,03
3926609	M170D020Z04M10RD07	20	13	18	10,5	M10	30	14	3,5	4	12.5	19600	Yes	0,06
3926610	M170D025Z05M12RD07	25	18	21	12,5	M12	35	19	3,5	5	8.5	12700	Yes	0,10

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

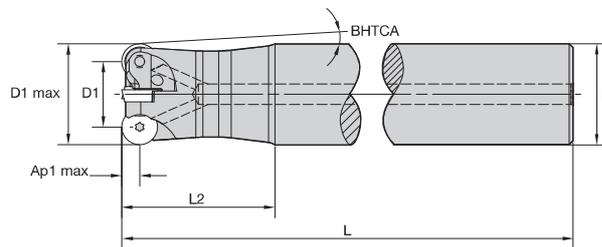
M170 • Weldon® Shank RD0702.. • Metric



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

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

M170 • Cylindrical Shank RD0702.. • Metric

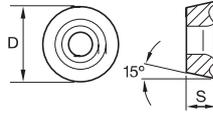
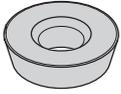


order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3929404	M170D015Z02A16RD07L110	15	8	16	110	60	0.5	3,5	2	18.0	21200	Yes	0,14
3929405	M170D015Z02A16RD07L150	15	8	16	150	60	0.5	3,5	2	18.0	21200	Yes	0,20
3929407	M170D016Z02A16RD07L150	16	9	16	150	30	—	3,5	2	9.0	21200	Yes	0,21
3929406	M170D016Z03A16RD07L110	16	9	16	110	20	—	3,5	3	9.0	21200	Yes	0,16
3929409	M170D020Z03A20RD07L140	20	13	20	140	40	—	3,5	3	12.0	10600	Yes	0,29
3929408	M170D020Z04A20RD07L115	20	13	20	115	30	—	3,5	4	12.0	10600	Yes	0,25

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M170 • RDPX-MH • RD0702..



- first choice
- alternate choice

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

catalogue number	D	S	hm			
RDPX0702M0SNMH	7,00	2,38	0,08	TN2505	TN6525	TN6540
				3959627	3959626	3959625

M170 • RD07.. • 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	-	-

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M170 • RD07.. • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540		
P	1	550	420	360	410	320	280	360	280	240
	2	320	240	205	320	250	215	250	190	170
	3	320	240	205	280	215	185	215	170	140
	4	-	-	-	235	170	145	180	130	110
	5	-	-	-	310	235	200	240	180	150
	6	-	-	-	205	160	130	160	120	100
M	1	-	-	-	190	120	80	130	80	60
	2	-	-	-	120	80	50	80	50	40
	3	-	-	-	125	80	55	85	50	40
K	1	400	300	250	275	245	220	220	205	180
	2	540	365	280	215	190	180	175	155	140
	3	310	190	155	180	160	145	155	145	125
N	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30
	2	-	-	-	-	-	-	25	20	10
	3	-	-	-	-	-	-	70	40	30
	4	-	-	-	-	-	-	60	30	25
H	1	175	140	95	-	-	-	-	-	-
	2	175	140	95	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-

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

M170 • RD07.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 3,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MH	0,23	0,46	0,74	0,17	0,33	0,54	0,13	0,25	0,40	0,11	0,22	0,35	0,10	0,20	0,32	MH

At 1,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MH	0,28	0,56	0,91	0,20	0,41	0,65	0,15	0,31	0,49	0,13	0,27	0,43	0,12	0,24	0,39	MH

At 0,75mm Axial Depth of Cut (ap)

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

At 0,50mm Axial Depth of Cut (ap)

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

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

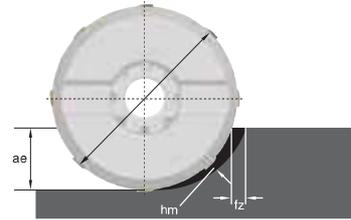
TURNING

WIDIA™ Indexable Milling Additional Application Advice RD07.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

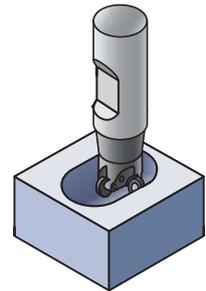
With round inserts, two factors can affect the hm: Ap1 and ae. fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 0,5mm	0,59mm	0,42mm	0,34mm	0,30mm	0,26mm	0,19mm
Ap1 = 0,75mm	0,50mm	0,36mm	0,29mm	0,25mm	0,22mm	0,16mm
Ap1 = 1mm	0,42mm	0,30mm	0,24mm	0,21mm	0,19mm	0,13mm
Ap1 = 1,5mm	0,34mm	0,24mm	0,20mm	0,17mm	0,15mm	0,11mm
Ap1 = 3,5mm	0,22mm	0,16mm	0,13mm	0,11mm	0,10mm	0,08mm

Example application highlighted.



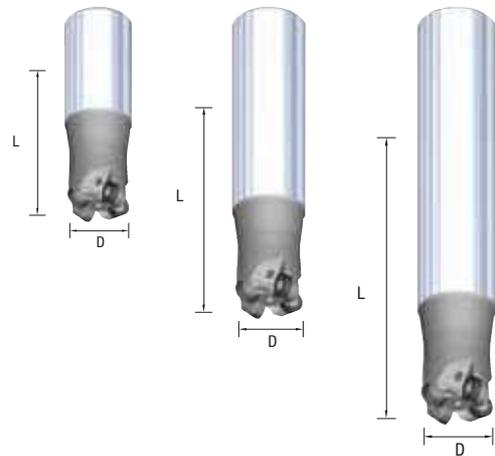
Example Cutting Conditions for RD..07... Insert in Pocketing, L/D ratio = 2 x D:

insert = RDPX0702M0SNMH		TN2505			TN6525			TN6540			
		feed per tooth fz (mm)/ae>50%									
		min	med	max	min	med	max	min	med	max	
ae>50%	Recommended starting Ap1 = 0,5mm		0,19mm	0,22mm	0,30mm	0,19mm	0,30mm	0,35mm	0,19mm	0,30mm	0,40mm

2. Ap1 and vc corrections depend on L/D ratio

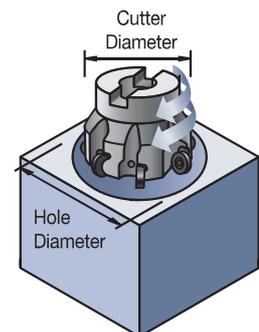
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

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

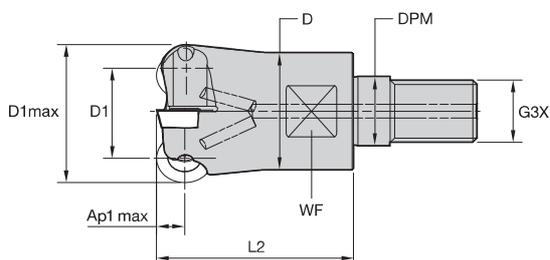


Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
12	17mm	17mm	3,5mm	22°	1mm
15	18mm	23mm	2,8mm	18°	2,2mm
16	20mm	25mm	1,9mm	9°	1,4mm
20	28mm	33mm	3,5mm	12°	1,5mm
25	36,5mm	43mm	3,5mm	8,5°	2,5mm
30	46,4mm	53mm	3,5mm	6,5°	2,5mm



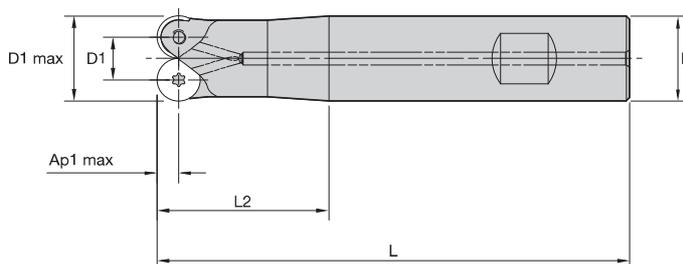
M170 • Screw-On RD1003.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3934647	M170D020Z02M10RD10	20	10	18	10,5	M10	30	15	5,0	2	20.0	15900	Yes	0,06
3934649	M170D025Z03M12RD10	25	15	21	12,5	M12	35	19	5,0	3	8.0	12800	Yes	0,10
3934650	M170D030Z04M16RD10	30	20	29	17,0	M16	43	22	5,0	4	10.0	10600	Yes	0,24
3934652	M170D042Z06M16RD10	42	32	29	17,0	M16	45	22	5,0	6	6.0	7800	Yes	0,28

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

M170 • Weldon® Shank RD1003.. • Metric



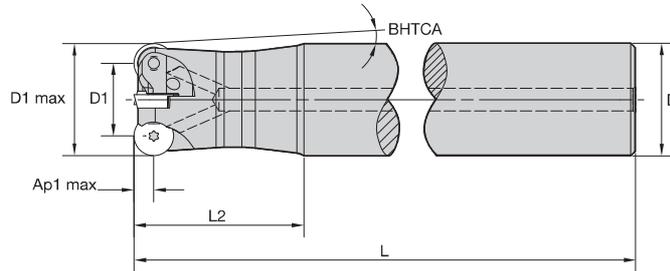
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940703	M170D020Z02B20RD10	20	10	20	110	40	5,0	2	20.0	15900	Yes	0,24
3940708	M170D025Z03B25RD10	25	15	25	110	40	5,0	3	9.0	12900	Yes	0,35

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

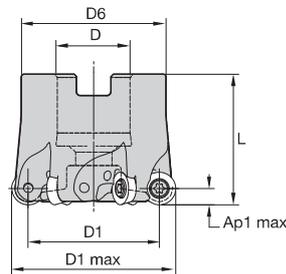
M170 • Cylindrical Shank RD1003.. • Metric



order number	catalogue number	D1 max	D1	D	L	L2	BHTCA	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940704	M170D020Z02A20RD10L140	20	10	20	140	60	—	5,0	2	20,0	15900	Yes	0,30
3940705	M170D020Z02A25RD10L160	20	10	25	160	80	2,0	5,0	2	20,0	15900	Yes	0,48
3940706	M170D020Z02A25RD10L180	20	10	25	180	100	1,5	5,0	2	20,0	15900	Yes	0,53
3940707	M170D022Z02A20RD10L160	22	12	20	160	40	—	5,0	2	12,0	14400	Yes	0,35
3940709	M170D025Z02A25RD10L180	25	15	25	180	70	—	5,0	2	9,0	12800	Yes	0,61
3940710	M170D025Z02A25RD10L220	25	15	25	220	100	—	5,0	2	9,0	12800	Yes	0,74

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

M170 • Shell Mills RD1003.. • Metric

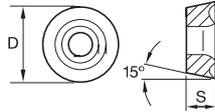
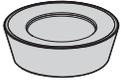


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3940712	M170D040Z05RD10	40	30	16	37	40	5,0	5	7,2	9950	Yes	0,28
3940723	M170D042Z05RD10	42	32	16	37	40	5,0	5	5,8	9500	Yes	0,28
3940724	M170D050Z06RD10	50	40	22	44	40	5,0	6	5,2	7950	Yes	0,35
3940725	M170D052Z06RD10	52	42	22	44	50	5,0	6	3,0	7650	Yes	0,51

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

INDEXABLE MILLING

M170 • RDPX-MM • RD1003..



- first choice
- alternate choice

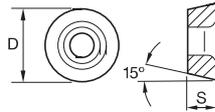
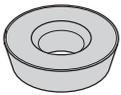
P	●	○	○	○	○
M	●	○	○	○	○
K	●	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

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

SOLID END MILLING

HOLE/REAMING

M170 • RDPX-MH • RD1003..



- first choice
- alternate choice

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

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

TAPPING

TURNING

M170 • RD1003.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	MM	TN6525	MM	TN6525	MM	TN6540
P3-P4	MH	TN2505	MH	TN6525	MH	TN6540
P5-P6	MH	TN2505	MH	TN6525	MH	TN6540
M1-M2	-	-	MM	TN6525	MM	TN6540
M3	-	-	MM	TN6525	MM	TN6540
K1-K2	MH	TN2505	MH	TN2505	MH	TN6525
K3	MH	TN2505	MH	TN2505	MH	TN6525
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	MM	TN6540	-	-
S3	-	-	MM	TN6540	-	-
S4	-	-	MM	TN6540	-	-
H1	MH	TN2505	MH	TN2505	-	-

M170 • RD1003.. • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540		
P	1	550	420	360	410	320	280	360	280	240
	2	320	240	205	320	250	215	250	190	170
	3	320	240	205	280	215	185	215	170	140
	4	-	-	-	235	170	145	180	130	110
	5	-	-	-	310	235	200	240	180	150
	6	-	-	-	205	160	130	160	120	100
M	1	-	-	-	190	120	80	130	80	60
	2	-	-	-	120	80	50	80	50	40
	3	-	-	-	125	80	55	85	50	40
K	1	400	300	250	275	245	220	220	205	180
	2	540	365	280	215	190	180	175	155	140
	3	310	190	155	180	160	145	155	145	125
N	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30
	2	-	-	-	-	-	-	25	20	10
	3	-	-	-	-	-	-	70	40	30
	4	-	-	-	-	-	-	60	30	25
H	1	175	140	95	-	-	-	-	-	-
	2	175	140	95	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-

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

M170 • RD1003.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,28	0,41	0,74	0,20	0,29	0,53	0,15	0,22	0,4	0,13	0,19	0,35	0,12	0,18	0,32	MM
MH	0,33	0,58	0,98	0,24	0,42	0,71	0,18	0,32	0,53	0,16	0,28	0,46	0,14	0,25	0,42	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,35	0,51	0,93	0,25	0,37	0,67	0,19	0,28	0,50	0,17	0,24	0,44	0,15	0,22	0,40	MM
MH	0,42	0,73	1,23	0,30	0,53	0,88	0,23	0,39	0,66	0,20	0,34	0,57	0,18	0,32	0,53	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,47	0,68	1,25	0,34	0,49	0,89	0,25	0,37	0,67	0,22	0,32	0,58	0,20	0,29	0,53	MM
MH	0,56	0,98	1,66	0,40	0,71	1,18	0,30	0,53	0,88	0,26	0,46	0,76	0,24	0,42	0,70	MH

At 0,50mm Axial Depth of Cut (ap)

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

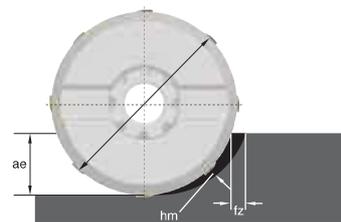
NOTE: Use "Light Machining" value as starting feed rate.

WIDIA™ Indexable Milling Additional Application Advice RD1003.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

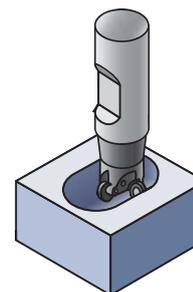
With round inserts, two factors can affect the hm: Ap1 and ae. fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 0,5mm	1,18mm	0,70mm	0,63mm	0,56mm	0,50mm	0,35mm
Ap1 = 0,75mm	0,95mm	0,62mm	0,56mm	0,50mm	0,45mm	0,30mm
Ap1 = 1mm	0,80mm	0,57mm	0,46mm	0,40mm	0,36mm	0,25mm
Ap1 = 2mm	0,57mm	0,40mm	0,33mm	0,28mm	0,25mm	0,18mm
Ap1 = 3mm	0,46mm	0,33mm	0,27mm	0,23mm	0,21mm	0,15mm
Ap1 = 5mm	0,36mm	0,25mm	0,21mm	0,18mm	0,16mm	0,11mm

Example application highlighted.



