VSM890™-12

UNIQUE 8-EDGED SOLUTION FOR SHOULDER AND FACE MILLING



GENERAL ENGINEERING

TRANSPORTATION

ENERGY



VSM890™-12

Weldon® End Mills: 32mm

Shell Mills: 40–250mm

8-Edged, Double-Sided True 90° Victory™ Shoulder-Face Mill (VSM)

Superior Metal Removal Rates (MRR) delivered through high-performance grades and chipbreakers.

Coarse, medium, and fine pitch cutter density to perfectly translate machining capability into higher productivity.

New pocket seat design for improved insert seating and great stability at roughing applications.

Applicable in a wide range of workpiece materials: aluminium, steel, cast iron, titanium, stainless steel, and high-temp alloys.

Comprehensive standard offering for cutter bodies and inserts to address light machining to heavy roughing jobs.

NEW! **SNHX-MM • Universal Geometry for Medium Machining. Corner Radii Expansion for -MM Chipbreaker**

NEW! **WK15CM**

WIDIA™

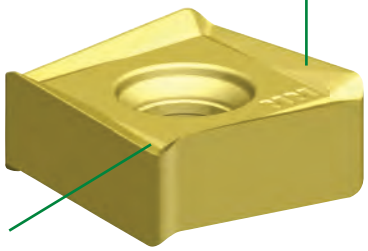
widia.com

VSM890™-12

0°/90° Shoulder Mills • VSM890-12

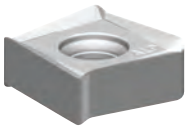


- True 90° wall and stepping down capability.
- Axial depth of cut capability; Ap1 max up to 9,8mm.
- Optimised chip gash design for proper chip evacuation.
- User-friendly pocket numbering system.
- Cutter bodies with internal coolant supply.
- Less bur creation on the workpiece.



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.

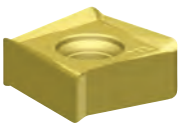
-ALP



N

First choice for Non-Ferrous materials.

-ML



P M S

First choice for Stainless Steel, light machining, and finishing jobs.

-MM NEW!



P M K S H

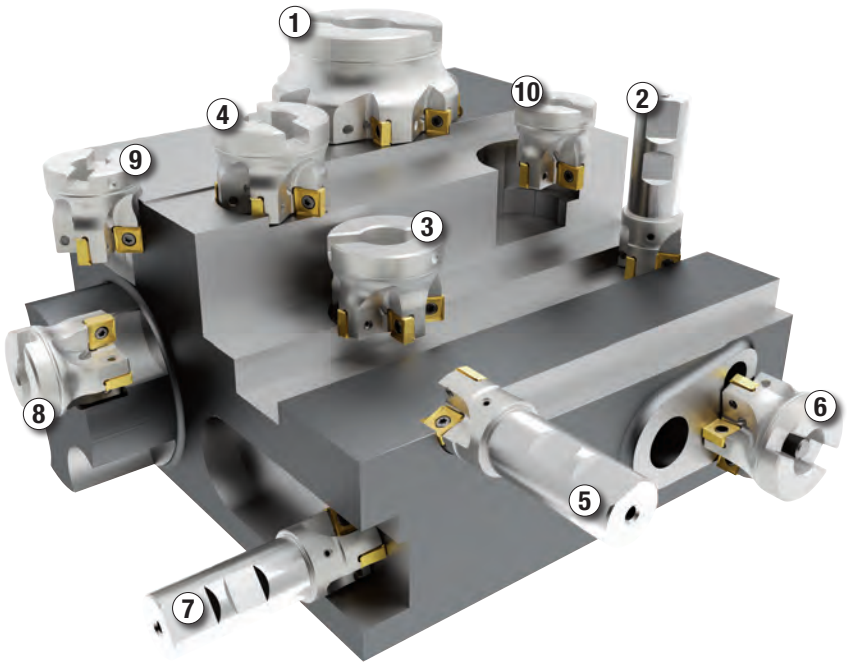
First choice for general purpose in all workpiece materials. Engineered for high-feed rates.

Finishing Capabilities/Lower Cutting Forces

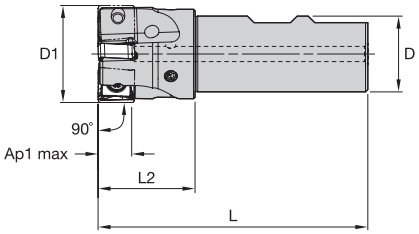
Geometry Strengthening/Stronger Cutting Edge Protection

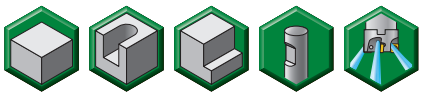
Applications

1. Face milling.
2. Full slotting with 100% radial engagement.
3. Shoulder milling with stepping down and great wall finish.
4. Shoulder milling with low axial and high radial engagement.
5. Shoulder milling with low radial and high axial engagement.
6. HPC face milling. First choice to clean up castings.
7. Dynamic/trochoidal slot milling.
8. Z-axis plunge milling.
9. Z-axis contour plunge milling.
10. Z-axis zig-zag slot plunge milling.



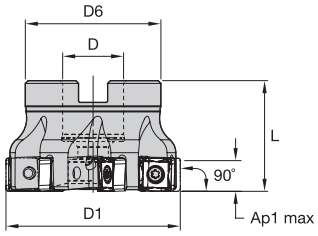
Weldon® End Mills • Metric

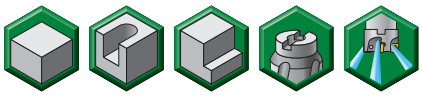




order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6596066	VSM890D032Z03B25SN12	32	25	89	32	9,8	3	33200	Yes	0,31

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

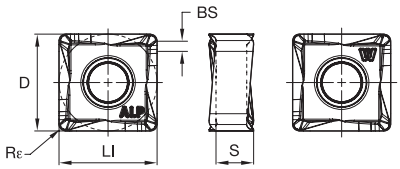
FOR SPARE PARTS, PLEASE VISIT WIDIA NOVO™ OR WIDIA.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

VSM890™-12

0°/90° Shoulder Mills • VSM890-12

Inserts • SNHX-ALP • For Aluminium and Other Non-Ferrous Alloys

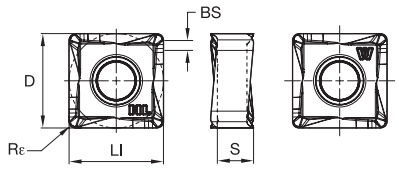


● first choice
○ alternate choice

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

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

Inserts • SNHX-ML • Precision Finishing and Light Machining



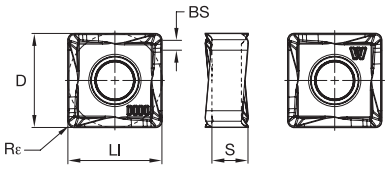
● first choice
○ alternate choice

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

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

Inserts • SNHX-MM • Universal Geometry for Medium Machining





● first choice
○ alternate choice

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

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

For M4000 cartridge milling system, please see page 12.



VSM890™-12
M4000CA-XN10
(MM6433216)

P M K S



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

0°/90° Shoulder Mills • VSM890-12

Recommended Starting Speeds [m/min]*

Material Group		WK15CM			WN25PM			WP25PM			WP40PM			WS40PM			WU10PM		
P	1	–	–	–	–	–	–	330	**285**	270	295	**260**	245	–	–	–	–	–	–
	2	–	–	–	–	–	–	275	**240**	200	250	**215**	180	–	–	–	–	–	–
	3	–	–	–	–	–	–	255	**215**	175	230	**195**	160	–	–	–	–	–	–
	4	–	–	–	–	–	–	225	**185**	150	205	**170**	135	–	–	–	–	–	–
	5	–	–	–	–	–	–	185	**170**	150	170	**155**	135	170	**145**	120	–	–	–
	6	–	–	–	–	–	–	165	**125**	100	150	**115**	90	150	**110**	80	–	–	–
M	1	–	–	–	–	–	–	205	**180**	165	195	**170**	155	210	**170**	140	–	–	–
	2	–	–	–	–	–	–	185	**160**	130	175	**150**	125	180	**145**	120	–	–	–
	3	–	–	–	–	–	–	140	**120**	95	130	**115**	90	145	**110**	85	–	–	–
K	1	420	**385**	340	–	–	–	230	**205**	185	–	–	–	–	–	–	295	**265**	240
	2	335	**295**	275	–	–	–	180	**160**	150	–	–	–	–	–	–	230	**205**	190
	3	280	**250**	230	–	–	–	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	–	–	–
	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.*

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

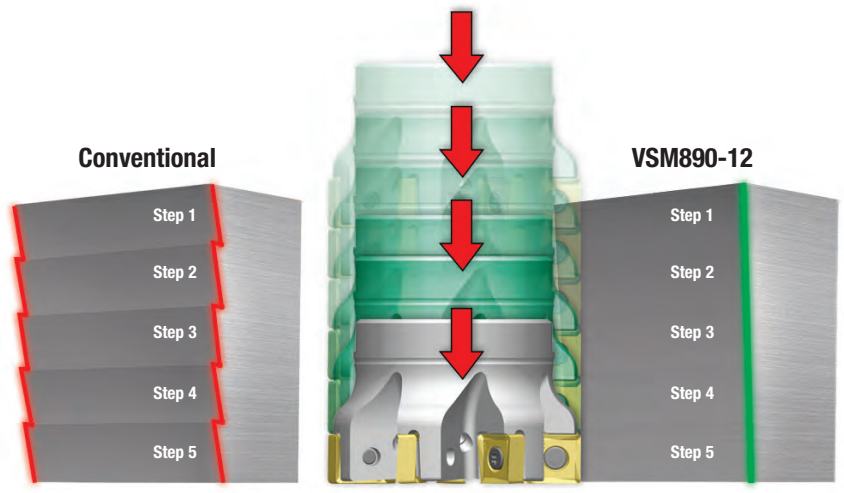
NOTE: Use "Light Machining" values as starting feed rate.

0°/90° Shoulder Mills • VSM890™-12

Best Practices

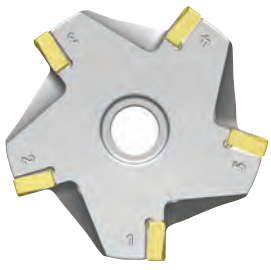
True 90° roughing tool with embedded finishing capabilities all in one tool.

Best-in-class wall finish with VSM890-12 in axial stepping-down jobs. For many shop floor setups, no additional finishing is required resulting in shorter machining time and lower tooling cost.



Excellent wall finish with VSM890-12

Coarse Pitch



- Unstable setup.
- Low spindle power.
- High axial depth of cut Ap1.
- Low feed rate.
- Machining aluminium.
- Driven tools.

Medium Pitch



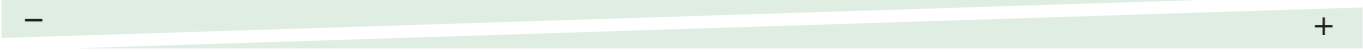
- Regular setup.
- Regular spindle power.
- Medium feed rate.

Fine Pitch



- Rigid setup.
- High spindle power.
- Low axial depth of cut Ap1.
- High feed rate.
- Boost productivity and cut into cycle time.

Machining Stability

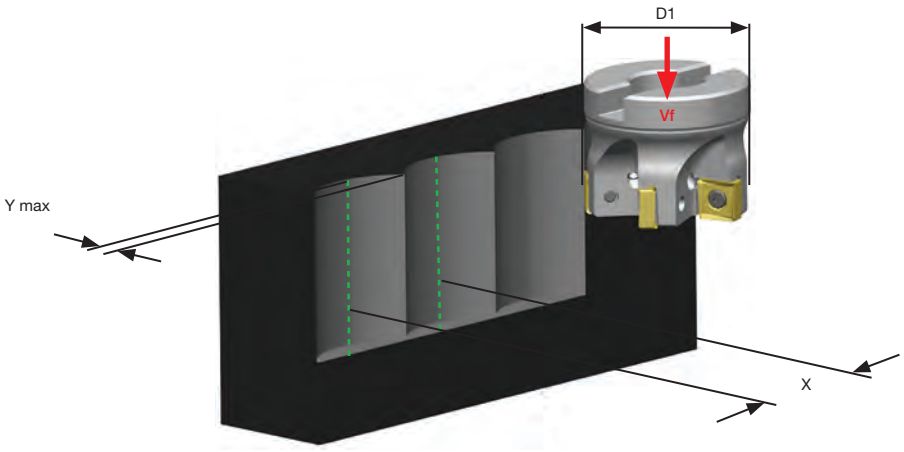


VSM890™-12

0°/90° Shoulder Mills • VSM890-12

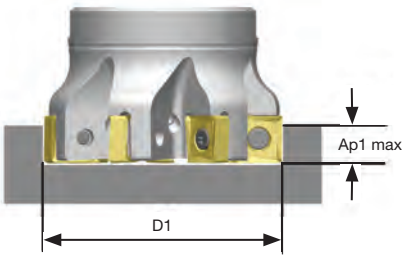
VSM890-12 Z-Axis Plunge Milling

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



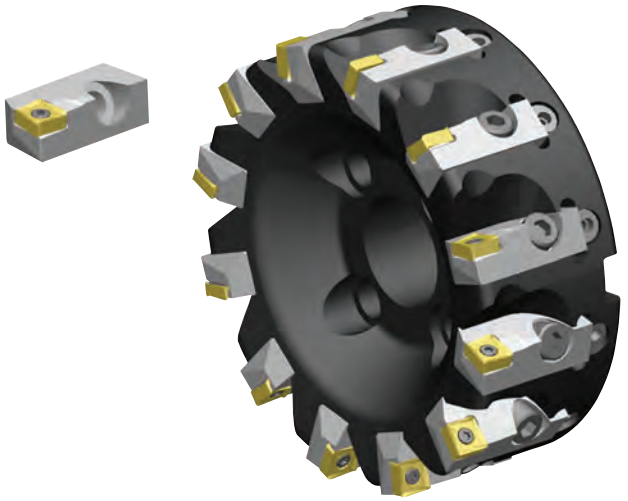
VSM890-12 Ap1 max at Full Slotting, 100% Radial Cutter Engagement

	Recommended Cutter Density	Ap1 max		
D1 diameter	Z	Grey 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



VSM890-12 Cartridge for M4000

M4000CA-SNHX12
(MM6602179)



NEW!