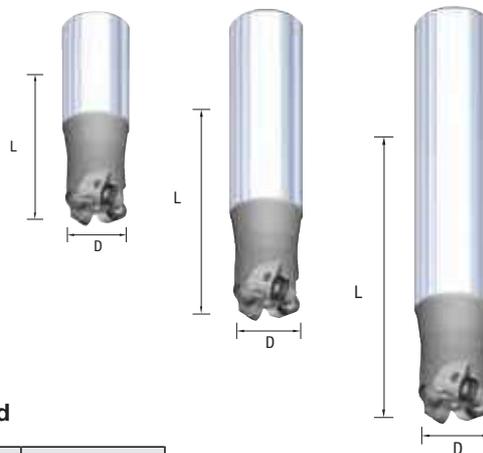
Example Cutting Conditions for RD..10... Insert in Pocketing, L/D ratio = 2 x D:

insert = RDPX1003M0SN			TN2505			TN6525			TN6540		
			feed per tooth fz (mm)/ae>50%								
			min	med	max	min	med	max	min	med	max
Edge Geometry MM	ae>50%	Recommended starting Ap1 = 1mm	-	-	-	0,25mm	0,30mm	0,40mm	0,25mm	0,32mm	0,45mm
Edge Geometry MH	ae>50%	Recommended starting Ap1 = 1mm	0,25mm	0,32mm	0,40mm	0,25mm	0,35mm	0,55mm	0,25mm	0,45mm	0,65mm

2. Ap1 and vc corrections depend on L/D ratio

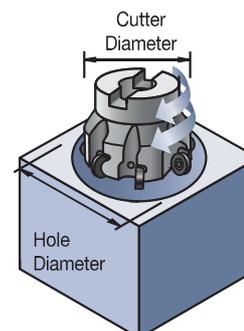
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

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

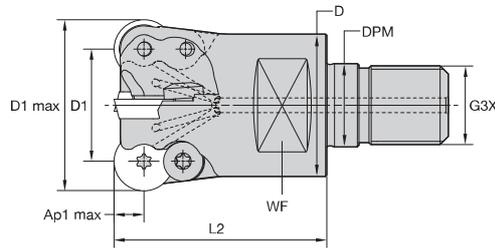


Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
20	22mm	30mm	2,1mm	20°	4mm
22	24mm	34mm	2,1mm	20°	2,4mm
25	33mm	40mm	3,2mm	8°	1,7mm
28	36mm	46mm	5mm	15°	3,8mm
30	40,6mm	50mm	5mm	10°	3,4mm
35	50,7mm	60mm	5mm	8,5°	3,4mm
40	60,5mm	70mm	5mm	7,2°	3,6mm
42	64,5mm	74mm	5mm	5,8°	3,6mm
50	80,3mm	90mm	5mm	5,2°	4mm
52	85,8mm	94mm	5mm	3°	2,2mm



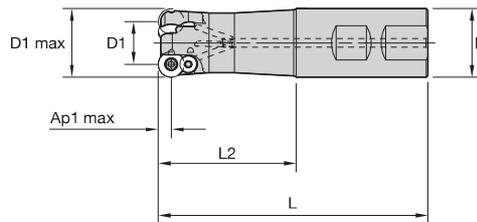
M170 • Screw-On RD12T3.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930954	M170D035Z03M16RD12	35	23	29	17,0	M16	43	22	6,0	3	11,0	9900	Yes	0,22
3930956	M170D035Z04M16RD12	35	23	29	17,0	M16	43	22	6,0	4	10,5	9900	Yes	0,21

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

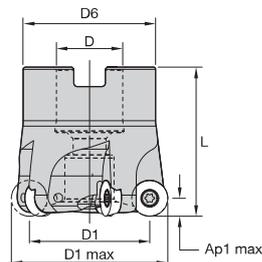
M170 • Weldon® Shank RD12T3.. • Metric



order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930960	M170D032Z03B32RD12	32	20	32	125	64	6,0	3	12,0	9500	Yes	0,63

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

M170 • Shell Mills RD12T3.. • Metric

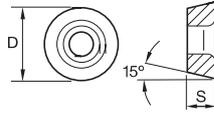
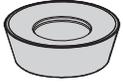


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3930968	M170D040Z04RD12	40	28	16	37	40	6,0	4	9,3	7000	Yes	0,22
3930970	M170D050Z05RD12	50	38	22	44	40	6,0	5	6,1	7950	Yes	0,32
3930972	M170D052Z05RD12	52	40	22	44	50	6,0	5	4,5	7600	Yes	0,44
3930975	M170D063Z06RD12	63	51	22	44	40	6,0	6	4,5	6300	Yes	0,45
3930976	M170D066Z06RD12	66	54	27	60	50	6,0	6	4,5	6030	Yes	0,81
3930979	M170D080Z07RD12	80	68	27	60	50	6,0	7	3,5	4900	Yes	0,97
3930981	M170D100Z08RD12	100	88	32	80	55	6,0	8	2,2	3900	Yes	1,95

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M170 • RDPX-MM • RD12T3..

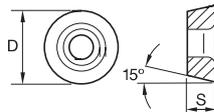
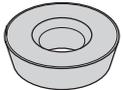


- first choice
- alternate choice

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

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX12T3M0SNMM	12,00	3,97	0,13	●	○	○

M170 • RDPX-MH • RD12T3..



- first choice
- alternate choice

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

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX12T3M0SNMH	12,00	3,97	0,17	○	○	●

M170 • RD12T3.. • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	MM	TN6525	MM	TN6525	MM	TN6540
P3-P4	MH	TN2505	MH	TN6525	MH	TN6540
P5-P6	MH	TN2505	MH	TN6525	MH	TN6540
M1-M2	-	-	MM	TN6525	MM	TN6540
M3	-	-	MM	TN6525	MM	TN6540
K1-K2	MH	TN2505	MH	TN2505	MH	TN6525
K3	MH	TN2505	MH	TN2505	MH	TN6525
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	MM	TN6540	-	-
S3	-	-	MM	TN6540	-	-
S4	-	-	MM	TN6540	-	-
H1	MH	TN2505	MH	TN2505	-	-

M170 • RD12T3.. • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540		
P	1	550	420	360	410	320	280	360	280	240
	2	320	240	205	320	250	215	250	190	170
	3	320	240	205	280	215	185	215	170	140
	4	-	-	-	235	170	145	180	130	110
	5	-	-	-	310	235	200	240	180	150
	6	-	-	-	205	160	130	160	120	100
M	1	-	-	-	190	120	80	130	80	60
	2	-	-	-	120	80	50	80	50	40
	3	-	-	-	125	80	55	85	50	40
K	1	400	300	250	275	245	220	220	205	180
	2	540	365	280	215	190	180	175	155	140
	3	310	190	155	180	160	145	155	145	125
N	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30
	2	-	-	-	-	-	-	25	20	10
	3	-	-	-	-	-	-	70	40	30
	4	-	-	-	-	-	-	60	30	25
H	1	175	140	95	-	-	-	-	-	-
	2	175	140	95	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-

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

M170 • RD12T3.. • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 6,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,33	0,48	0,76	0,24	0,35	0,54	0,18	0,26	0,41	0,16	0,23	0,35	0,14	0,21	0,33	MM
MH	0,35	0,70	1,17	0,25	0,50	0,84	0,19	0,38	0,63	0,16	0,33	0,55	0,15	0,30	0,50	MH

At 3,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,38	0,56	0,88	0,28	0,40	0,63	0,21	0,30	0,47	0,18	0,26	0,41	0,17	0,24	0,38	MM
MH	0,40	0,81	1,36	0,29	0,58	0,97	0,22	0,43	0,72	0,19	0,38	0,63	0,17	0,35	0,58	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,44	0,65	1,02	0,32	0,47	0,73	0,24	0,35	0,55	0,21	0,30	0,48	0,19	0,28	0,44	MM
MH	0,47	0,94	1,59	0,34	0,68	1,13	0,25	0,50	0,84	0,22	0,44	0,73	0,20	0,40	0,67	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,60	0,88	1,38	0,43	0,63	0,99	0,32	0,47	0,74	0,28	0,41	0,64	0,26	0,38	0,59	MM
MH	0,63	1,28	2,16	0,45	0,91	1,53	0,34	0,68	1,14	0,30	0,59	0,99	0,27	0,54	0,90	MH

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

WIDIA™ Indexable Milling Additional Application Advice RD12T3.. • M170

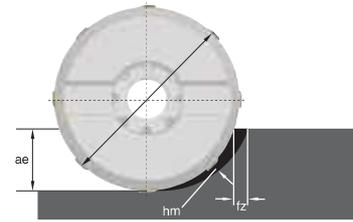
Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

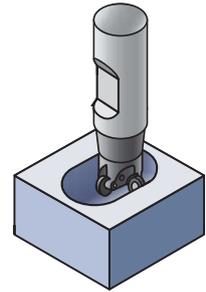
With round inserts, two factors can affect the hm: Ap1 and ae. fz has to be adjusted accordingly.

Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 1mm	1,01mm	0,77mm	0,63mm	0,55mm	0,49mm	0,35mm
Ap1 = 2mm	0,77mm	0,55mm	0,45mm	0,39mm	0,35mm	0,24mm
Ap1 = 3mm	0,63mm	0,45mm	0,37mm	0,32mm	0,28mm	0,20mm
Ap1 = 4mm	0,55mm	0,39mm	0,32mm	0,27mm	0,24mm	0,17mm
Ap1 = 5mm	0,49mm	0,35mm	0,28mm	0,24mm	0,22mm	0,15mm
Ap1 = 6mm	0,45mm	0,32mm	0,26mm	0,22mm	0,20mm	0,14mm



Example application highlighted.



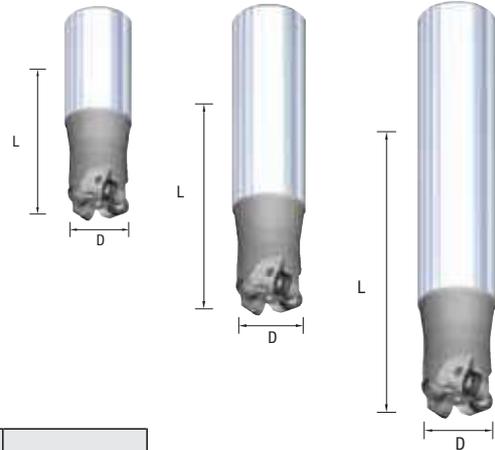
Example Cutting Conditions for RD..10... Insert in Pocketing, L/D ratio = 2 x D:

insert = RDPX12T3M0SN			TN2505			TN6525			TN6540		
			feed per tooth fz (mm)/ae>50%								
			min	med	max	min	med	max	min	med	max
Edge Geometry MM	ae>50%	Recommended starting Ap1 = 2mm	-	-	-	0,24mm	0,30mm	0,50mm	0,24mm	0,40mm	0,60mm
Edge Geometry MH	ae>50%	Recommended starting Ap1 = 2mm	0,24mm	0,30mm	0,50mm	0,24mm	0,40mm	0,65mm	0,24mm	0,50mm	0,70mm

2. Ap1 and vc corrections depend on L/D ratio

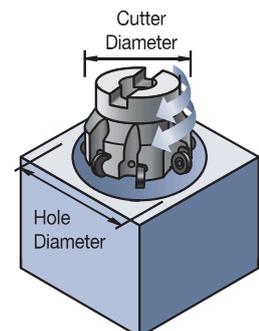
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

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

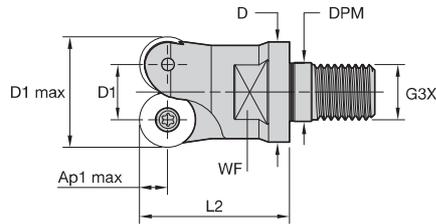


Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
24	25,6mm	36mm	1,3mm	15°	3mm
32	40,6mm	52mm	5,3mm	12°	4,4mm
35	46,9mm	58mm	6mm	11°	3,9mm
40	57,4mm	68mm	6mm	9,3°	3,3mm
42	61,2mm	72mm	6mm	7,2°	3,5mm
50	77,4mm	88mm	6mm	6,1°	3,5mm
52	81,3mm	92mm	6mm	4,5°	3,2mm
63	102,4mm	114mm	6mm	4,5°	4,6mm
66	108,5mm	120mm	6mm	4,5°	4,4mm
80	136,5mm	148mm	6mm	3,5°	4,2mm
100	176,5mm	188mm	6mm	2,2°	4,2mm



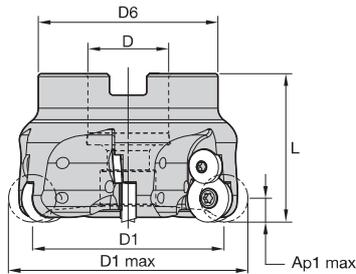
M170 • Screw-On RD1604.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926601	M170D032Z02M16RD16	32	16	29	17,0	M16	43	22	8,0	2	20.0	9950	Yes	0,17

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

M170 • Shell Mills RD1604.. • Metric



order number	catalogue number	D1 max	D1	D	D6	L	L1	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
3926602	M170D050Z04RD16	50	34	22	44	40	40	8,0	4	8.5	7900	Yes	0,28
3934623	M170D052Z04RD16	52	36	22	44	50	50	8,0	4	8.2	7650	Yes	0,36
3934624	M170D063Z05RD16	63	47	22	44	40	40	8,0	5	5.5	5300	Yes	0,39
3934626	M170D080Z06RD16	80	64	27	60	50	50	8,0	6	3.0	4900	Yes	1,06
3934629	M170D125Z08RD16	125	109	40	90	60	60	8,0	8	2.2	3200	Yes	2,90

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

INDEXABLE MILLING

SOLID END MILLING

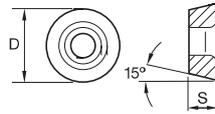
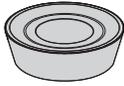
HOLEMAKING

TAPPING

TURNING

INDEXABLE MILLING

RDPX-MM • RD1604..



- first choice
- alternate choice

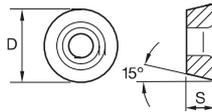
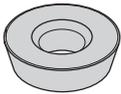
P	●	○	○	○
M	●	○	○	○
K	●	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1604M0SNMM	16,00	4,76	0,14	●	○	○

SOLID END MILLING

HOLEMAKING

RDPX-MH • RD1604..



- first choice
- alternate choice

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

catalogue number	D	S	hm	TN2505	TN6525	TN6540
RDPX1604M0SNMH	16,00	4,76	0,22	○	○	●

TAPPING

TURNING

Insert Selection Guide • M170 • RD16 • Metric

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	MM	TN6525	MM	TN6525	MM	TN6540
P3-P4	MH	TN2505	MH	TN6525	MH	TN6540
P5-P6	MH	TN2505	MH	TN6525	MH	TN6540
M1-M2	-	-	MM	TN6525	MM	TN6540
M3	-	-	MM	TN6525	MM	TN6540
K1-K2	MH	TN2505	MH	TN2505	MH	TN6525
K3	MH	TN2505	MH	TN2505	MH	TN6525
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	MM	TN6540	-	-
S3	-	-	MM	TN6540	-	-
S4	-	-	MM	TN6540	-	-
H1	MH	TN2505	MH	TN2505	-	-

Recommended Starting Speeds • M170 • RD1604 • Metric

Material Group		TN2505			TN6525			TN6540		
P	1	550	420	360	410	320	280	360	280	240
	2	320	240	205	320	250	215	250	190	170
	3	320	240	205	280	215	185	215	170	140
	4	-	-	-	235	170	145	180	130	110
	5	-	-	-	310	235	200	240	180	150
	6	-	-	-	205	160	130	160	120	100
M	1	-	-	-	190	120	80	130	80	60
	2	-	-	-	120	80	50	80	50	40
	3	-	-	-	125	80	55	85	50	40
K	1	400	300	250	275	245	220	220	205	180
	2	540	365	280	215	190	180	175	155	140
	3	310	190	155	180	160	145	155	145	125
N	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30
	2	-	-	-	-	-	-	25	20	10
	3	-	-	-	-	-	-	70	40	30
	4	-	-	-	-	-	-	60	30	25
H	1	175	140	95	-	-	-	-	-	-
	2	175	140	95	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-

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

Recommended Starting Feeds • M170 • RD16 • Metric

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,39	0,52	0,82	0,28	0,37	0,59	0,21	0,28	0,44	0,18	0,24	0,38	0,17	0,22	0,35	MM
MH	0,51	0,70	1,17	0,37	0,50	0,84	0,28	0,38	0,63	0,24	0,33	0,55	0,22	0,30	0,50	MH

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,45	0,60	0,94	0,32	0,43	0,68	0,24	0,32	0,51	0,21	0,28	0,44	0,19	0,26	0,40	MM
MH	0,59	0,81	1,36	0,43	0,58	0,97	0,32	0,43	0,72	0,28	0,38	0,63	0,25	0,35	0,58	MH

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,59	0,79	1,24	0,43	0,57	0,89	0,32	0,42	0,66	0,28	0,37	0,58	0,25	0,34	0,53	MM
MH	0,77	1,06	1,79	0,56	0,76	1,28	0,42	0,57	0,95	0,36	0,50	0,83	0,33	0,45	0,76	MH

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
MM	0,81	1,08	1,71	0,58	0,78	1,22	0,43	0,58	0,91	0,38	0,51	0,79	0,35	0,46	0,72	MM
MH	1,06	1,46	2,48	0,76	1,04	1,75	0,57	0,78	1,30	0,50	0,68	1,13	0,45	0,62	1,03	MH

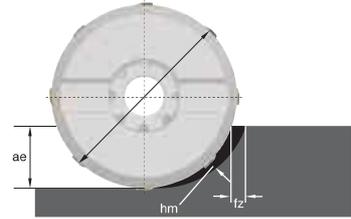
NOTE: Use "Light Machining" value as starting feed rate.