WIDIA™ Victory™

WS40PM

Breakthrough in the latest substrate and coating technology to boost productivity in **stainless steels and high-temp alloys**



Advanced Milling Grade for Titanium

Multilayer PVD AlTiN-TiN Coating

- Improved chemical and abrasive wear resistance.
- Consistent tool life performance.
- Primarily for wet machining. Also great results in dry machining.

New Medium-Grained Substrate

- Minimises tendency for thermal cracking.
- Excellent fatigue resistance and edge strength.
- Rich in cobalt content for improved toughness.

widia.com

WIDIA™

VXF™

VICTORY™ X-FEED™

NEXT LEVEL OF HIGH-FEED MILLING



VXF is a high-feed productivity booster designed to establish new industry standards with market-leading milling grades like WS40PM.

AEROSPACE

GENERAL ENGINEERING

TRANSPORTATION

ENERGY



VXF™-07

Ap1 max: 0,9mm
fz max: 1,2mm/z

NEW!

VXF™-09

Ap1 max: 1,5mm
fz max: 2,0 mm/z

VXF™ -12

Ap1 max: 2,5mm
fz max: 3,0 mm/z

NEW!

VXF™ -16

Ap1 max: 3,5mm
fz max: 2,0 mm/z

Optimised cutter body and chip gash design perfectly serves high-feed requirements.

PSTS inserts for powerful low cost per edge high-feed milling.

Cutters with internal coolant supply.

Nickel-plated surface protection.

WIDIA™

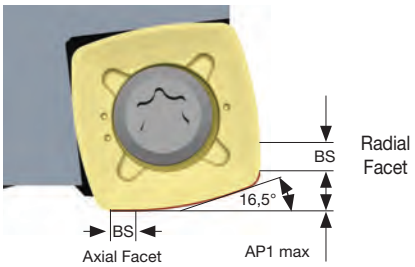
widia.com

VXF™

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

- 16.5° lead angle redistributes cutting forces in the spindle z-axis direction.
- Greatly reduces tool deflection and vibrations for improved tool life.
- Suitable for long tool reach.
- Unique integrated radial wiping facet to achieve a nice wall finish at pocket and helical interpolation milling.
- Durable cutting edges qualified to machine a wide range of materials.
- WS40PM — best-in-class milling grade for machining stainless steel and HTA.

Perfect combination of round and square insert style.

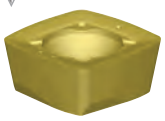


Specifically engineered chipbreakers for powerful high-feed milling.

VXF-07

NEW

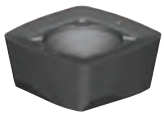
-MM



P M S

First choice for Soft Steel, Stainless Steel, and High-Temp Alloys. Best fit for pocketing and profiling operations.

-MH



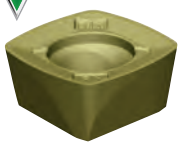
P H

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

VXF-09

NEW

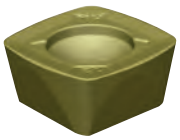
-MM



P M S

First choice for Soft Steel, Stainless Steel, and High-Temp Alloys. Best fit for pocketing and profiling operations.

-MH

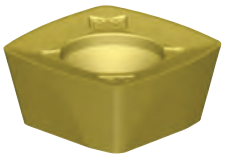


P

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

VXF-12

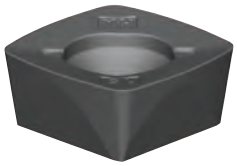
-MM



P M S

First choice for Soft Steel, Stainless Steel, and High-Temp Alloys. Best fit for pocketing and profiling operations.

-MH



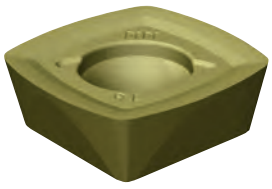
P

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

VXF-16

NEW

-MM



P M S

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

Lower Cutting Forces

Geometry Strengthening/Stronger Cutting Edge Protection

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

Comprehensive standard offering at one glance to match all shop-floor needs for high-feed milling.

VXF-07



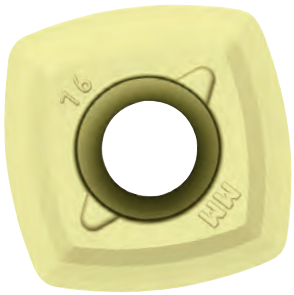
VXF-09



VXF-12



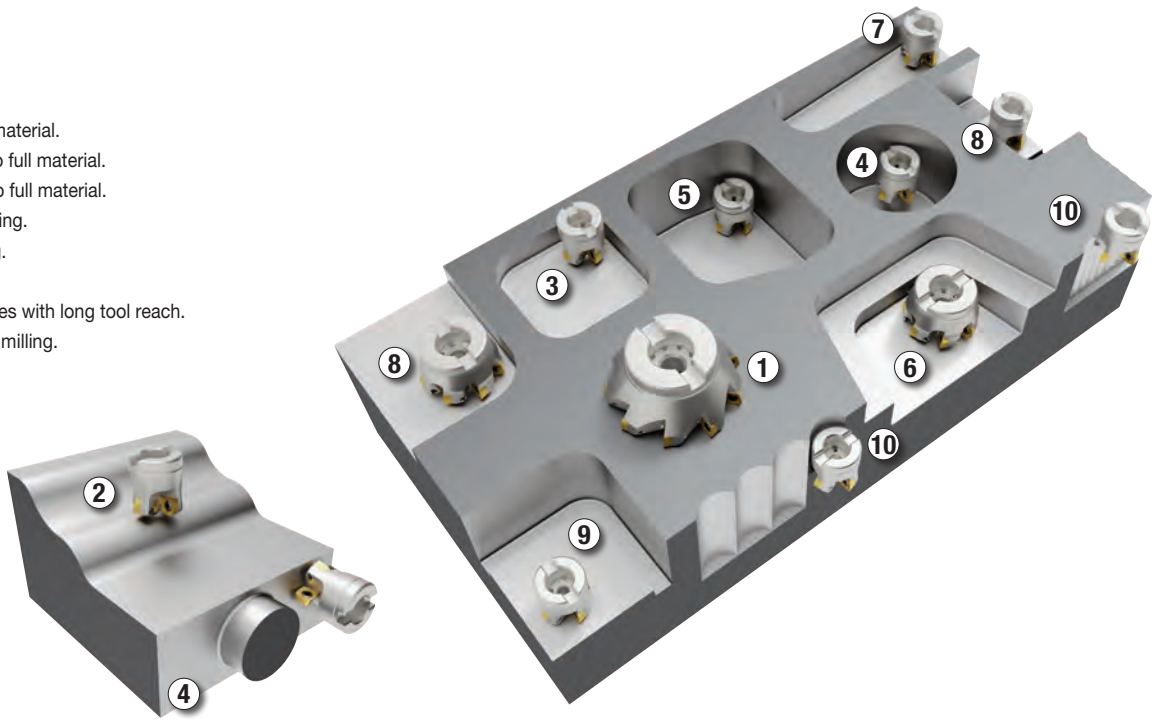
VXF-16



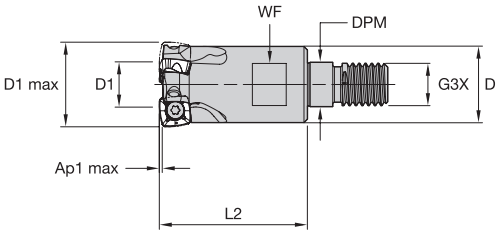
VXF Platform	Ap1 max (Metric)	fz max (Metric)
07	0,9mm	< 1,2mm
09	1,5mm	< 2,0mm
12	2,5mm	< 3,0mm
16	3,5mm	< 2,0mm

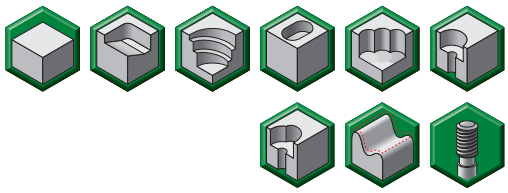
Applications

1. Face milling.
2. 3D profile milling.
3. Pocket milling into full material.
4. Helical interpolation into full material.
5. Deep pocket milling into full material.
6. Dynamic/trochoidal milling.
7. Aggressive ramp milling.
8. Contour Milling.
9. Face milling deep cavities with long tool reach.
10. Z-axis contour plunge milling.



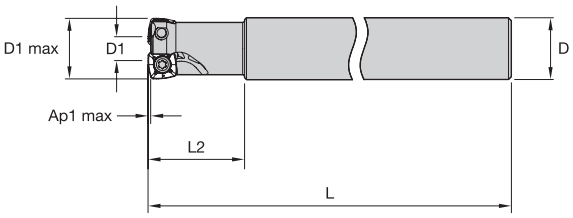
Screw-On End Mills • Metric

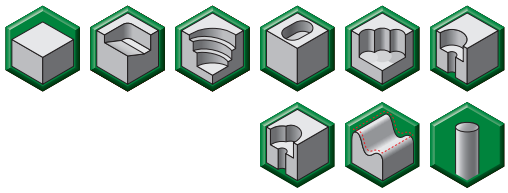




order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597130	VXF016Z02M08XP07	16	7	13	8,5	M8	25	10	0,9	2	5.9°	65000	Yes	0,02
6597151	VXF020Z03M10XP07	20	11	18	10,5	M10	35	15	0,9	3	3.4°	57000	Yes	0,07
6597152	VXF025Z04M12XP07	25	16	21	12,5	M12	35	17	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

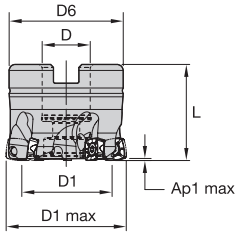
Cylindrical End Mills • Metric

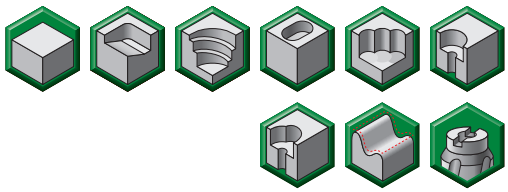




order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597154	VXF016Z02A16XP07L180	16	7	16	180	25	0,9	2	5.9°	65000	Yes	0,24
6597155	VXF018Z02A18XP07L180	18	9	18	180	25	0,9	2	5.4°	61000	Yes	0,31
6597156	VXF020Z03A20XP07L190	20	11	20	190	32	0,9	3	3.4°	57000	Yes	0,41
6597157	VXF025Z04A25XP07L200	25	16	25	200	40	0,9	4	2.2°	49000	Yes	0,69

Shell Mills • Metric



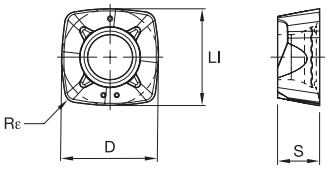


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597158	VXF040Z05S16XP07	40	31	16	37	32	0,9	5	1.0°	35000	Yes	0,19
6597159	VXF050Z07S22XP07	50	41	22	42	40	0,9	7	.7°	31300	Yes	0,32

FOR SPARE PARTS, PLEASE VISIT WIDIA NOVO™ OR WIDIA.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

Inserts • XPPT-MM • Best Fit for Pocketing and Profiling Operations

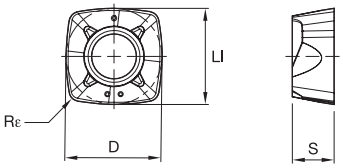


● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	LI	S	D	Rε	WP25PM	WP40PM	WS40PM	WU10PM
XPPT070308ERMM	4	7,30	3,17	7,30	0,80	6595819	-	6595820	-

Inserts • XPPW-MH • Dedicated Geometry for Heavy Roughing



● first choice
○ alternate choice

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

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

For M4000 cartridge milling system, please see page 12.



VSM890™-12
M4000CA-XN10
(MM6433216)

P M K S



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**	–	–

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.*

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 0,60 Axial Depth of Cut (AP1)

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

At 0,90 Axial Depth of Cut (AP1)

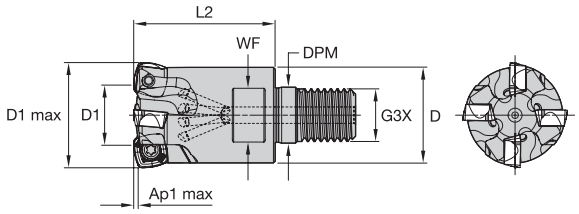
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,42	**1,21**	2,20	0,30	**0,83**	1,41	0,22	**0,60**	1,01	0,19	**0,52**	0,87	0,18	**0,48**	0,79	.E..MM
.S..MH	0,78	**1,68**	2,79	0,55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

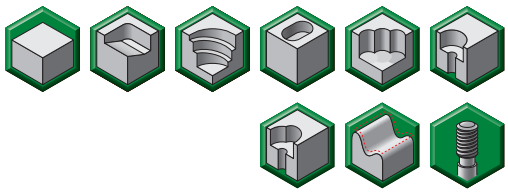
At 0,70 Axial Depth of Cut (AP1)

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	0,37	**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.