WIDIA Indexable Milling Additional Application Advice RD1604.. • M170

Selecting the Correct Cutting Values

1. fz depends on the Ap1 and ae values

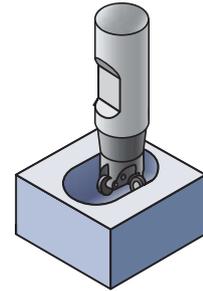
With round inserts, two factors can affect the hm: Ap1 and ae. fz has to be adjusted accordingly.



Recommended Starting Feed Rate Values (fz) Related to the Ap1 and ae Values:

ae engagement	10%	20%	30%	40%	50%	100%
Ap1 = 1mm	1,52mm	1,07mm	0,88mm	0,76mm	0,68mm	0,48mm
Ap1 = 2mm	1,07mm	0,76mm	0,62mm	0,54mm	0,48mm	0,34mm
Ap1 = 3mm	0,88mm	0,62mm	0,51mm	0,44mm	0,39mm	0,28mm
Ap1 = 4mm	0,76mm	0,54mm	0,44mm	0,38mm	0,34mm	0,24mm
Ap1 = 5mm	0,62mm	0,44mm	0,36mm	0,31mm	0,26mm	0,20mm
Ap1 = 6mm	0,54mm	0,38mm	0,31mm	0,27mm	0,24mm	0,17mm

Example application highlighted.



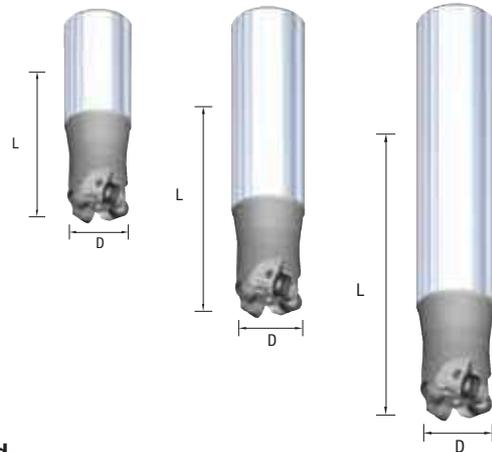
Example Cutting Conditions for iC16mm... Insert in Pocketing, up to 3 L/D approximately:

insert = RDPX1604M0SN			TN2505			TN6525			TN6540		
			feed per tooth fz (mm)/ae>50%								
			min	med	max	min	med	max	min	med	max
Edge Geometry MM	ae>50%	Recommended starting Ap1 = 3mm	-	-	-	0,28mm	0,45mm	0,65mm	0,28mm	0,50mm	0,70mm
Edge Geometry MH	ae>50%	Recommended starting Ap1 = 3mm	0,28mm	0,35mm	0,50mm	0,28mm	0,50mm	0,75mm	0,28mm	0,60mm	0,80mm

2. Ap1 and vc corrections depend on L/D ratio

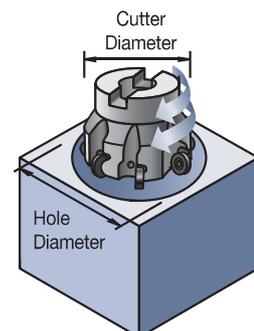
With increasing L/D ratios, or overhang, vibrations can occur due to reduced rigidity. To ensure successful application, it is recommended to adjust Ap1 and vc values according to the following table:

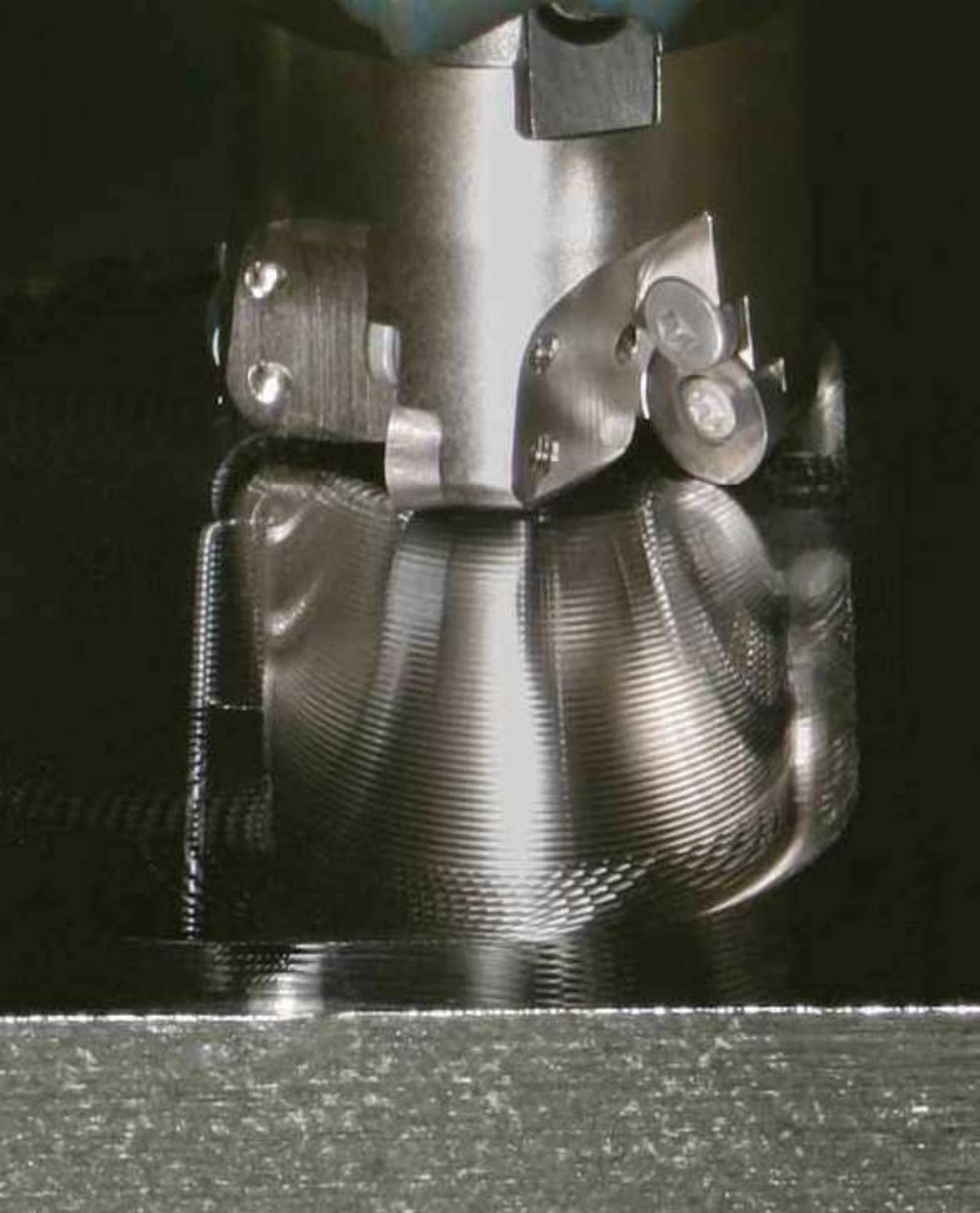
L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<2	0%	0%
2<L/D<4	65-75%	10-15%
>4	80-95%	20-40%



Recommended Cutting Conditions • Helical Interpolation from Solid

cutter diameter	min hole diameter	max hole diameter (flat bottom)	Ap1 max per revolution	max ramp angle	Ap1 max when plunging
32	36mm	48mm	3mm	20°	3mm
50	69mm	84mm	8mm	9,5°	4,8mm
52	73mm	88mm	8mm	8,2°	5mm
63	95mm	110mm	8mm	5,5°	4,7mm
66	101mm	120mm	8mm	4°	4,2mm
80	129mm	144mm	8mm	3°	4,1mm
100	169mm	184mm	8mm	2,4°	4,6mm
125	219mm	234mm	8mm	2,2°	4,4mm





M100™ Series

M100 IC06, M100 IC10, M100 IC12, M100 IC16, M100 IC18 Copy Mills

The M100 copy mill is a reliable multipurpose solution for copy milling, face milling, helical interpolation, and roughing. The strong and rigid body design paired with the thick inserts ensures consistent results in even the most demanding operations.

Thick inserts paired with the rigid body design provide rigidity and consistency.

Anti-rotation systems in the larger iC inserts provide stability to allow for higher depth of cuts.

Large chip gashes and through tool coolant capabilities provide smooth and increased chip evacuation.



The M100 copy mill is equipped with thick inserts, rigid body design, and anti-rotation systems to stay engaged with the workpiece in high depth of cuts.

INSERT OFFERING



08mm iC
RD Insert Type
Ground and PSTS



10mm iC
RD Insert Type
Ground and PSTS



12mm iC
RD Insert Type
Anti-Rotation Feature
Ground and PSTS



16mm iC
RD Insert Type
Anti-Rotation Feature
Ground and PSTS



16mm iC
RC Insert Type
Anti-Rotation Feature
Ground and PSTS

PROFILING AND COPY APPLICATIONS

PRODUCT

SERIES
M100™

DIAMETER RANGE

16–160mm

SHANK TYPES

Shell Mills
Weldon® End Mills
Screw-On End Mills

INDUSTRY



APPLICATIONS



FACE MILLING



HELICAL MILLING/
POCKET MILLING



3D PROFILING



POCKETING



RAMPING BLANK



SIDE MILLING/
SHOULDER MILLING: BALL NOSE



SLOTING

CONSISTENCY

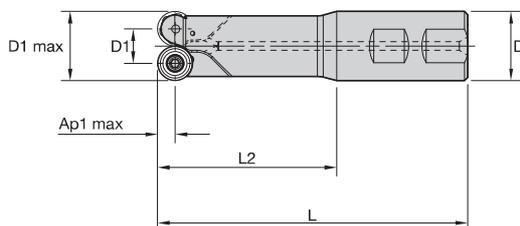
Thick inserts combined with the rigid body provide a strong foundation for consistent results.

STABILITY

Anti-rotation systems in the larger iC inserts provide a sure fit for stability in high depth of cuts.



M100 • Weldon® Shank RD0802.. • Metric



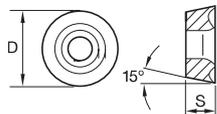
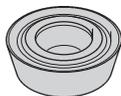
order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021333	12391010600	16	8	16	90	42	4,0	2	7.5	28000	Yes	0,10
2021334	12391011000	16	8	20	132	82	4,0	2	7.5	28000	Yes	0,20
2021335	12391011400	16	8	25	183	127	4,0	2	7.5	28000	Yes	0,40

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • RDMT-M0T • RD0802..

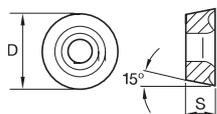
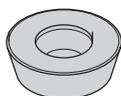


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT0802M0T	1	8,00	2,38	●	○	○	○	○	○	○	○
RDMT1003M0T	1	10,00	3,18	○	○	○	○	○	○	○	○

M100 • RDMW-M0 / -M0T • RD0802..



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW0802M0	1	8,00	2,38	0,09	○	○	○	○	○	○	○	○
RDMW0802M0T	1	8,00	2,38	0,09	○	○	○	○	○	○	○	○

M100 • RD08 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	RDMT-T	WP35CM	RDMT-T	WP35CM	RDMT-T	WP35CM
P3-P4	RDMT-T	WP35CM	RDMW-T	TN6540	RDMW-T	TN6540
P5-P6	RDMT-T	WP35CM	RDMT-T	WP35CM	RDMT-T	WP35CM
M1-M2	RDMT-T	WP35CM	RDMT-T	WP35CM	RDMT-T	WP35CM
M3	RDMT-T	WP35CM	RDMT-T	WP35CM	RDMT-T	WP35CM
K1-K2	-	-	RDMT-T	WP35CM	RDMT-T	WP35CM
K3	-	-	RDMT-T	WP35CM	RDMT-T	WP35CM

M100 • RD08 • Recommended Starting Speeds [m/min]

Material Group	THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM			
P	1	-	-	-	410	320	280	360	280	240	230	200	190	-	-	-	455	395	370	-	-	-	-	-	-
	2	-	-	-	320	250	215	250	190	170	195	170	140	-	-	-	280	255	230	-	-	-	-	-	-
	3	-	-	-	280	215	185	215	170	140	180	150	125	-	-	-	255	230	205	-	-	-	-	-	-
	4	-	-	-	235	170	145	180	130	110	160	130	105	-	-	-	190	175	160	-	-	-	-	-	-
	5	-	-	-	310	235	200	240	180	150	-	-	-	-	-	-	260	230	210	-	-	-	205	175	145
	6	-	-	-	205	160	130	160	120	100	-	-	-	-	-	-	160	135	110	-	-	-	180	130	95
M	1	-	-	-	190	120	80	130	80	60	-	-	-	-	-	-	205	185	155	270	240	220	250	205	170
	2	-	-	-	120	80	50	80	50	40	-	-	-	-	-	-	185	160	140	245	215	175	215	175	145
	3	-	-	-	125	80	55	85	50	40	-	-	-	-	-	-	145	130	115	185	160	125	175	130	100
K	1	120	90	75	275	245	220	220	205	180	-	-	-	505	460	410	295	265	240	-	-	-	-	-	-
	2	125	100	70	215	190	180	175	155	140	-	-	-	400	355	330	235	210	190	-	-	-	-	-	-
	3	130	95	60	180	160	145	155	145	125	-	-	-	335	300	275	195	175	160	-	-	-	-	-	-
N	1	900	600	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	685	465	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	450	280	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-	-	-	-	65	55	35	60	50	30
	4	-	-	-	-	-	-	60	30	25	-	-	-	-	-	-	66	50	33	100	70	50	70	60	35
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M100 • RD08 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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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.

INDEXABLE MILLING

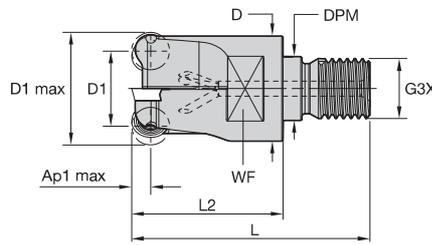
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

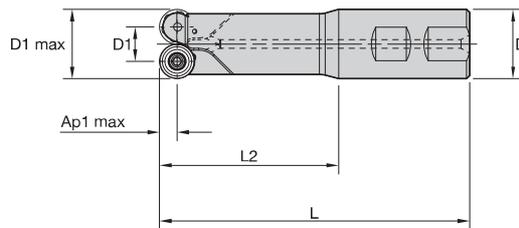
M100 • Screw-On RD1003.. • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021375	12391050400	25	15	22	12,5	M12	52	30	19	5,0	2	15,8	22000	Yes	0,10
2021376	12391050600	30	20	28	17,0	M16	63	40	22	5,0	3	10,3	20000	Yes	0,20

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

M100 • Weldon® Shank RD1003.. • Metric

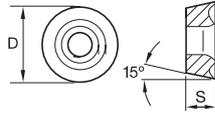
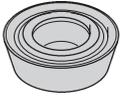


order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021336	12391011600	20	10	20	92	42	5,0	2	7,8	25000	Yes	0,20
2021337	12391012000	20	10	25	138	82	5,0	2	8,8	25000	Yes	0,40
2021339	12391012800	26	16	32	142	82	5,0	2	13,5	22000	Yes	0,60
2021340	12391013200	26	16	32	187	127	5,0	2	14,3	22000	Yes	0,90

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • RDMT-M0T • RD1003..

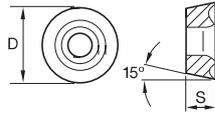
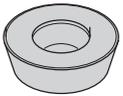


- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT1003M0	1	10,00	3,18	0,14	2012538	●	●	●	●	○	○	○
RDMT1003M0T	1	10,00	3,18	0,14	2957429	○	○	○	○	○	○	○

M100 • RDMW-M0 / -M0T • RD1003..