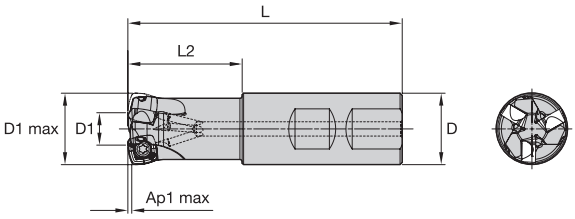
Screw-On End Mills • Metric

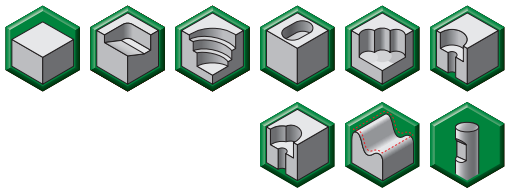




order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597731	VXF025Z03M12XD09	25	11	21	12,5	M12	35	9	1,5	3	2.8°	48500	Yes	0,09
6597732	VXF032Z03M16XD09	32	18	29	17,0	M16	43	10	1,5	3	1.5°	40500	Yes	0,20
6597733	VXF032Z04M16XD09	32	18	29	17,0	M16	43	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

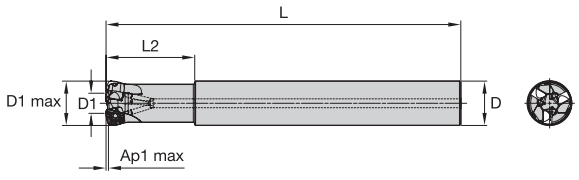
Weldon® End Mills • Metric

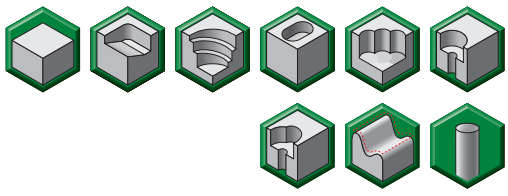




order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597736	VXF025Z03B25XD09	25	11	25	96	40	1,5	3	2.8°	48500	Yes	0,28
6597737	VXF032Z04B25XD09	32	18	25	96	40	1,5	4	1.5°	40500	Yes	0,36

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
6597738	VXF025Z03A25XD09	25	11	25	100	32	1,5	3	2.8°	48500	Yes	0,32
6597742	VXF025Z03A25XD09L200	25	11	25	200	50	1,5	3	2.8°	48500	Yes	0,67
6597743	VXF032Z03A25XD09L200	32	18	32	200	40	1,5	3	1.5°	40500	Yes	0,75
6597739	VXF032Z04A25XD09	32	18	32	110	40	1,5	4	1.5°	40500	Yes	0,42
6597744	VXF032Z04A25XD09L200	32	18	32	200	40	1,5	4	1.5°	40500	Yes	0,75

FOR SPARE PARTS, PLEASE VISIT WIDIA NOVO™ OR WIDIA.COM.

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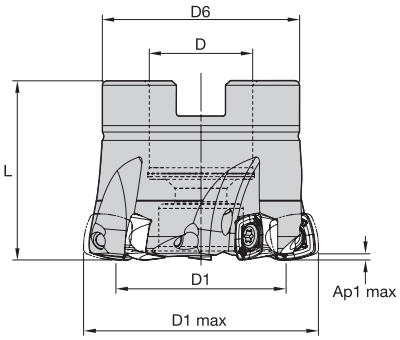
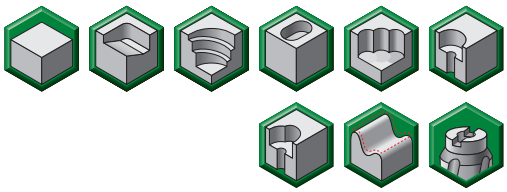
Shell Mills • Metric



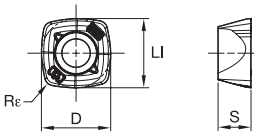


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597746	VXF040Z04S16XD09	40	26	16	37	32	1,5	4	.8°	34500	Yes	0,15
6597747	VXF040Z05S16XD09	40	26	16	37	32	1,5	5	.8°	34500	Yes	0,14
6597748	VXF042Z05S16XD09	42	28	16	37	32	1,5	5	.8°	34000	Yes	0,16
6597750	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

FOR SPARE PARTS, PLEASE VISIT WIDIA NOVO™ OR WIDIA.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

Inserts • XDPT-MM

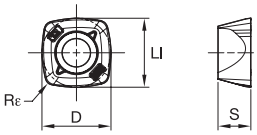


● first choice
○ alternate choice

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

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

Inserts • XDPT-MH



● first choice
○ alternate choice

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

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

For M4000 cartridge milling system, please see page 12.



VSM890™-12
M4000CA-XN10
(MM6433216)

P M K S



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

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.*

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 0,90 Axial Depth of Cut (AP1)

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

At 1,10 Axial Depth of Cut (AP1)

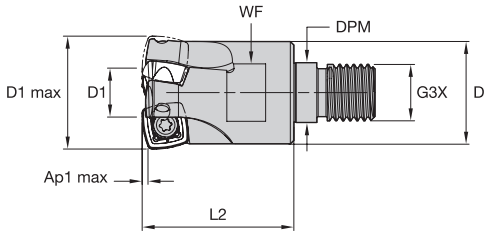
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,44	**1,28**	1,98	0,32	**0,90**	1,37	0,24	**0,67**	1,01	0,21	**0,58**	0,87	0,19	**0,53**	0,80	.E..MM
.S..MH	0,64	**1,42**	2,37	0,45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

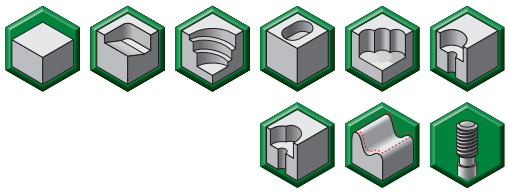
At 1,50 Axial Depth of Cut (AP1)

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

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

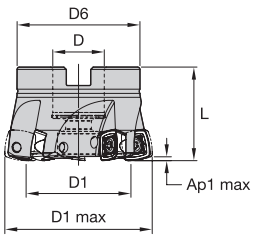
Screw-On End Mills • Metric

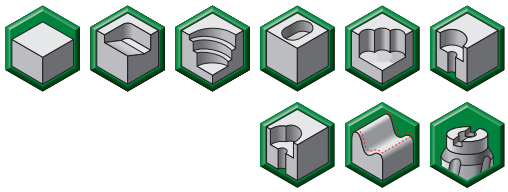




order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596723	VXF032Z03M16XD12	32	14	29	17,0	M16	43	24	2,5	3	1.8°	31500	Yes	0,19

Shell Mills • Metric



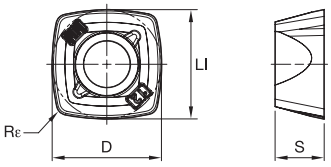


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596725	VXF040Z04S22XD12	40	22	22	38	40	2,5	4	1.4°	26500	Yes	0,19
6596727	VXF042Z04S22XD12	42	24	22	38	40	2,5	4	1.3°	25500	Yes	0,21
6596728	VXF050Z04S22XD12	50	32	22	48	40	2,5	4	.9°	22500	Yes	0,31
6596729	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 NOVO™ OR WIDIA.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

Inserts • XDPT-MM • Best Fit for Pocketing and Profiling Operations

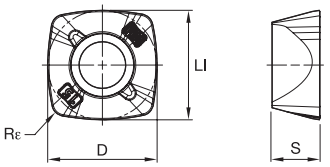


● first choice
○ alternate choice

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

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

Inserts • XDPT-MH • Dedicated Geometry for Heavy Roughing



● first choice
○ alternate choice

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

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

For M4000 cartridge milling system, please see page 12.