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW1003M0T	1	10,00	3,18	0,14	3353279	○	○	○	○	○	○	○
RDMW1003M0	1	10,00	3,18	—	6724747	○	○	○	○	○	○	○

M100 • RD10 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	RDMT-T	TN6525	RDMT-T	TN6540	RDMW-T	TN6540
P3-P4	RDMT-T	TN6525	RDMW-T	TN6540	RDMW-T	TN6540
P5-P6	RDMT-T	TN6525	RDMW-T	TN6540	RDMW-T	TN6540
M1-M2	RDMT-T	TN6540	RDMT-T	TN6540	RDMT-T	TN6540
M3	RDMT-T	TN6540	RDMT-T	TN6540	RDMT-T	TN6540
K1-K2	RDMW-MH	TN2510	RDMW-MH	TN2510	RDMW	WK15CM
K3	RDMW-MH	TN2510	RDMW-MH	TN2510	RDMW	WK15CM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	RDMT-T	TN6540	-	-
S3	-	-	RDMT-T	TN6540	-	-
S4	-	-	RDMT-T	TN6540	RDMT-T	TN6540
H1	RDMW-MH	TN2510	RDMW-MH	TN2510	-	-

M100 • RD10 • Recommended Starting Speeds [m/min]

Material Group	THM	TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM					
P	1	-	-	-	410	320	280	360	280	240	230	200	190	-	-	-	455	395	370	-	-	-	-	-	-
	2	-	-	-	320	250	215	250	190	170	195	170	140	-	-	-	280	255	230	-	-	-	-	-	-
	3	-	-	-	280	215	185	215	170	140	180	150	125	-	-	-	255	230	205	-	-	-	-	-	-
	4	-	-	-	235	170	145	180	130	110	160	130	105	-	-	-	190	175	160	-	-	-	-	-	-
	5	-	-	-	310	235	200	240	180	150	-	-	-	-	-	-	260	230	210	-	-	-	205	175	145
	6	-	-	-	205	160	130	160	120	100	-	-	-	-	-	-	160	135	110	-	-	-	180	130	95
M	1	-	-	-	190	120	80	130	80	60	-	-	-	-	-	-	205	185	155	270	240	220	250	205	170
	2	-	-	-	120	80	50	80	50	40	-	-	-	-	-	-	185	160	140	245	215	175	215	175	145
	3	-	-	-	125	80	55	85	50	40	-	-	-	-	-	-	145	130	115	185	160	125	175	130	100
K	1	120	90	75	275	245	220	220	205	180	-	-	-	505	460	410	295	265	240	-	-	-	-	-	-
	2	125	100	70	215	190	180	175	155	140	-	-	-	400	355	330	235	210	190	-	-	-	-	-	-
	3	130	95	60	180	160	145	155	145	125	-	-	-	335	300	275	195	175	160	-	-	-	-	-	-
N	1	900	600	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	685	465	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	450	280	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-	-	-	-	65	55	35	60	50	30
	4	-	-	-	-	-	-	60	30	25	-	-	-	-	-	-	66	50	33	100	70	50	70	60	35
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M100 • RD10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHT-T	0,23	0,39	0,65	0,17	0,28	0,47	0,13	0,21	0,35	0,11	0,18	0,31	0,10	0,17	0,28	RDHT-T
RDHW-MH	0,23	0,42	0,88	0,17	0,30	0,63	0,13	0,23	0,47	0,11	0,20	0,41	0,10	0,18	0,38	RDHW-MH
RDMT-T	0,23	0,39	0,65	0,17	0,28	0,47	0,13	0,21	0,35	0,11	0,18	0,31	0,10	0,17	0,28	RDMT-T
RDMW	0,23	0,21	0,61	0,17	0,15	0,44	0,13	0,11	0,33	0,11	0,10	0,28	0,10	0,09	0,26	RDMW
RDMW-T	0,23	0,57	0,88	0,17	0,41	0,63	0,13	0,31	0,47	0,11	0,27	0,41	0,10	0,25	0,38	RDMW-T

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHT-T	0,29	0,49	0,82	0,21	0,35	0,59	0,16	0,26	0,44	0,14	0,23	0,38	0,13	0,21	0,35	RDHT-T
RDHW-MH	0,29	0,53	1,11	0,21	0,38	0,79	0,16	0,28	0,59	0,14	0,25	0,52	0,13	0,23	0,47	RDHW-MH
RDMT-T	0,29	0,49	0,82	0,21	0,35	0,59	0,16	0,26	0,44	0,14	0,23	0,38	0,13	0,21	0,35	RDMT-T
RDMW	0,29	0,26	0,76	0,21	0,19	0,55	0,16	0,14	0,41	0,14	0,12	0,36	0,13	0,11	0,33	RDMW
RDMW-T	0,29	0,71	1,11	0,21	0,51	0,79	0,16	0,38	0,59	0,14	0,33	0,52	0,13	0,31	0,47	RDMW-T

At 1,00mm Axial Depth of Cut (ap)

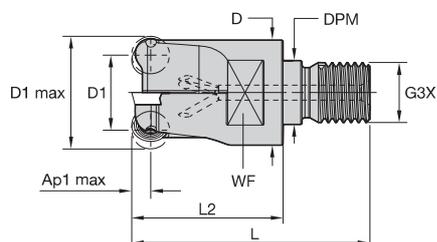
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHT-T	0,39	0,65	1,09	0,28	0,47	0,78	0,21	0,35	0,58	0,18	0,31	0,51	0,17	0,28	0,47	RDHT-T
RDHW-MH	0,39	0,71	1,49	0,28	0,51	1,06	0,21	0,38	0,79	0,18	0,33	0,69	0,17	0,30	0,63	RDHW-MH
RDMT-T	0,39	0,65	1,09	0,28	0,47	0,78	0,21	0,35	0,58	0,18	0,31	0,51	0,17	0,28	0,47	RDMT-T
RDMW	0,39	0,35	1,02	0,28	0,25	0,73	0,21	0,19	0,55	0,18	0,16	0,48	0,17	0,15	0,44	RDMW
RDMW-T	0,39	0,95	1,49	0,28	0,69	1,06	0,21	0,51	0,79	0,18	0,45	0,69	0,17	0,41	0,63	RDMW-T

At 0,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHT-T	0,53	0,90	1,52	0,38	0,65	1,08	0,29	0,48	0,81	0,25	0,42	0,70	0,23	0,39	0,64	RDHT-T
RDHW-MH	0,53	0,98	2,07	0,38	0,70	1,47	0,29	0,52	1,09	0,25	0,46	0,95	0,23	0,42	0,87	RDHW-MH
RDMT-T	0,53	0,90	1,52	0,38	0,65	1,08	0,29	0,48	0,81	0,25	0,42	0,70	0,23	0,39	0,64	RDMT-T
RDMW	0,53	0,48	1,41	0,38	0,35	1,01	0,29	0,26	0,75	0,25	0,23	0,65	0,23	0,21	0,60	RDMW
RDMW-T	0,53	1,32	2,07	0,38	0,95	1,47	0,29	0,70	1,09	0,25	0,61	0,95	0,23	0,56	0,87	RDMW-T

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

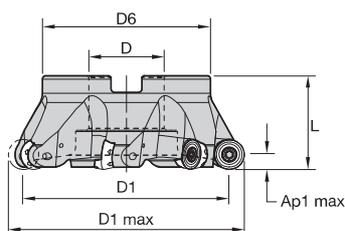
M100 • Screw-On RD1204... • Metric



order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021374	12391050200	24	12	22	12,5	M12	52	30	19	6,0	2	10,0	23000	Yes	0,10
2021378	12391051000	35	23	28	17,0	M16	63	40	22	6,0	3	10,8	19000	Yes	0,20
2021379	12391051200	40	28	28	17,0	M16	63	40	22	6,0	4	8,3	17000	Yes	0,30

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

M100 • Shell Mills RD1204... • Metric



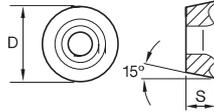
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021342	12391020000	50	38	22	40	40	6,0	4	6,8	15000	Yes	0,20
2021361	12391024000	52	40	22	40	40	6,0	4	6,5	15000	Yes	0,20
2021343	12391020200	63	51	27	48	40	6,0	5	4,5	14000	Yes	0,30
2021344	12391020400	80	68	27	60	50	6,0	6	3,5	12000	Yes	0,90
2021345	12391020600	100	88	32	78	50	6,0	6	2,5	11000	No	1,20

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • RDMT-TX • RD1204..

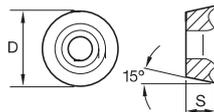


- first choice
- alternate choice

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

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT1204M0TX	6	12,00	4,76	0,15	■	2957430	2957432	2012546	■	■	5520247	■
RDMT1204M0TX	6	12,00	4,76	—	■	■	■	6724748	■	6901188	■	■

M100 • RDMW-TX • RD1204..

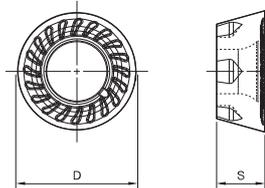


- first choice
- alternate choice

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

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW1204M0TX	6	12,00	4,76	0,15	■	■	3353281	2012600	5427441	■	■	■
RDMW1204M0TX	6	12,00	4,76	—	■	■	■	■	6901190	■	■	■

M100 • RDPT-MMX • RD1204..



- first choice
- alternate choice

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

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDPT1204M0SMMX	6	12,00	4,76	0,18	■	■	5176974	■	■	■	■	6412897
RDPT1204M0SMMX4	4	12,00	4,76	—	■	■	■	■	■	■	■	6412898
RDPT1204M0SMMX	6	12,00	4,76	—	■	■	■	■	6901783	■	■	■

M100 • RD12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	RDMT-TX	WP35CM	RDMT-TX	TN6540	RDMT-TX	TN6540
P3-P4	RDMT-TX	WP35CM	RDMW-TX	TN6540	RDMW-TX	TN6540
P5-P6	RDMT-TX	WP35CM	RDPT-MMX	WP35CM	RDPT-MMX	WP35CM
M1-M2	RDHT-TX	WS30PM	RDMT-TX	TN6540	RDPT-MMX	TN6540
M3	RDHT-TX	WS30PM	RDMT-TX	TN6540	RDPT-MMX	TN6540
K1-K2	RDMW-TX	WK15CM	RDMW-TX	WK15CM	RDMW-TX	WK15CM
K3	RDHW-MH	TN2510	RDMW-TX	WK15CM	RDMW-TX	WK15CM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	RDMT-TX	TN6540	-	-
S3	-	-	RDMT-TX	TN6540	-	-
S4	-	-	RDMT-TX	TN6540	RDPT-MMX	TN6540
H1	RDHW-MH	TN2510	RDHW-MH	TN2510	-	-

M100 • RD12 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	-	-	-	410	320	280	360	280	240	230	200	190	-	-	-	455	395	370	-	-	-	-	-	-
	2	-	-	-	320	250	215	250	190	170	195	170	140	-	-	-	280	255	230	-	-	-	-	-	-
	3	-	-	-	280	215	185	215	170	140	180	150	125	-	-	-	255	230	205	-	-	-	-	-	-
	4	-	-	-	235	170	145	180	130	110	160	130	105	-	-	-	190	175	160	-	-	-	-	-	-
	5	-	-	-	310	235	200	240	180	150	-	-	-	-	-	-	260	230	210	-	-	-	205	175	145
	6	-	-	-	205	160	130	160	120	100	-	-	-	-	-	-	160	135	110	-	-	-	180	130	95
M	1	-	-	-	190	120	80	130	80	60	-	-	-	-	-	-	205	185	155	270	240	220	250	205	170
	2	-	-	-	120	80	50	80	50	40	-	-	-	-	-	-	185	160	140	245	215	175	215	175	145
	3	-	-	-	125	80	55	85	50	40	-	-	-	-	-	-	145	130	115	185	160	125	175	130	100
K	1	120	90	75	275	245	220	220	205	180	-	-	-	505	460	410	295	265	240	-	-	-	-	-	-
	2	125	100	70	215	190	180	175	155	140	-	-	-	400	355	330	235	210	190	-	-	-	-	-	-
	3	130	95	60	180	160	145	155	145	125	-	-	-	335	300	275	195	175	160	-	-	-	-	-	-
N	1	900	600	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	685	465	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	450	280	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-	-	-	-	65	55	35	60	50	30
	4	-	-	-	-	-	-	60	30	25	-	-	-	-	-	-	66	50	33	100	70	50	70	60	35
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M100 • RD12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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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.

INDEXABLE MILLING

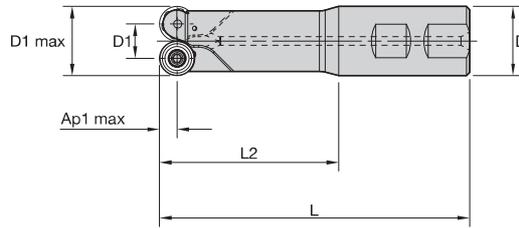
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

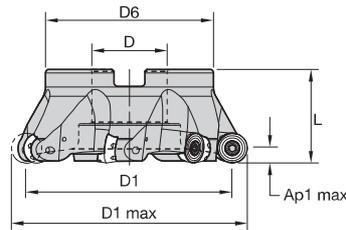
M100 • Weldon® Shank RD1605.. • Metric



order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021341	12391013800	32	16	32	142	82	8,0	2	7.8	19000	Yes	1,10

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

M100 • Shell Mills RD1605.. • Metric

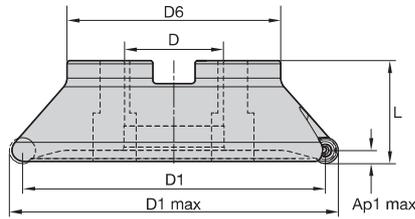


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021347	12391021000	50	34	22	40	40	8,0	4	10.3	13000	Yes	0,20
2021348	12391021200	63	47	27	48	40	8,0	4	7.0	12000	Yes	0,30
2021349	12391021400	80	64	27	60	50	8,0	5	4.8	10000	Yes	0,90
2021350	12391021600	100	84	32	78	50	8,0	6	3.8	9000	No	1,20
2021351	12391021800	125	109	40	89	50	8,0	7	2.8	8000	No	1,70

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

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M100 • Shell Mills RC1606.. • Metric



order number	catalogue number	D1 max	D1	D	D4	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021358	12391023400	50	34	22	—	40	40	8,0	4	6.0	13000	Yes	0,20
2021359	12391023600	52	36	22	—	40	40	8,0	4	5.8	13000	Yes	0,30
2021357	12391023200	63	47	27	—	48	40	8,0	5	4.0	12000	Yes	0,20
2021360	12391023800	66	50	27	—	48	40	8,0	5	3.8	12000	Yes	0,30
2021352	12391022000	80	64	27	—	60	50	8,0	6	2.8	10000	Yes	0,90
2021353	12391022200	100	84	32	—	78	50	8,0	7	2.3	9000	No	1,20
2021354	12391022400	125	109	40	—	89	50	8,0	8	1.8	8000	No	1,80
2021355	12391022600	160	144	40	67	90	63	8,0	9	1.3	7000	No	2,90

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

INDEXABLE MILLING

SOLID END MILLING

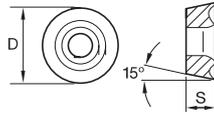
HOLEMAKING

TAPPING

TURNING

INDEXABLE MILLING

M100 • RDMT-MOTX • RD1605..



- first choice
- alternate choice

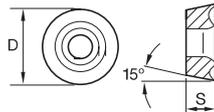
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M	■	○	○	○	○	○	○
K	■	○	○	○	○	○	○
N	■	○	○	○	○	○	○
S	■	○	○	○	○	○	○
H	■	○	○	○	○	○	○

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMT1605M0TX	6	16,00	5,56	—	■	■	■	■	■	○	○	○

SOLID END MILLING

HOLEMAKING

M100 • RDMW-MOTX • RD1605..



- first choice
- alternate choice

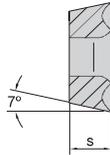
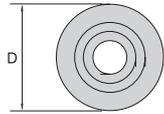
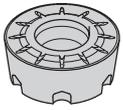
P	■	■	●	●	●	○	○
M	■	○	○	○	○	○	○
K	■	○	○	○	○	○	○
N	■	○	○	○	○	○	○
S	■	○	○	○	○	○	○
H	■	○	○	○	○	○	○

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RDMW1605M0TX	6	16,00	5,56	0,15	■	■	3523083	2012608	■	■	■	■
RDMW1605M0TX	6	16,00	5,56	—	■	■	■	■	■	6901191	■	■

TAPPING

TURNING

M100 • RCMT-43 • RC1606..

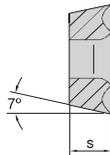
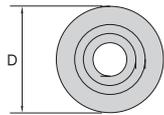


- first choice
- alternate choice

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

ISO catalogue number	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RCMT1606M043M	16,00	6,35	0,20	■	○	○	○	○	○	○	○
RCMT1606M043	16,00	6,35	0,20	○	○	○	○	○	○	○	○

M100 • RCMT-MOTX • RC1606..



- first choice
- alternate choice

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

ISO catalogue number	number of indexes	D	S	hm	THM	TN6525	TN6540	TTM08	WK15CM	WP35CM	WS30PM	WS40PM
RCMT1606M0TX	6	16,00	6,35	0,24	■	○	○	○	○	○	○	○
RCMT1606M0TX	6	16,00	6,35	—	○	○	○	○	○	○	○	○

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M100 • RD1605 • 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	WP35CM	RDMT-TX	WP35CM	RDMT-TX	WP35CM
M1-M2	RDMT-TX	TN6525	RDMT-TX	TN6540	RDMT-TX	TN6540
M3	RDMT-TX	TN6525	RDMT-TX	TN6540	RDMT-TX	TN6540
K1-K2	RDMW-TX	TN2510	RDMW-TX	WP35CM	RDMW-TX	WP35CM
K3	RDMW-TX	TN2510	RDMW-TX	WP35CM	RDMW-TX	WP35CM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	RDMT-TX	TN6540	-	-
S3	-	-	RDMT-TX	TN6540	-	-
S4	-	-	RDMT-TX	TN6540	RDMT-TX	TN6540
H1	RDMW-TX	TN2510	RDMW-TX	TN2510	-	-

M100 • RD1605 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
P	1	-	-	-	410	320	280	360	280	240	230	200	190	-	-	-	455	395	370	-	-	-	-	-	-
	2	-	-	-	320	250	215	250	190	170	195	170	140	-	-	-	280	255	230	-	-	-	-	-	-
	3	-	-	-	280	215	185	215	170	140	180	150	125	-	-	-	255	230	205	-	-	-	-	-	-
	4	-	-	-	235	170	145	180	130	110	160	130	105	-	-	-	190	175	160	-	-	-	-	-	-
	5	-	-	-	310	235	200	240	180	150	-	-	-	-	-	-	260	230	210	-	-	-	205	175	145
	6	-	-	-	205	160	130	160	120	100	-	-	-	-	-	-	160	135	110	-	-	-	180	130	95
M	1	-	-	-	190	120	80	130	80	60	-	-	-	-	-	205	185	155	270	240	220	250	205	170	
	2	-	-	-	120	80	50	80	50	40	-	-	-	-	-	185	160	140	245	215	175	215	175	145	
	3	-	-	-	125	80	55	85	50	40	-	-	-	-	-	145	130	115	185	160	125	175	130	100	
K	1	120	90	75	275	245	220	220	205	180	-	-	-	505	460	410	295	265	240	-	-	-	-	-	
	2	125	100	70	215	190	180	175	155	140	-	-	-	400	355	330	235	210	190	-	-	-	-	-	
	3	130	95	60	180	160	145	155	145	125	-	-	-	335	300	275	195	175	160	-	-	-	-	-	
N	1	900	600	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	685	465	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3	450	280	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-	-	-	55	50	35	50	40	30	
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-	-	-	55	50	35	50	40	30	
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-	-	-	65	55	35	60	50	30	
	4	-	-	-	-	-	-	60	30	25	-	-	-	-	-	-	-	-	66	50	33	100	70	50	
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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

M100 • RD1605 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHX-TX	0,11	0,35	0,70	0,08	0,25	0,50	0,06	0,19	0,38	0,05	0,16	0,33	0,05	0,15	0,30	RDHX-TX
RDMT-TX	0,23	0,42	0,84	0,17	0,30	0,60	0,13	0,23	0,45	0,11	0,20	0,39	0,10	0,18	0,36	RDMT-TX
RDMW-TX	0,23	0,52	1,05	0,17	0,38	0,76	0,13	0,28	0,56	0,11	0,25	0,49	0,10	0,23	0,45	RDMW-TX

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHX-TX	0,13	0,40	0,81	0,10	0,29	0,58	0,07	0,22	0,43	0,06	0,19	0,38	0,06	0,17	0,35	RDHX-TX
RDMT-TX	0,27	0,48	0,97	0,19	0,35	0,70	0,14	0,26	0,52	0,13	0,23	0,45	0,12	0,21	0,42	RDMT-TX
RDMW-TX	0,27	0,60	1,22	0,19	0,44	0,87	0,14	0,33	0,65	0,13	0,28	0,57	0,12	0,26	0,52	RDMW-TX

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHX-TX	0,17	0,53	1,06	0,13	0,38	0,76	0,09	0,28	0,57	0,08	0,25	0,50	0,08	0,23	0,45	RDHX-TX
RDMT-TX	0,35	0,63	1,28	0,25	0,46	0,92	0,19	0,34	0,68	0,17	0,30	0,59	0,15	0,27	0,54	RDMT-TX
RDMW-TX	0,35	0,79	1,61	0,25	0,57	1,15	0,19	0,43	0,85	0,17	0,37	0,74	0,15	0,34	0,68	RDMW-TX

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
RDHX-TX	0,24	0,72	1,46	0,17	0,52	1,04	0,13	0,39	0,78	0,11	0,34	0,68	0,10	0,31	0,62	RDHX-TX
RDMT-TX	0,48	0,87	1,76	0,35	0,62	1,26	0,26	0,47	0,93	0,23	0,41	0,81	0,21	0,37	0,74	RDMT-TX
RDMW-TX	0,48	1,09	2,22	0,35	0,78	1,58	0,26	0,58	1,17	0,23	0,51	1,02	0,21	0,46	0,93	RDMW-TX

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

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M100 • RC1606 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	...TX	TN6525	...43M	TN6540	...43M	TN6540
P3-P4	...TX	TN6525	...TX	TN6540	...43M	TN6540
P5-P6	...TX	TN6525	...TX	WP35CM	...TX	WP35CM
M1-M2	...TX	TN6525	...TX	TN6540	...TX	TN6540
M3	...TX	TN6525	...TX	TN6540	...TX	TN6540
K1-K2	...43	TN2510	...TX	WK15CM	...TX	WK15CM
K3	...TX	TN6525	...TX	WK15CM	...TX	WK15CM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	-	-	-	-
S3	-	-	-	-	-	-
S4	...43M	TN6540	...TX	TN6540	...TX	TN6540
H1	-	-	...TX	TN2510	-	-

M100 • RC1606 • Recommended Starting Speeds [m/min]

Material Group		THM			TN6525			TN6540			TTM08			WK15CM			WP35CM			WS30PM			WS40PM		
P	1	-	-	-	410	320	280	360	280	240	230	200	190	-	-	-	455	395	370	-	-	-	-	-	-
	2	-	-	-	320	250	215	250	190	170	195	170	140	-	-	-	280	255	230	-	-	-	-	-	-
	3	-	-	-	280	215	185	215	170	140	180	150	125	-	-	-	255	230	205	-	-	-	-	-	-
	4	-	-	-	235	170	145	180	130	110	160	130	105	-	-	-	190	175	160	-	-	-	-	-	-
	5	-	-	-	310	235	200	240	180	150	-	-	-	-	-	-	260	230	210	-	-	-	205	175	145
	6	-	-	-	205	160	130	160	120	100	-	-	-	-	-	-	160	135	110	-	-	-	180	130	95
M	1	-	-	-	190	120	80	130	80	60	-	-	-	-	-	-	205	185	155	270	240	220	250	205	170
	2	-	-	-	120	80	50	80	50	40	-	-	-	-	-	-	185	160	140	245	215	175	215	175	145
	3	-	-	-	125	80	55	85	50	40	-	-	-	-	-	-	145	130	115	185	160	125	175	130	100
K	1	120	90	75	275	245	220	220	205	180	-	-	-	505	460	410	295	265	240	-	-	-	-	-	-
	2	125	100	70	215	190	180	175	155	140	-	-	-	400	355	330	235	210	190	-	-	-	-	-	-
	3	130	95	60	180	160	145	155	145	125	-	-	-	335	300	275	195	175	160	-	-	-	-	-	-
N	1	900	600	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	685	465	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	450	280	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-	-	-	-	55	50	35	50	40	30
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-	-	-	-	65	55	35	60	50	30
	4	-	-	-	-	-	-	60	30	25	-	-	-	-	-	-	66	50	33	100	70	50	70	60	35
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

M100 • RC1606 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)ç															Insert Geometry
	5%			10%			20%			30%			40-100%			
...43	0,46	0,60	0,93	0,33	0,44	0,67	0,25	0,33	0,50	0,22	0,28	0,44	0,20	0,26	0,40	...43
...TX	0,46	0,70	1,12	0,33	0,50	0,81	0,25	0,38	0,60	0,22	0,33	0,52	0,20	0,30	0,48	...TX

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
...43	0,54	0,70	1,08	0,39	0,50	0,78	0,29	0,38	0,58	0,25	0,33	0,50	0,23	0,30	0,46	...43
...TX	0,54	0,81	1,30	0,39	0,58	0,93	0,29	0,43	0,69	0,25	0,38	0,61	0,23	0,35	0,55	...TX

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
...43	0,70	0,92	1,42	0,51	0,66	1,02	0,38	0,49	0,76	0,33	0,43	0,66	0,30	0,39	0,60	...43
...TX	0,70	1,06	1,72	0,51	0,76	1,23	0,38	0,57	0,91	0,33	0,50	0,79	0,30	0,45	0,73	...TX

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
...43	0,96	1,26	1,97	0,69	0,90	1,40	0,52	0,67	1,04	0,45	0,59	0,90	0,41	0,54	0,83	...43
...TX	0,96	1,46	2,38	0,69	1,04	1,68	0,52	0,78	1,25	0,45	0,68	1,08	0,41	0,62	0,99	...TX

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

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M270™ Series

M270 Toroidal, M270 High-Feed, M270 Ball Nose Copy Mills

With precision-engineered ball nose, toroidal, and high-feed inserts, the M270 Copy Mill Series provides the highest accuracy and insert stability for exceptional reliability and performance in semi-finishing and finishing applications.



Secure and rigid insert clamping.

Toroidal and high-feed inserts can use the same holder.

V-shaped contact faces enable maximum stability and accuracy.

Inserts offered can machine steel, stainless steel, cast iron, high-temp alloys, and hardened materials.

The M270 Series offers reliability and accuracy in semi-finishing and finishing operations with rigid insert clamping and V-shaped contact faces in various materials.

INSERTS

BF/BR



Ball nose inserts

TF



Toroidal inserts

HF



High-feed inserts

ACCURATE AND RELIABLE WITH M270

PRODUCT

SERIES

M270™

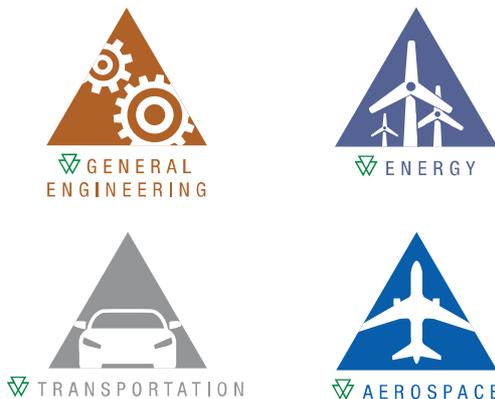
DIAMETER RANGE

10–32mm

SHANK TYPES

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

INDUSTRY



APPLICATIONS



3D
PROFILING



FACE
MILLING



HELICAL
MILLING/
POCKET
MILLING



POCKETING



RAMPING
BLANK



SIDE MILLING/
SHOULDER
MILLING: BALL
NOSE



SIDE MILLING/
SHOULDER
MILLING:
SQUARE END



SLOTING:
BALL NOSE



SLOTING:
SQUARE END

ACCURATE

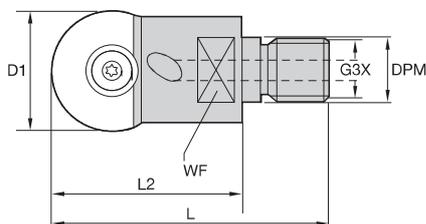
V-shaped contact faces ensure highly accurate insert positioning.

RELIABLE

Secure insert clamping provides a rigid setup for machining operations.



M270 Ball Nose • Screw-On • Metric



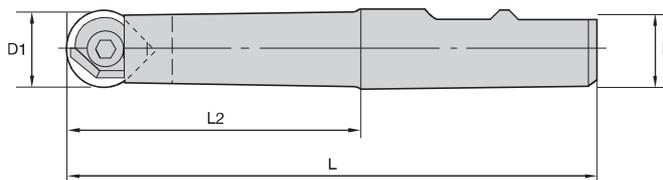
order number	catalogue number	D1	DPM	G3X	L	L2	WF	Z	Z U	insert	max RPM	coolant supply	kg
2243624	M270BD010M08	10	8,5	M8	42	25	10,0	1	2	M270B.10	57000	Yes	0,05
2243625	M270BD012M08	12	8,5	M8	42	25	10,0	1	2	M270B.12	55000	Yes	0,05
2243626	M270BD016M08	16	8,5	M8	47	30	10,0	1	2	M270B.16	53000	Yes	0,05
2243627	M270BD020M10	20	10,5	M10	59	40	14,0	1	2	M270B.20	52000	Yes	0,10
2243628	M270BD025M12	25	12,5	M12	72	50	19,0	1	2	M270B.25	50000	Yes	0,10
2243629	M270BD032M16	32	17,0	M16	73	50	22,0	1	2	M270B.32	46000	Yes	0,20

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 Ball Nose • Weldon® Shank • Metric



order number	catalogue number	D1	D	L	L2	Z	Z U	insert	max RPM	coolant supply	kg
2243618	M270BD010B12L90	10	12	90	45	1	2	M270B.10	57000	No	0,10
2243619	M270BD012B12L95	12	12	95	50	1	2	M270B.12	55000	No	0,10
2243620	M270BD016B16L105	16	16	105	57	1	2	M270B.16	53000	No	0,10
2243621	M270BD020B20L120	20	20	120	70	1	2	M270B.20	52000	No	0,20
2243622	M270BD025B25L145	25	25	145	89	1	2	M270B.25	50000	No	0,40
2243623	M270BD032B32L155	32	32	155	95	1	2	M270B.32	46000	No	0,80

NOTE: ZU = Effective teeth

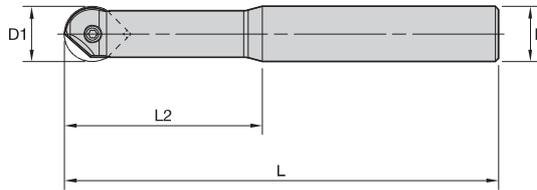
Z = number of pocket seats

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M270 Ball Nose • Cylindrical Shank • Metric



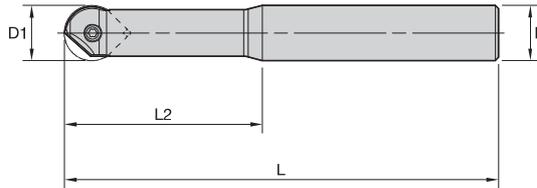
order number	catalogue number	D1	D	L	L2	Z	Z U	insert	max RPM	coolant supply	kg
2243613	M270BD010A12L140	10	12	140	45	1	2	M270B.10	57000	No	0,10
2243614	M270BD012A12L145	12	12	145	50	1	2	M270B.12	55000	No	0,10
2067470	M270BD016A16L155	16	16	155	57	1	2	M270B.16	53000	No	0,20
2243615	M270BD020A20L170	20	20	170	70	1	2	M270B.20	52000	No	0,40
2243616	M270BD025A25L195	25	25	195	89	1	2	M270B.25	50000	No	0,60
2243617	M270BD032A32L205	32	32	205	95	1	2	M270B.32	46000	No	1,10

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 Ball Nose • Carbide Cylindrical Shank • Metric



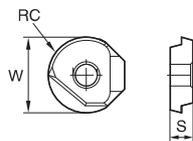
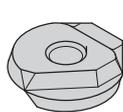
order number	catalogue number	D1	D	L	L2	Z	Z U	insert	max RPM	coolant supply	kg
2424550	M270BD010A12L140C	10	12	140	45	1	2	M270B.10	57000	Yes	0,20
2424587	M270BD012A12L145C	12	12	145	50	1	2	M270B.12	55000	Yes	0,20
2424634	M270BD016A16L155C	16	16	155	57	1	2	M270B.16	53000	Yes	0,40
2639257	M270BD020A20L170C	20	20	170	70	1	2	M270B.20	52000	Yes	0,65

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 Ball Nose • BF MM

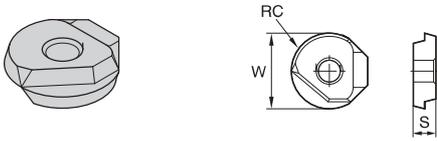


- first choice
- alternate choice

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

catalogue number	W	S	RC	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270BF10	10,00	2,38	5,00	0,08	●	○	○	○	○
M270BF10	10,00	2,38	5,00	—	○	○	○	○	●
M270BF12	12,00	3,18	6,00	0,08	●	○	○	○	○
M270BF12	12,00	3,18	6,00	—	○	○	○	○	●
M270BF16	16,00	4,76	8,00	0,08	●	○	○	○	○
M270BF16	16,00	4,76	8,00	—	○	○	○	○	●
M270BF20	20,00	4,76	10,00	0,10	●	○	○	○	○
M270BF20	20,00	4,76	10,00	—	○	○	○	○	●
M270BF25	25,00	4,76	12,50	0,10	●	○	○	○	○
M270BF25	25,00	4,76	12,50	—	○	○	○	○	●
M270BF32	32,00	4,76	16,00	0,10	●	○	○	○	○
M270BF32	32,00	4,76	16,00	—	○	○	○	○	●