VSM890™-12
M4000CA-XN10
(MM6433216)



P M K S

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

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.*

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)

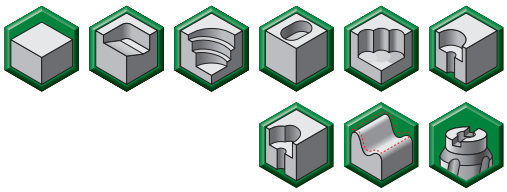
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,43	**1,39**	2,20	0,31	**0,99**	1,56	0,23	**0,74**	1,15	0,20	**0,64**	1,00	0,19	**0,59**	0,92	.E..MM
.S..MH	0,62	**1,57**	2,41	0,45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

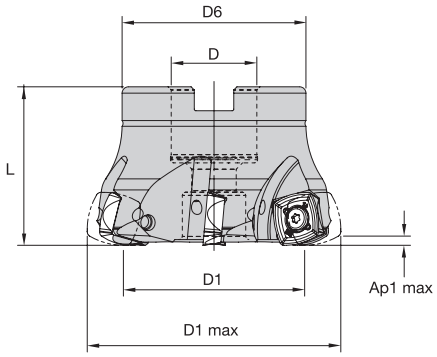
At 2,50 Axial Depth of Cut (AP1)

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.

Shell Mills • Metric



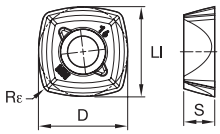


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597776	VXF050Z04S22XE16	50	27	22	45	45	3,5	4	1.4°	27500	Yes	0,29
6597777	VXF063Z05S22XE16	63	40	22	47	40	3,5	5	.9°	22000	Yes	0,36
6597778	VXF080Z06S27XE16	80	57	27	58	50	3,5	6	.6°	19000	Yes	0,85
6597779	VXF100Z08S32XE16	100	77	32	68	50	3,5	8	.4°	16500	Yes	1,29
6597780	VXF125Z10S40XE16	125	102	40	84	63	3,5	10	.3°	14500	Yes	2,73

FOR SPARE PARTS, PLEASE VISIT WIDIA NOVO™ OR WIDIA.COM.

MOUNTING SCREWS ARE NOT INCLUDED IN STANDARD PACKAGING.

Inserts • XEPT-MM



● first choice
○ alternate choice

P	●	○
M	●	●
K	○	
N		
S	●	●
H		

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

For M4000 cartridge milling system, please see page 12.



VSM890™-12
M4000CA-XN10
(MM6433216)

P M K S



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

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.*

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)

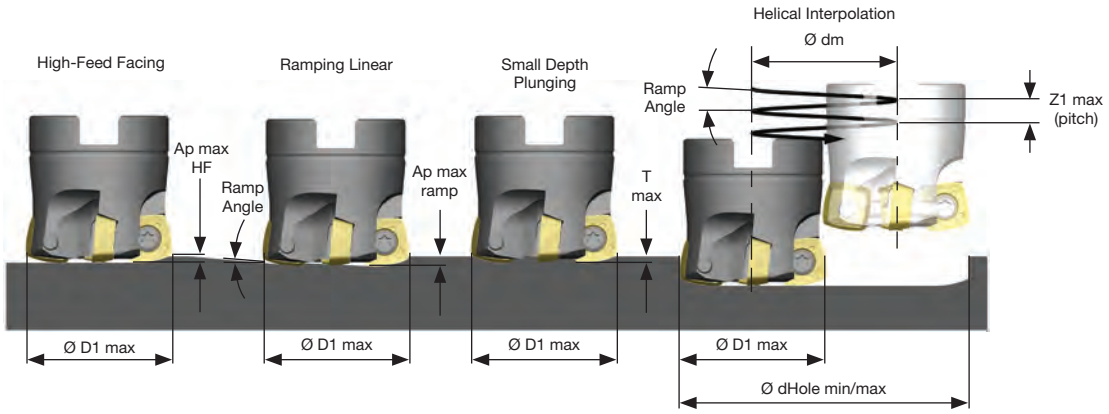
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,30	**0,98**	1,66	0,22	**0,71**	1,18	0,17	**0,53**	0,88	0,14	**0,46**	0,76	0,13	**0,42**	0,70	.E..MM

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

VXF™

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

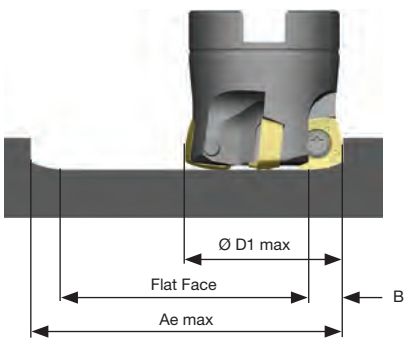
Best Practices



		High-feed Facing	Ramping Linear		Helical Interpolation				Small Depth Plunging
series	D1 max	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

Ødm = ØHole–ØD1 max
Z1 = Ødm x 3,14 x tan ramp angle. Z1 ≤ Z1 max and ≤ ramp angle max
Ramp angle = arc tan x ((Z1)/Ødm x 3,14))

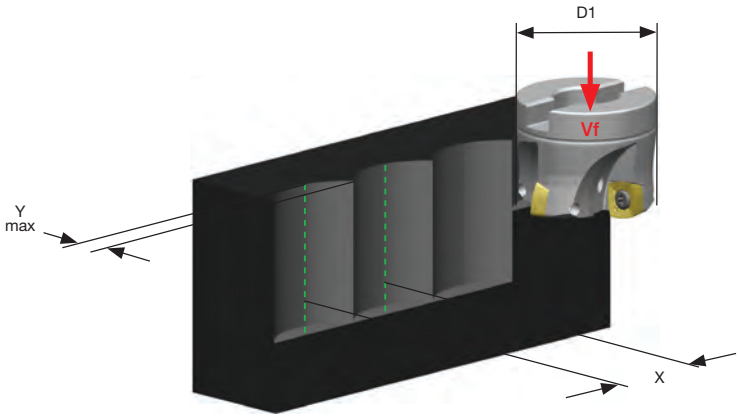
series	D1 max	X
VXF-07	16–50	4,20
VXF-09	25–63	6.80
VXF-12	32–100	9,10
VXF-16	50–125	11.40



Ae max ≤ 2 x ØD1 max–2 x B
Flat Face = Ae max–2 x B

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

Z-Axis Plunge Milling



VXF-07

D1 max	Y max	X
16	3	12,49
18	3	13,41
20	3	14,28
25	3	16,24
32	3	18,65
40	3	21,07
50	3	23,74

VXF-09

D1 max	Y max	X
25	6	21,35
32	6	24,98
35	6	26,38
40	6	28,56
42	6	29,39
50	6	32,49
52	6	33,22
63	6	36,98

VXF-12

D1 max	Y max	X
32	9	28,77
40	9	33,40
42	9	34,46
50	9	38,41
52	9	39,34
63	9	44,09
66	9	45,29
80	9	50,55
100	9	57,23

VXF-16

D1 max	Y max	X
50	13	43,86
63	13	50,99
80	13	59,02
100	13	67,26
125	13	76,31

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

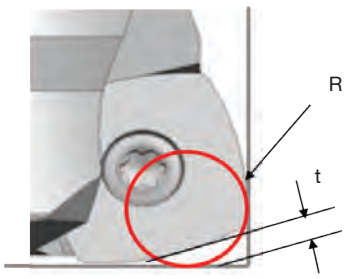
Light Machining	General Purpose	Heavy Machining

	Insert Geometry	Recommended Starting Feed per Tooth (Fz)			Insert Geometry	Y max
VXF-07	.E..MM	0,06	**0,15**	–	.E..MM	3,0
	.S..MH	0,10	**0,20**	–	.S..MH	3,0
VXF-09	.E..MM	0,07	**0,20**	0,30	.E..MM	6,0
	.S..MH	0,10	**0,22**	0.35	.S..MH	6,0
VXF-12	.E..MM	0,07	**0,20**	0,30	.E..MM	9,0
	.S..MH	0,10	**0,25**	0,35	.S..MH	9,0
VXF-16	.E..MM	0,07	**0.23**	0.38	.E..MM	13,0

CAM Programming

Programming Data

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

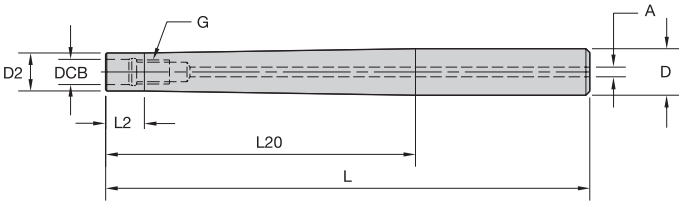


Heavy Metal Extensions

Anti-Vibration Tungsten Alloy with Through Coolant

Cylindrical Shank Extensions for Modular Heads

ERICKSON™

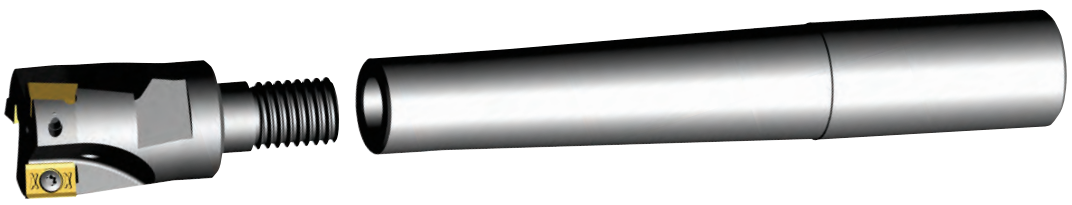




order number	catalogue number	DCB	G	D	D2	A	L	L2	L20
4160427	SS120STCHM06085M	6,5	M6	12	10	2,5	85	10	40
4160428	SS120STCHM06105M	6,5	M6	12	10	2,5	105	10	60
4160430	SS120STCHM06125M	6,5	M6	12	10	2,5	125	10	80
4160431	SS160STCHM08088M	8,5	M8	16	13	3,0	88	10	40
4160432	SS160STCHM08108M	8,5	M8	16	13	3,0	108	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

order number	catalogue number	DCB	G	D	D_2	A	L	L1	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.



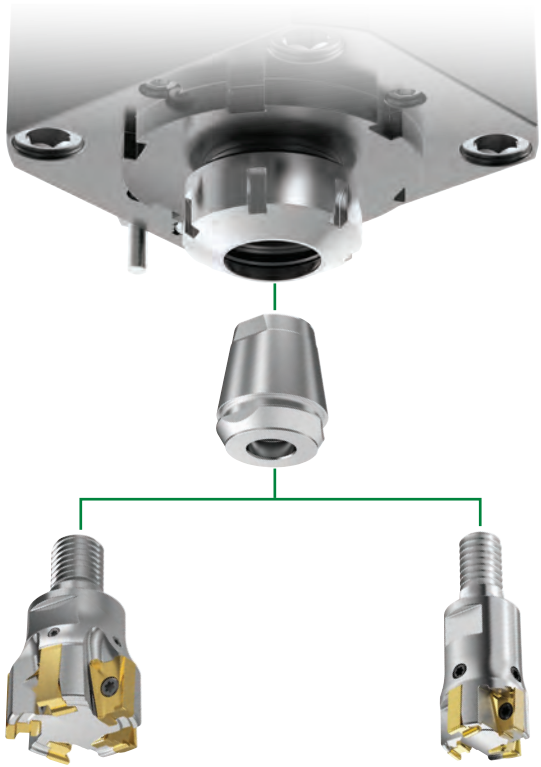
Compatible with all Standard ER Collet Chucks and ER Driven Units

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 utilisation through modular flexibility.

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



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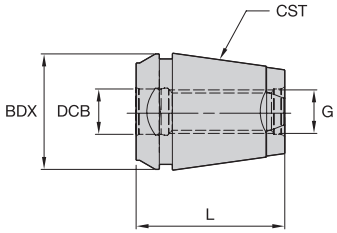


order number	catalogue number	CST	DCB	G	BDX	L
6587968	**ER25STM08**	ER25	9	M8	26	35
6587969	**ER25STM10**	ER25	11	M10	26	35
6587970	**ER25STM12**	ER25	13	M12	26	35
6588001	**ER32STM08**	ER32	9	M8	33	41
6588002	**ER32STM10**	ER32	11	M10	33	41
6588003	**ER32STM12**	ER32	13	M12	33	41
6588004	**ER32STM16**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