M270 Ball Nose • BR MM



- first choice
- alternate choice

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

catalogue number	W	S	RC	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270BR10	10,00	2,38	5,00	—	●	●	○	○	○
M270BR12	12,00	3,18	6,00	0,08	●	●	○	○	○
M270BR12	12,00	3,18	6,00	—	●	●	○	○	○
M270BR16	16,00	4,76	8,00	0,08	●	●	○	○	○
M270BR16	16,00	4,76	8,00	—	●	●	○	○	○
M270BR20	20,00	4,76	10,00	0,10	●	●	○	○	○
M270BR20	20,00	4,76	10,00	—	●	●	○	○	○
M270BR25	25,00	4,76	12,50	—	●	●	○	○	○
M270BR32	32,00	4,76	16,00	—	●	●	○	○	○

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M270 Ball Nose • B10 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	BF	TN2505	BR	WP35CM	BR	WP35CM
P3-P4	BF	TN2505	BR	WP35CM	BR	WP35CM
P5-P6	BF	TN2505	BR	WP35CM	BR	WP35CM
M1-M2	BR	WP35CM	BR	WP35CM	BR	WP35CM
M3	BR	WP35CM	BR	WP35CM	BR	WP35CM
K1-K2	BF	TN2505	BF	WU10PM	BF	WU10PM
K3	BF	TN2505	BF	WU10PM	BF	WU10PM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	-	-	-	-
S3	-	-	-	-	-	-
S4	-	-	-	-	-	-
H1	BF	TN2505	BF	TN2505	BF	TN2505

M270 Ball Nose • B12 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	BF	TN2505	BR	WP35CM	BR	WP35CM
P3-P4	BF	TN2505	BR	WP35CM	BR	WP35CM
P5-P6	BF	TN2505	BR	WP35CM	BR	WP35CM
M1-M2	BR	WP35CM	BR	WP35CM	BR	WP35CM
M3	BR	WP35CM	BR	WP35CM	BR	WP35CM
K1-K2	BF	TN2505	BF	WU10PM	BF	WU10PM
K3	BF	TN2505	BF	WU10PM	BF	WU10PM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	-	-	-	-
S3	-	-	-	-	-	-
S4	-	-	-	-	-	-
H1	BF	TN2505	BF	TN2505	BF	TN2505

M270 Ball Nose • B16 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	BF	TN6525	BR	TN6540	BR	WP35CM
P3-P4	BF	TN6525	BR	TN6540	BR	WP35CM
P5-P6	BF	TN6525	BR	TN6540	BR	WP35CM
M1-M2	BF	TN6525	BF	TN6525	BR	WP35CM
M3	BF	TN6525	BF	TN6525	BR	WP35CM
K1-K2	BF	TN2505	BF	WU10PM	BF	WU10PM
K3	BF	TN2505	BF	WU10PM	BF	WU10PM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	-	-	-	-
S3	-	-	-	-	-	-
S4	BF	TN2505	-	-	-	-
H1	BF	TN2505	BF	TN2505	BF	TN2505

M270 Ball Nose • B20 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	BR	TN6540	BF	TN6540	BF	TN6540
P3-P4	BR	TN6540	BF	TN6540	BR	WP35CM
P5-P6	BR	TN6540	BR	WP35CM	BR	WP35CM
M1-M2	BR	TN6540	BR	TN6540	BR	TN6540
M3	BR	TN6540	BR	TN6540	BR	TN6540
K1-K2	BR	TN2505	BR	TN2505	-	-
K3	BR	TN2505	BR	TN2505	-	-
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	-	-	BR	TN6540	-	-
S3	-	-	BR	TN6540	-	-
S4	-	-	BR	TN6540	-	-
H1	-	-	BR	TN2505	-	-

M270 Ball Nose • B25 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	BR	WP35CM	BR	WP35CM	BR	WP35CM
P3-P4	BR	WP35CM	BR	WP35CM	BR	WP35CM
P5-P6	BR	WP35CM	BR	WP35CM	BR	WP35CM
M1-M2	BR	WP35CM	BR	WP35CM	BR	WP35CM
M3	BR	WP35CM	BR	WP35CM	BR	WP35CM
K1-K2	BF	TN2505	BF	TN2505	BF	TN2505
K3	BF	TN2505	BF	TN2505	BF	TN2505
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	BR	WP35CM	-	-	-	-
S3	BR	WP35CM	-	-	-	-
S4	BF	TN2505	BR	WP35CM	-	-
H1	BF	TN2505	BR	WP35CM	BR	WP35CM

M270 Ball Nose • B32 • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	BR	WP35CM	BR	WP35CM	BR	WP35CM
P3-P4	BR	WP35CM	BR	WP35CM	BR	WP35CM
P5-P6	BR	WP35CM	BR	WP35CM	BR	WP35CM
M1-M2	BR	WP35CM	BR	WP35CM	BR	WP35CM
M3	BR	WP35CM	BR	WP35CM	BR	WP35CM
K1-K2	BF	TN2505	BF	TN2505	BF	TN2505
K3	BF	TN2505	BF	TN2505	BF	TN2505
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	BR	WP35CM	-	-	-	-
S3	BR	WP35CM	-	-	-	-
S4	BR	WP35CM	BR	WP35CM	-	-
H1	BF	TN2505	BF	TN2505	BF	TN2505

M270 Ball Nose • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540			WP35CM			WU10PM		
P	1	550	420	360	410	320	280	360	280	240	455	395	370	-	-	-
	2	320	240	205	320	250	215	250	190	170	280	255	230	-	-	-
	3	320	240	205	280	215	185	215	170	140	255	230	205	-	-	-
	4	-	-	-	235	170	145	180	130	110	190	175	160	-	-	-
	5	-	-	-	310	235	200	240	180	150	260	230	210	-	-	-
	6	-	-	-	205	160	130	160	120	100	160	135	110	-	-	-
M	1	-	-	-	190	120	80	130	80	60	205	185	155	-	-	-
	2	-	-	-	120	80	50	80	50	40	185	160	140	-	-	-
	3	-	-	-	125	80	55	85	50	40	145	130	115	-	-	-
K	1	400	300	250	275	245	220	220	205	180	295	265	240	295	265	240
	2	540	365	280	215	190	180	175	155	140	235	210	190	230	205	190
	3	310	190	155	180	160	145	155	145	125	195	175	160	195	175	160
N	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-
	4	-	-	-	-	-	-	60	30	25	66	50	33	-	-	-
H	1	175	140	95	-	-	-	-	-	-	-	-	-	160	130	90
	2	175	140	95	-	-	-	-	-	-	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-	-	-	-	-	-	-

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

M270 Ball Nose • B10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 4,76mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,12	0,23	0,42	0,08	0,16	0,29	0,06	0,12	0,21	0,05	0,10	0,18	0,05	0,10	0,17	BF
BR	0,19	0,29	0,51	0,14	0,20	0,35	0,10	0,15	0,25	0,09	0,13	0,22	0,08	0,12	0,20	BR

At 2,38mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,14	0,27	0,49	0,10	0,19	0,34	0,07	0,14	0,25	0,06	0,12	0,21	0,06	0,11	0,19	BF
BR	0,22	0,34	0,61	0,16	0,24	0,40	0,12	0,17	0,29	0,10	0,15	0,25	0,09	0,14	0,23	BR

At 1,19mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,18	0,36	0,68	0,13	0,25	0,45	0,09	0,18	0,32	0,08	0,16	0,28	0,08	0,15	0,25	BF
BR	0,29	0,46	0,84	0,21	0,31	0,54	0,15	0,23	0,39	0,13	0,20	0,33	0,12	0,18	0,30	BR

At 0,60mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,25	0,51	1,02	0,18	0,34	0,63	0,13	0,25	0,44	0,11	0,22	0,38	0,10	0,20	0,35	BF
BR	0,41	0,66	1,34	0,28	0,44	0,76	0,21	0,31	0,53	0,18	0,27	0,45	0,17	0,25	0,41	BR

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

M270 Ball Nose • B12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BR	0,13	0,29	0,43	0,09	0,20	0,30	0,07	0,15	0,22	0,06	0,13	0,19	0,06	0,12	0,18	BR
BF	0,21	0,39	0,58	0,15	0,27	0,40	0,11	0,20	0,29	0,10	0,18	0,25	0,09	0,16	0,23	BF

At 2,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BR	0,15	0,33	0,50	0,11	0,24	0,35	0,08	0,17	0,26	0,07	0,15	0,22	0,06	0,14	0,20	BR
BF	0,24	0,46	0,69	0,17	0,32	0,47	0,13	0,23	0,34	0,11	0,20	0,29	0,10	0,18	0,27	BF

At 1,25mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BR	0,20	0,45	0,68	0,14	0,31	0,46	0,11	0,23	0,34	0,09	0,20	0,29	0,08	0,18	0,27	BR
BF	0,32	0,61	0,94	0,23	0,42	0,62	0,17	0,31	0,45	0,15	0,26	0,38	0,13	0,24	0,35	BF

At 0,63mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BR	0,28	0,63	0,99	0,20	0,43	0,64	0,15	0,31	0,46	0,13	0,27	0,40	0,12	0,25	0,36	BR
BF	0,45	0,89	1,42	0,31	0,58	0,87	0,23	0,42	0,61	0,20	0,36	0,53	0,18	0,33	0,48	BF

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

M270 Ball Nose • B16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,14	0,28	0,45	0,10	0,20	0,31	0,08	0,15	0,23	0,07	0,13	0,20	0,06	0,12	0,18	BF
BR	0,21	0,38	0,59	0,15	0,27	0,41	0,11	0,20	0,30	0,10	0,17	0,26	0,09	0,16	0,24	BR

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,16	0,33	0,52	0,12	0,23	0,36	0,09	0,17	0,27	0,08	0,15	0,23	0,07	0,14	0,21	BF
BR	0,24	0,45	0,69	0,17	0,31	0,48	0,13	0,23	0,35	0,11	0,20	0,30	0,10	0,18	0,28	BR

At 2,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,21	0,44	0,70	0,15	0,31	0,48	0,11	0,23	0,35	0,10	0,20	0,30	0,09	0,18	0,28	BF
BR	0,32	0,60	0,94	0,23	0,42	0,63	0,17	0,31	0,46	0,15	0,26	0,40	0,13	0,24	0,36	BR

At 1,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,29	0,61	0,99	0,21	0,43	0,66	0,16	0,31	0,48	0,14	0,27	0,42	0,12	0,25	0,38	BF
BR	0,44	0,85	1,38	0,31	0,57	0,88	0,23	0,42	0,63	0,20	0,36	0,54	0,18	0,33	0,50	BR

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

M270 Ball Nose • B20 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 10,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,19	0,24	0,40	0,13	0,17	0,28	0,10	0,13	0,21	0,09	0,11	0,18	0,08	0,10	0,17	BF
BR	0,24	0,38	0,65	0,17	0,27	0,46	0,13	0,20	0,34	0,11	0,17	0,30	0,10	0,16	0,27	BR

At 5,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,22	0,28	0,46	0,15	0,20	0,33	0,12	0,15	0,24	0,10	0,13	0,21	0,09	0,12	0,19	BF
BR	0,27	0,44	0,76	0,20	0,31	0,53	0,15	0,23	0,39	0,13	0,20	0,34	0,12	0,18	0,31	BR

At 2,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,28	0,37	0,61	0,20	0,27	0,43	0,15	0,20	0,32	0,13	0,17	0,28	0,12	0,16	0,25	BF
BR	0,36	0,58	1,01	0,26	0,41	0,70	0,19	0,30	0,52	0,17	0,26	0,45	0,15	0,24	0,41	BR

At 1,25mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,39	0,51	0,85	0,28	0,36	0,59	0,21	0,27	0,44	0,18	0,23	0,38	0,17	0,21	0,35	BF
BR	0,50	0,81	1,44	0,36	0,56	0,97	0,26	0,42	0,71	0,23	0,36	0,61	0,21	0,33	0,56	BR

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

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M270 Ball Nose • B25 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 12,50mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,17	0,31	0,50	0,13	0,22	0,36	0,09	0,16	0,26	0,08	0,14	0,23	0,08	0,13	0,21	BF
BR	0,24	0,38	0,65	0,17	0,27	0,46	0,13	0,20	0,34	0,11	0,17	0,30	0,10	0,16	0,27	BR

At 6,25mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,20	0,35	0,58	0,15	0,25	0,41	0,11	0,19	0,30	0,09	0,16	0,27	0,09	0,15	0,24	BF
BR	0,27	0,44	0,76	0,20	0,31	0,53	0,15	0,23	0,39	0,13	0,20	0,34	0,12	0,18	0,31	BR

At 3,13mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,27	0,47	0,77	0,19	0,33	0,54	0,14	0,25	0,40	0,12	0,21	0,35	0,11	0,20	0,32	BF
BR	0,36	0,58	1,02	0,26	0,41	0,70	0,19	0,30	0,52	0,17	0,26	0,45	0,15	0,24	0,41	BR

At 1,56mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,37	0,65	1,09	0,26	0,46	0,75	0,19	0,34	0,55	0,17	0,29	0,47	0,15	0,27	0,43	BF
BR	0,50	0,81	1,44	0,36	0,56	0,97	0,26	0,42	0,71	0,23	0,36	0,61	0,21	0,33	0,56	BR

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

M270 Ball Nose • B32 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 16,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,17	0,30	0,47	0,13	0,22	0,34	0,09	0,16	0,25	0,08	0,14	0,22	0,08	0,13	0,20	BF
BR	0,23	0,38	0,59	0,17	0,27	0,42	0,13	0,20	0,31	0,11	0,17	0,27	0,10	0,16	0,25	BR

At 8,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,20	0,35	0,55	0,15	0,25	0,39	0,11	0,19	0,29	0,09	0,16	0,25	0,09	0,15	0,23	BF
BR	0,27	0,43	0,69	0,19	0,31	0,49	0,14	0,23	0,36	0,13	0,20	0,32	0,12	0,18	0,29	BR

At 4,00mm Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,26	0,46	0,72	0,19	0,33	0,51	0,14	0,25	0,38	0,12	0,21	0,33	0,11	0,20	0,30	BF
BR	0,35	0,57	0,92	0,25	0,41	0,64	0,19	0,30	0,48	0,17	0,26	0,41	0,15	0,24	0,38	BR

At 2,00mm Axial Depth of Cut (ap)

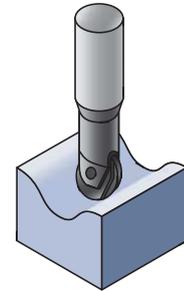
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
BF	0,36	0,64	1,01	0,26	0,45	0,71	0,19	0,34	0,52	0,17	0,29	0,45	0,15	0,27	0,41	BF
BR	0,49	0,80	1,28	0,35	0,56	0,89	0,26	0,42	0,65	0,23	0,36	0,57	0,21	0,33	0,52	BR

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

Selecting the Correct Insert and Cutting Conditions for Your Application

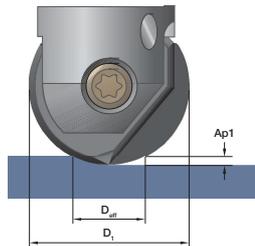
1. Insert Style: Considerations for Selecting the Correct Insert

Best Choices for Insert and Grade Selection ● First choice ○ Alternate choice	BR Geometry		BF Geometry
			
Grade	WP35CM	WU10PM	TN2505
Roughing Operation	●	○	
Finishing Operation		○	●
Low RPM Machine	●	○	
Flat Areas or Face Milling (≤10° inclination)	●	○	
Hard Machining		○	●
Unstable and/or Long Overhangs	●	○	
HSM or 5-Axis Machining (smaller ap/ae values)	●	○	

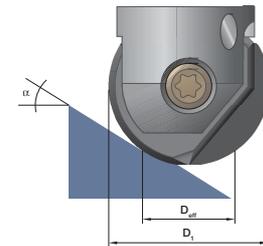


2. Calculating effective diameter and resulting surface speed

It is important to consider the effective diameter (Deff) when using light depths of cut in order to properly calculate RPM values. Use the following formula when machining flat surfaces or inclinations of 10° or less to find the Deff value, and then use this for RPM calculations as opposed to using the overall insert diameter (D1).



When machining inclinations between 11° and 55°, further modification of vc is required. Apply factor “k” from the given formula to calculate the correct vc (vceff). This corrected value is then used to calculate the proper RPM for the tool.



$$D_{eff} = \sqrt{D1^2 - (D1 - 2Ap1)^2}$$

Deff

$$k = \frac{1}{\sin [\alpha + \arccos (1 - (2 (Ap1/D1)))]}$$

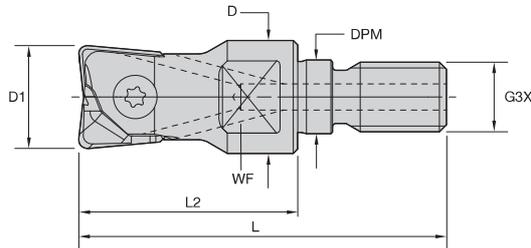
$$v_{c\text{eff}} = v_c \times k$$

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)	ap1	max rec. (mm)	fz (mm/tooth)	ap1	max rec. (mm)	fz (mm/tooth)	ap1	max rec. (mm)	fz (mm/tooth)	ap1	max rec. (mm)	fz (mm/tooth)	ap1	max rec. (mm)	fz (mm/tooth)	ap1
Soft Steel <250 HB	0,7	0,7	0,2	0,8	0,8	0,2	1,1	1,1	0,27	1,3	1,3	0,27	1,7	1,7	0,3	2,1	2,1	0,3
High-Strength Steel 33-44 HRC	0,5	0,5	0,15	0,6	0,6	0,2	0,8	0,8	0,25	1	1	0,25	1,3	1,3	0,25	1,6	1,6	0,25
Hardened Steel 44-55 HRC	0,3	0,3	0,15	0,4	0,4	0,2	0,5	0,5	0,22	0,7	0,7	0,22	0,8	0,8	0,25	1,1	1,1	0,25
Gray Cast Iron GG25...	1	1	0,2	1,2	1,2	0,25	1,6	1,6	0,25	2	2	0,25	2,5	2,5	0,3	3,2	3,2	0,3
Nodular Cast Iron GGG60...	0,7	0,7	0,2	0,8	0,8	0,25	1,1	1,1	0,25	1,3	1,3	0,25	1,7	1,7	0,3	2,1	2,1	0,3

M270 Toroidal • Screw-On • Metric



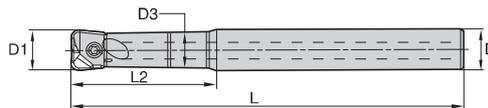
order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Z	Z U	inserts	max RPM	coolant supply	kg
3926546	M270TD012M08	12	13	8,5	M8	42	25	10	1	2	M270TF12R..	55000	Yes	0,02
3926547	M270TD016M08	16	13	8,5	M8	47	30	10	1	2	M270TF16R..	53000	Yes	0,09
3926548	M270TD020M10	20	18	10,5	M10	59	40	14	1	2	M270TF20R..	52000	Yes	0,07

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 Toroidal • Cylindrical Shank • Metric



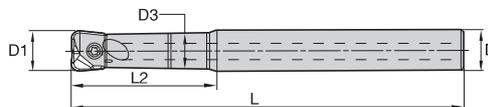
order number	catalogue number	D1	D	D3	L	L2	Z	Z U	inserts	max RPM	coolant supply	kg
3926514	M270TD010A10L120	10	10	9	120	45	1	2	M270TF10R..	57000	Yes	0,06
3926515	M270TD012A12L140	12	12	11	140	50	1	2	M270TF12R..	55000	Yes	0,09
3926516	M270TD016A16L160	16	16	14	160	57	1	2	M270TF16R..	53000	Yes	0,19
3926517	M270TD020A20L180	20	20	18	180	70	1	2	M270TF20R..	52000	Yes	0,35

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 Toroidal • Carbide Cylindrical Shank • Metric



order number	catalogue number	D1	D	D3	L	L2	Z	Z U	inserts	max RPM	coolant supply	kg
3926518	M270TD010A10L120C	10	10	9	120	45	1	2	M270TF10R..	57000	Yes	0,11
3926519	M270TD010A10L150C	10	10	9	150	45	1	2	M270TF10R..	57000	Yes	0,14
3926520	M270TD012A12L120C	12	12	11	120	50	1	2	M270TF12R..	55000	Yes	0,15
3926521	M270TD012A12L160C	12	12	11	160	50	1	2	M270TF12R..	55000	Yes	0,22
3926522	M270TD016A16L140C	16	16	14	140	57	1	2	M270TF16R..	53000	Yes	0,32
3926543	M270TD016A16L180C	16	16	14	180	57	1	2	M270TF16R..	53000	Yes	0,44
3926544	M270TD020A20L150C	20	20	18	150	70	1	2	M270TF20R..	52000	Yes	0,52
3926545	M270TD020A20L200C	20	20	18	200	70	1	2	M270TF20R..	52000	Yes	0,74

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

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

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

INDEXABLE MILLING

SOLID END MILLING

HOLE/REAMING

TAPPING

TURNING

M270 Toroidal • TF



- first choice
- alternate choice

P	Blue	Yellow	White	Black	Black	Black	Black
M	Blue	Yellow	White	Black	Black	Black	Black
K	Red	Black	White	Black	Black	Black	Black
N	Green	Black	White	Black	Black	Black	Black
S	Orange	Black	White	Black	Black	Black	Black
H	Grey	Black	White	Black	Black	Black	Black

catalogue number	W	S	RR	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270TF10R05	10,00	2,38	0,50	—	●	●	●	●	●
M270TF10R1	10,00	2,38	1,00	0,08	○	○	○	○	○
M270TF12R05	12,00	3,18	0,50	—	●	●	●	●	●
M270TF12R1	12,00	3,18	1,01	—	○	○	○	○	○
M270TF12R2	12,00	3,18	2,01	0,08	○	○	○	○	○
M270TF16R05	16,00	4,76	0,50	—	●	●	●	●	●
M270TF16R1	16,00	4,76	1,01	—	○	○	○	○	○
M270TF20R05	20,00	4,76	0,50	—	●	●	●	●	●

M270 Toroidal • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	TF	WU10PM	TF	WU10PM	TF	WU10PM
P3-P4	TF	WU10PM	TF	WU10PM	TF	WU10PM
P5-P6	TF	WU10PM	TF	WU10PM	-	-
M1-M2	TF	WU10PM	-	-	-	-
M3	TF	WU10PM	-	-	-	-
K1-K2	TF	WU10PM	TF	WU10PM	-	-
K3	TF	WU10PM	TF	WU10PM	-	-
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	TF	WU10PM	-	-	-	-
S3	TF	WU10PM	-	-	-	-
S4	TF	WU10PM	-	-	-	-
H1	TF	TN2505	TF	WU10PM	-	-

M270 Toroidal • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540			WP35CM			WU10PM			
P	1	550	420	360	410	320	280	360	280	240	455	395	370	-	-	-	-
	2	320	240	205	320	250	215	250	190	170	280	255	230	-	-	-	-
	3	320	240	205	280	215	185	215	170	140	255	230	205	-	-	-	-
	4	-	-	-	235	170	145	180	130	110	190	175	160	-	-	-	-
	5	-	-	-	310	235	200	240	180	150	260	230	210	-	-	-	-
	6	-	-	-	205	160	130	160	120	100	160	135	110	-	-	-	-
M	1	-	-	-	190	120	80	130	80	60	205	185	155	-	-	-	-
	2	-	-	-	120	80	50	80	50	40	185	160	140	-	-	-	-
	3	-	-	-	125	80	55	85	50	40	145	130	115	-	-	-	-
K	1	400	300	250	275	245	220	220	205	180	295	265	240	295	265	240	-
	2	540	365	280	215	190	180	175	155	140	235	210	190	230	205	190	-
	3	310	190	155	180	160	145	155	145	125	195	175	160	195	175	160	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	60	30	25	66	50	33	-	-	-	-
H	1	175	140	95	-	-	-	-	-	-	-	-	-	160	130	90	-
	2	175	140	95	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-	-	-	-	-	-	-	-

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

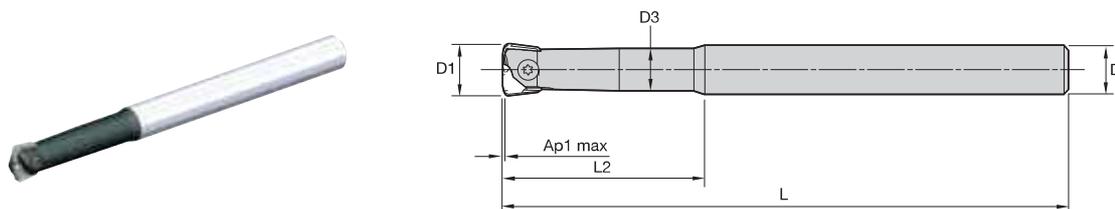
M270 Toroidal • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															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.

M270 High Feed • Cylindrical Shank • Metric



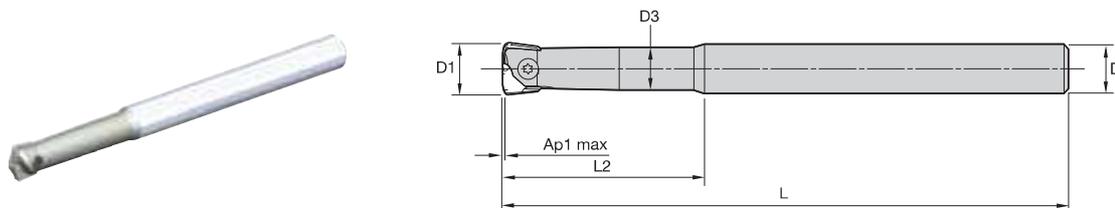
order number	catalogue number	D1	D	D3	L	L2	Ap1 max	Z	Z U	insert 1	max RPM	coolant supply	kg
3926514	M270TD010A10L120	10	10	9	120	45	0,6	1	2	M270HF10	57000	Yes	0,06
3926515	M270TD012A12L140	12	12	11	140	50	0,6	1	2	M270HF12	55000	Yes	0,09
3926516	M270TD016A16L160	16	16	14	160	57	0,9	1	2	M270HF16	53000	Yes	0,19

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 High Feed • Carbide Cylindrical Shank • Metric



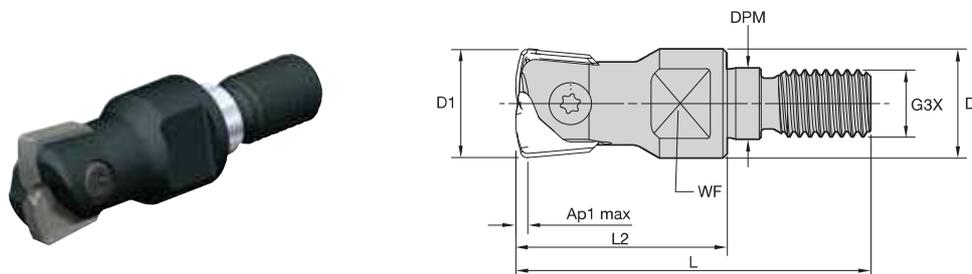
order number	catalogue number	D1	D	D3	L	L2	Ap1 max	Z	Z U	insert 1	max RPM	coolant supply	kg
3926518	M270TD010A10L120C	10	10	9	120	45	0,6	1	2	M270HF10	57000	Yes	0,11
3926519	M270TD010A10L150C	10	10	9	150	45	0,6	1	2	M270HF10	57000	Yes	0,14
3926520	M270TD012A12L120C	12	12	11	120	50	0,6	1	2	M270HF12	55000	Yes	0,15
3926521	M270TD012A12L160C	12	12	11	160	50	0,6	1	2	M270HF12	55000	Yes	0,22
3926522	M270TD016A16L140C	16	16	14	140	57	0,9	1	2	M270HF16	53000	Yes	0,32
3926543	M270TD016A16L180C	16	16	14	180	57	0,9	1	2	M270HF16	53000	Yes	0,44

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 High Feed • Toroidal • Screw-On • Metric



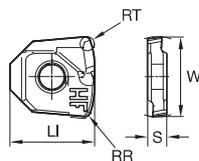
order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	Z U	insert 1	max RPM	coolant supply	kg
3926546	M270TD012M08	12	13	8,5	M8	42	25	10	0,6	1	2	M270HF12	55000	Yes	0,02
3926547	M270TD016M08	16	13	8,5	M8	47	30	10	0,9	1	2	M270HF16	53000	Yes	0,09

NOTE: ZU = Effective teeth.

Z = number of pocket seats.

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

M270 High Feed • HF



- first choice
- alternate choice

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

catalogue number	W	LI	S	RR	RT	hm	TN2505	TN6525	TN6540	WP35CM	WU10PM
M270HF10	10,00	10,50	2,38	0,63	1,15	0,08	●	○	○	○	○
M270HF12	12,00	12,40	3,18	0,75	1,40	0,08	○	○	○	○	○
M270HF16	16,00	16,70	4,76	1,00	1,90	0,08	○	○	○	○	○

M270 High Feed • Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	HF	TN6525	HF	TN6540	HF	TN6540
P3-P4	HF	TN6525	HF	TN6540	HF	TN6540
P5-P6	HF	TN6525	HF	TN6540	HF	TN6540
M1-M2	HF	TN6525	HF	TN6540	HF	TN6540
M3	HF	TN6525	HF	TN6540	HF	TN6540
K1-K2	HF	TN2505	HF	TN6525	-	-
K3	HF	TN2505	HF	TN6525	-	-
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	HF	TN6525	HF	TN6540	-	-
S3	HF	TN6525	HF	TN6540	-	-
S4	HF	TN6525	HF	TN6540	HF	TN6540
H1	HF	TN2505	HF	TN2505	HF	TN6525

FOR SPARE PARTS, PLEASE VISIT WIDIA.COM OR WIDIANOVO.COM.
MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

M270 High Feed • Recommended Starting Speeds [m/min]

Material Group		TN2505			TN6525			TN6540			WP35CM			WU10PM		
P	1	550	420	360	410	320	280	360	280	240	455	395	370	-	-	-
	2	320	240	205	320	250	215	250	190	170	280	255	230	-	-	-
	3	320	240	205	280	215	185	215	170	140	255	230	205	-	-	-
	4	-	-	-	235	170	145	180	130	110	190	175	160	-	-	-
	5	-	-	-	310	235	200	240	180	150	260	230	210	-	-	-
	6	-	-	-	205	160	130	160	120	100	160	135	110	-	-	-
M	1	-	-	-	190	120	80	130	80	60	205	185	155	-	-	-
	2	-	-	-	120	80	50	80	50	40	185	160	140	-	-	-
	3	-	-	-	125	80	55	85	50	40	145	130	115	-	-	-
K	1	400	300	250	275	245	220	220	205	180	295	265	240	295	265	240
	2	540	365	280	215	190	180	175	155	140	235	210	190	230	205	190
	3	310	190	155	180	160	145	155	145	125	195	175	160	195	175	160
N	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	50	35	30	-	-	-	-	-	-
	2	-	-	-	-	-	-	25	20	10	-	-	-	-	-	-
	3	-	-	-	-	-	-	70	40	30	-	-	-	-	-	-
	4	-	-	-	-	-	-	60	30	25	66	50	33	-	-	-
H	1	175	140	95	-	-	-	-	-	-	-	-	-	160	130	90
	2	175	140	95	-	-	-	-	-	-	-	-	-	-	-	-
	3	140	115	80	-	-	-	-	-	-	-	-	-	-	-	-

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

M270 High Feed • HF10 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
HF	1,01	1,57	-	0,67	0,97	1,41	0,48	0,69	0,97	0,42	0,59	0,83	0,38	0,54	0,75	HF

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

M270 High Feed • HF12 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
HF	0,91	1,53	2,81	0,61	0,96	1,43	0,45	0,69	0,99	0,39	0,59	0,85	0,35	0,54	0,77	HF

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

M270 High Feed • HF16 • Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	5%			10%			20%			30%			40-100%			
HF	1,03	1,60	3,34	0,69	1,00	1,50	0,50	0,71	1,03	0,43	0,61	0,88	0,39	0,56	0,80	HF

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

INDEXABLE MILLING

SOLID END MILLING

HOLEMAKING

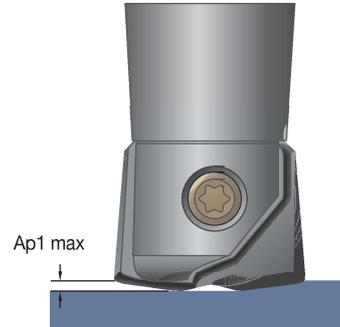
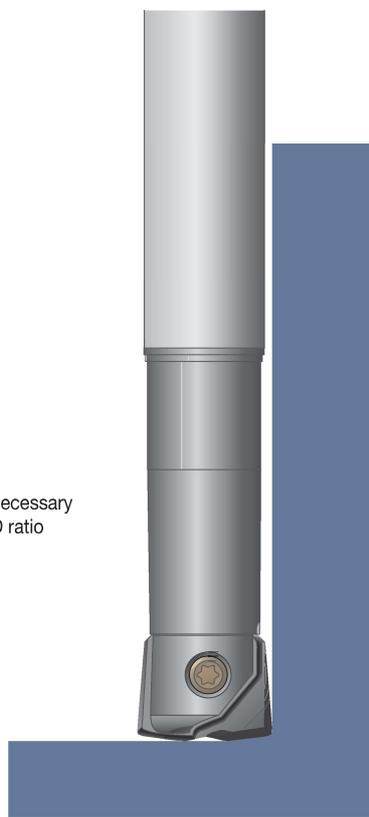
TAPPING

TURNING

Applying High-Feed Tools

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

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



Small Ap1 values and higher feed rate generate lower cutting forces versus traditional milling strategies.



For CAM programming, the tools can be programmed as a toroidal tool type by using the Rt value as the insert radius.

L/D ratio	% of Ap1 max to reduce	% of vc to reduce
<4	0%	0%
4<L/D<7	55-65%	10-15%
>8	65-75%	20-30%

General Programming Information for Applying M270 High Feed

tool diameter	Ø10	Ø12	Ø13	Ø16	Ø17	Ø20
recommended starting Ap1 (mm)	0,40	0,40	0,40	0,60	0,60	0,75
Rt CAM programming	1,15	1,40	1,40	1,90	1,90	2,30
fz recommended for general purpose	0,45	0,55	0,55	0,60	0,60	0,70
fz recommended for 45 HRC (approx.)	0,40	0,45	0,45	0,55	0,55	0,65
fz recommended for 55 HRC (approx.)	0,30	0,35	0,35	0,45	0,45	0,50

NOTE: Use two effective teeth for feed calculations.

For materials above 45 HRC, we recommend adjusting the ae max to 55% of cutting diameter and using no more than 50% of Ap1 max.

While center cutting is possible, we recommend using a ramp angle of 0.5°-1.0° to ensure smooth operation.

General Milling and ISO Inserts

Additional Inserts

Use general milling and ISO inserts in the latest WIDIA™ grades as an economical solution for improved productivity in face milling, shoulder milling, and copy milling applications.

Inserts offered in pressed and sintered to size (PSTS) and ground versions for economical and precise solutions.

Available in the latest Victory™ grades: WK15CM, WP35CM, and WU20PM.

Inserts can be used in existing tool bodies for lower tooling costs.

Materials include all types of steel, stainless steel, cast iron, and nodular iron.



The general milling and ISO inserts are cost-effective inserts that provide higher performance for applications in automotive, heavy equipment, railroad components, and general engineering parts.

WK15CM



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

WP35CM



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

WU20PM



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

HIGHER PERFORMANCE AT LOWER COST

PRODUCT

SERIES
General Milling/
ISO Inserts

INDUSTRY



APPLICATIONS



FACE
MILLING



SIDE MILLING/
SHOULDER
MILLING

PERFORMANCE

Using proven WIDIA™ grades, improve productivity in all types of steel, stainless steel, cast iron, and nodular iron workpiece materials.

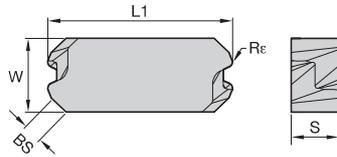
COST EFFECTIVE

Inserts can be used in existing cutter bodies reducing tooling costs.



INDEXABLE MILLING

Indexable Milling • Face Milling ISO Inserts • LNCX



- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

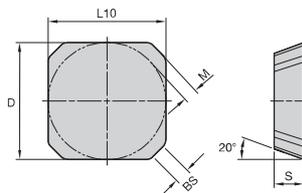
SOLID END MILLING

ISO catalogue number	cutting edges	W	S	BS	R ϵ	hm	WP35CM	WK15CM
LNCX1806AZR11	4	10,00	6,40	2,16	0,75	0,05	●	5343199
LNCX1806AZR11	4	10,00	6,40	2,16	0,75	0,06	○	6852433

HOLEMAKING

TAPPING

Indexable Milling • Face Milling ISO Inserts • SEAN-1 • SE1203..



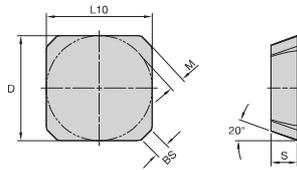
- first choice
- alternate choice

P	●
M	○
K	○
N	○
S	○
H	○

TURNING

catalogue number	cutting edges	D	L10	M	S	BS	hm	TT125	THM
SEAN1203AFN1	4	12,70	12,70	1,66	3,18	1,65	0,10	●	2028344
SEAN1203AFN	4	12,70	12,70	1,43	3,18	1,57	0,02	○	6870582

Indexable Milling • Face Milling ISO Inserts • SEKN-1 • SE1203..



- first choice
- alternate choice

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

catalogue number	cutting edges	D	L10	M	S	BS	hm	TN6540	TTI25	THM	WP35CM	WK15CM
SEKN1203AFN1	4	12,70	12,70	1,66	3,18	1,65	0,14	3065464	2028349	2028350	6923425	5427318
SEKN1203AFN1	4	12,70	12,70	1,66	3,18	1,65	—	—	—	—	—	—
SEKN1203AFN	4	12,70	12,70	1,66	3,18	1,65	0,02	—	—	2562668	—	—
SEKN1203AFN	4	12,70	12,70	1,66	3,18	1,65	0,05	—	—	—	6877205	—

INDEXABLE MILLING

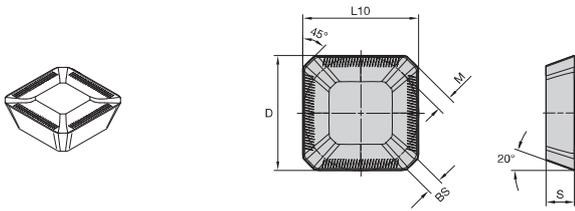
SOLID END MILLING

HOLEMAKING

TAPPING

TURNING

Indexable Milling • Face Milling ISO Inserts • SEKR-MS • SE1203....

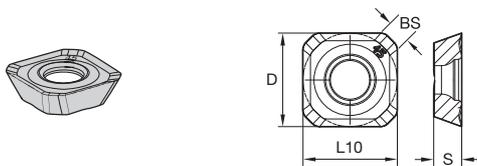


- first choice
- alternate choice

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

catalogue number	cutting edges	D	L10	M	S	BS	hm	THR	WU20PM	WP35CM
SEKR1203AFNMS	4	12,70	12,70	1,66	3,10	1,65	0,14	2012927	●	●
SEKR1203AFNMS	4	12,70	12,70	1,66	3,10	1,65	0,04	●	●	6901194
SEKR1203AFNMS	4	12,70	12,70	1,66	3,10	1,65	0,05	●	2415793	●
SEKR1204AFNMS	4	12,70	12,70	1,66	4,76	1,65	—	●	●	6856937
SEKR1504AFNMS	4	15,88	15,88	2,25	4,76	1,90	0,13	●	●	6901200

Indexable Milling • Face Milling ISO Inserts • SEPT



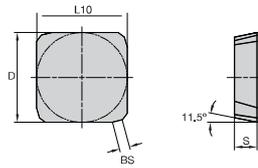
- first choice
- alternate choice

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

catalogue number	cutting edges	D	L10	S	BS	TN6525	TN6540
SEPT13T3AGENMM	4	13,41	13,41	3,96	2,50	4072174	4072175

INDEXABLE MILLING

Indexable Milling • Face Milling ISO Inserts • SPAN



- first choice
- alternate choice

P	●	●
M	●	●
K	○	○
N	○	○
S	○	○
H	○	○

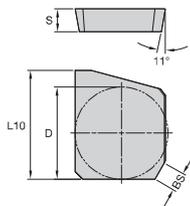
SOLID END MILLING

ISO catalogue number	cutting edges	D	L10	S	BS	hm	WP-35CM	WU20PM
SPAN1203EDL	4	13	12,70	3,18	1,03	0,05	9997503	
SPAN1203EDR	4	13	12,70	3,18	1,03	0,05	6877203	
SPAN1203EDR	4	13	12,70	3,18	1,03	0,06	2557457	

HOLEMAKING

TAPPING

Indexable Milling • Face Milling ISO Inserts • SPCX



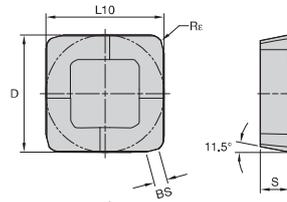
- first choice
- alternate choice

P	●	
M	●	
K	○	
N	○	
S	○	
H	○	

TURNING

ISO catalogue number	cutting edges	D	L10	S	hm	THM-F
SPCX1203EDL	1	13	15,00	3,18	0,02	2557024
SPCX1203EDR	1	13	15,00	3,18	0,02	2557061

Indexable Milling • Face Milling ISO Inserts • SPKR

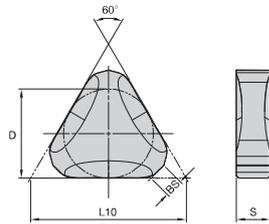


- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D	L10	S	BS	R ϵ	hm	WU20PM
SPKR1203EDLMS	4	13	12,70	3,18	1,40	1,60	0,05	2556319
SPKR1203EDRMS	4	13	12,70	3,18	1,40	1,60	0,05	2561005

Indexable Milling • Face Milling ISO Inserts • TNHF

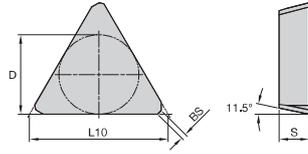


- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D	L10	S	BS	hm	WK15CM
TNHF1204ANCA	6	13	22,00	4,76	2,58	0,05	6008686

Indexable Milling • Face Milling ISO Inserts • TPAN

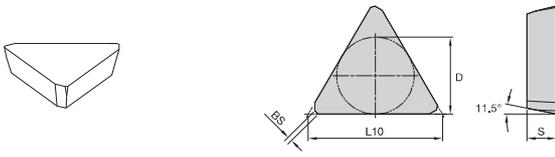


- first choice
- alternate choice

P	●	●
M	●	●
K	○	○
N	○	○
S	○	○
H	○	○

ISO catalogue number	cutting edges	D	L10	S	BS	hm	WP35CM	WU20PM
TPAN1103PPN	3	6	10,96	3,18	0,71	0,04	6877241	2557715
TPAN1603PDR	3	10	16,45	3,18	0,03	0,05	6877242	2568655
TPAN1603PPN	3	10	16,45	3,18	1,17	0,05	6877204	2557665
TPAN2204PPN	3	13	21,96	4,76	1,24	0,06	6877210	6869240
TPAN2204PDR	3	13	21,96	4,76	1,35	0,06	6801236	-
TPAN2204PDR	3	13	21,96	4,76	1,35	0,07	-	2557789
TPAN22T3AER	3	13	22,49	3,97	2,11	0,06	6877243	-

Indexable Milling • Face Milling ISO Inserts • TPKN



- first choice
- alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	R _ε	hm	WP35CM	WK15CM	WU20PM
TPKN1603PDR	3	10	16,45	3,18	1,29	—	0,05	—	—	3665253
TPKN1603PPN	3	10	16,50	3,18	1,20	—	0,05	6877208	—	—
TPKN1603PDR	3	10	16,50	3,18	1,22	1,10	0,13	6901195	—	—
TPKN2204PDL	3	13	21,95	4,76	0,72	—	0,05	—	—	2557538
TPKN2204PDR	3	13	21,95	4,76	0,72	—	0,05	—	—	2557571
TPKN2204PDR	3	13	21,95	4,76	0,72	—	0,06	6873002	—	—
TPKN2204PDL	3	13	21,95	4,76	0,72	—	0,06	6877209	—	—
TPKN2204PDR	3	13	21,95	4,76	0,72	—	0,18	—	5427377	—

INDEXABLE MILLING

SOLID END MILLING

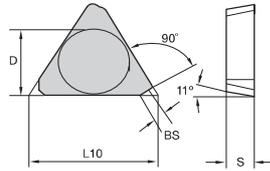
HOLEMAKING

TAPPING

TURNING

INDEXABLE MILLING

Indexable Milling • Face Milling ISO Inserts • TPKR-MS



- first choice
- alternate choice

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

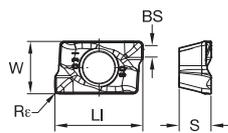
ISO catalogue number	cutting edges	D	L10	S	BS	hm	THM	TTM08	WP35CM	WU20PM
TPKR1603PDRMS	3	10	16,50	3,18	1,40	0,04	5107759	-	6901196	-
TPKR1603PDRMS	3	10	16,50	3,18	1,40	0,05	-	-	-	4120195
TPKR1603PDRMS	3	10	16,50	3,18	1,40	0,10	2014835	-	-	-

SOLID END MILLING

HOLEMAKING

TAPPING

Indexable Milling • Shoulder Milling ISO Inserts • ADPT



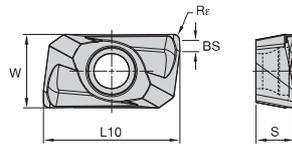
- first choice
- alternate choice

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

catalogue number	cutting edges	W	LI	S	BS	Re	TTN6540
ADPT150508ERMM	2	9,65	16,12	5,84	2,13	0,79	4071302

TURNING

Indexable Milling • Shoulder Milling ISO Inserts • APMT

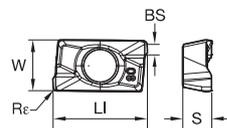


- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○
	○

ISO catalogue number	cutting edges	L10	W	S	BS	Rε	hm	WU20PM
APMT1135PDR	2	11,20	5,95	3,50	—	0,80	0,05	6196890
APMT1604PDR	2	17,00	9,24	4,76	1,38	0,80	0,05	6196891

Indexable Milling • Shoulder Milling ISO Inserts • APPT



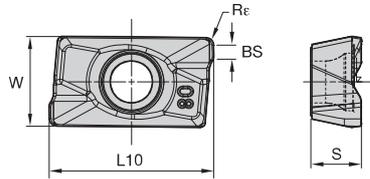
- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	●
H	○
	○

catalogue number	cutting edges	W	LI	S	BS	Rε	TN6540
APPT160408PDERMM	2	9,43	17,24	5,26	1,47	0,79	4071254
APPT160408PDSRMM	2	9,41	17,20	5,26	1,49	0,79	4071257
APPT160416PDERMM	2	9,43	17,22	5,27	1,43	1,59	4071259
APPT160432PDERMM	2	9,44	16,87	5,26	—	3,18	4071265

INDEXABLE MILLING

Indexable Milling • Shoulder Milling ISO Inserts • APPT-MM



- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

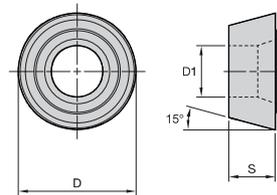
SOLID END MILLING

ISO catalogue number	cutting edges	L10	W	S	BS	R ϵ	hm	
APPT100308PDSRMM	2	11,10	6,70	3,56	—	0,80	0,07	6820930
APPT160408PDSRMM	2	—	9,41	5,26	1,49	0,79	0,06	6443662

WU20PM

HOLEMAKING

Indexable Milling • Copy Milling ISO Inserts • RDMX



- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

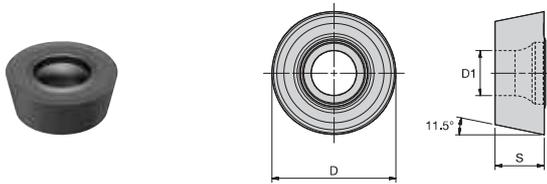
TAPPING

ISO catalogue number	cutting edges	D1	D	S	hm	
RDMX10T3M0	1	4,40	10	3,97	0,05	2567081
RDMX1604M0T	1	5,50	16	4,76	0,06	4147744

WU20PM

TURNING

Indexable Milling • Copy Milling ISO Inserts • RPMT

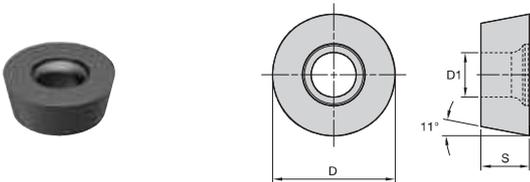


- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D1	D	S	hm	WU20PM
RPMT1204M0	1	4,40	12	4,76	0,05	4144073

Indexable Milling • Copy Milling ISO Inserts • RPMW



- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○

ISO catalogue number	cutting edges	D1	D	S	hm	WU20PM
RPMW1003M0	1	4,60	10	3,18	0,05	3367756
RPMW1204M0	1	4,40	12	4,76	0,05	3350976