VSM

VICTORY™ SHOULDER MILLS EXPANSION

THE MOST VERSATILE 90° SHOULDER MILL PLATFORM IN THE WIDIA™ PORTFOLIO

AEROSPACE

GENERAL ENGINEERING

TRANSPORTATION

ENERGY



VSM11™

Ap Capabilities: Up to 11mm

Screw-On End Mills: 16–40mm

Weldon® End Mills: 12–32mm

Cylindrical End Mills: 12–32mm

Shell Mills: 40–125mm

M4000 Cartridge Milling System: 125–315mm

VSM11H Helical Cutters

Ap Capabilities: Up to 50mm

Weldon End Mills: 25–32mm

Shell Mills: 40–50mm



VSM17™

Ap Capabilities: Up to 16,4mm

Screw-On End Mills: 25–40mm

Weldon End Mills: 25–40mm

Cylindrical End Mills: 25–40mm

Shell Mills: 40–160mm

M4000 Cartridge Milling System: 125–315mm

VSM17H Helical Cutters

Ap Capabilities: 75mm

Shell Mills: 50–80mm

WIDIA™

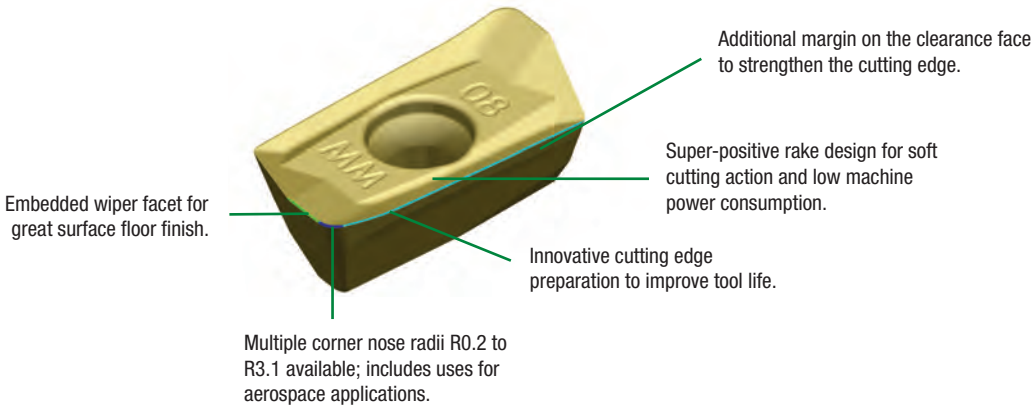
widia.com

VSM11™

0°/90° Shoulder Mills • VSM11



- True 90° shoulder milling platform; up to Ap1 max = 11mm.
- Aggressive ramping capability up to 10° with end mills with a diameter of 16mm.
- Optimised chip gash for improved cutter stability and chip flow.
- Well-guided internal coolant supply to the cutting edge.
- Best-in-class milling grade WS40PM boosts productivity when machining stainless steel and high-temp alloys.



Geometries for all material groups in shoulder milling applications.

-ALP



N

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

-PCD



N

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

-ML



P M S H

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

-MM



P M K S H

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

-MH



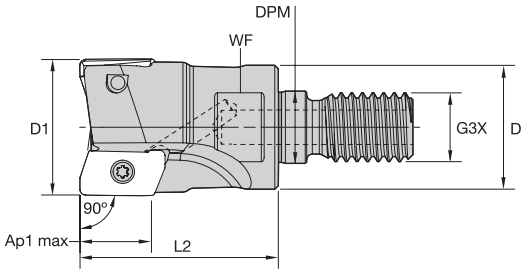
P M K S

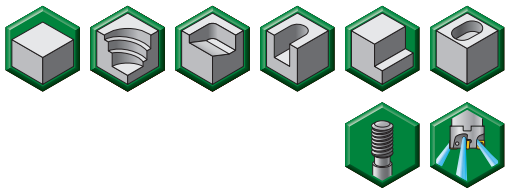
First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

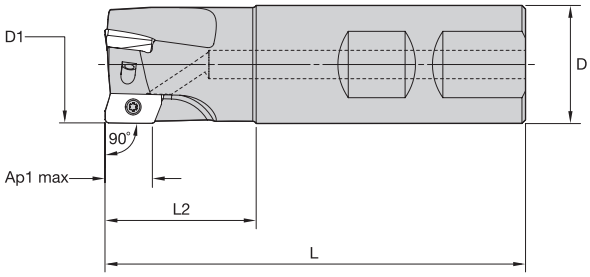
Screw-On End Mills • Metric

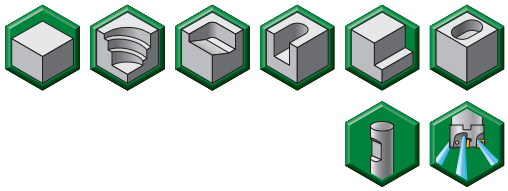




order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5417011	VSM11D016Z02M08XD11	16	13	8,5	M8	25	10	11,5	2	10.0°	41400	Yes	0,02
5417013	VSM11D020Z03M10XD11	20	18	10,5	M10	28	15	11,6	3	7.8°	35100	Yes	0,05
5417015	VSM11D025Z04M12XD11	25	21	12,5	M12	32	17	11,5	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

Weldon® End Mills • Metric

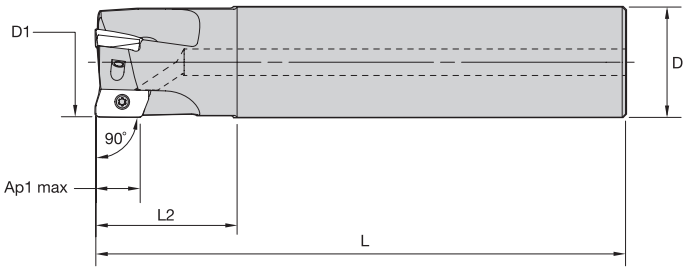


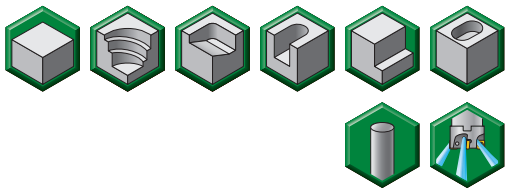


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416454	VSM11D012Z01B16XD11	12	16	70	21	11,7	1	3.7°	53100	Yes	0,08
6616467	VSM11D016Z02B12XD11	16	12	67	21	11,5	2	10.0°	41400	Yes	0,05
5416455	VSM11D016Z02B16XD11	16	16	70	21	11,5	2	10.0°	41400	Yes	0,09
6171449	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.

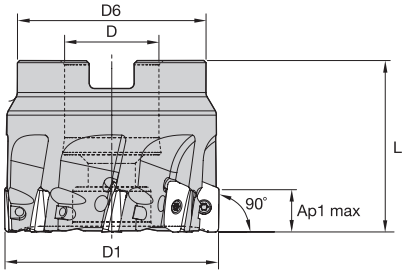
Cylindrical End Mills (Regular and Long Version) • Metric

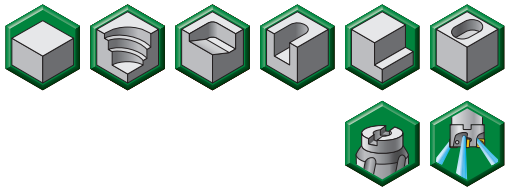




order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416632	VSM11D012Z01A16XD11L100	12	16	100	25	11,7	1	3.7°	53100	Yes	0,13
5416633	VSM11D016Z02A16XD11L100	16	16	100	31	11,5	2	10.0°	41400	Yes	0,12
5416700	VSM11D016Z02A16XD11L170	16	16	170	25	11,5	2	10.0°	41400	Yes	0,23
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

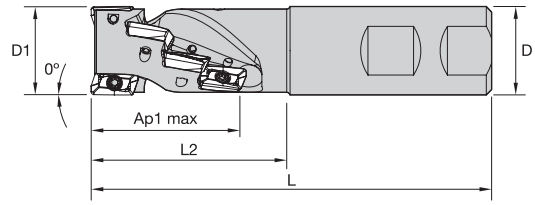
Shell Mills • Metric





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

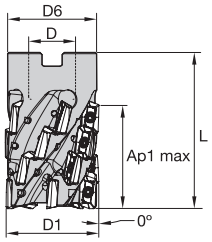
Helical End Mills with Weldon® Shank



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	8	2	4,5°	30000	Yes	0,32
6738389	VSM11H032Z03B32XD11	32	32	117	56	42	12	3	3,2°	26500	Yes	0,56
6738411	VSM11H032Z04B32XD11	32	32	117	56	42	16	4	3,2°	26500	Yes	0,55

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

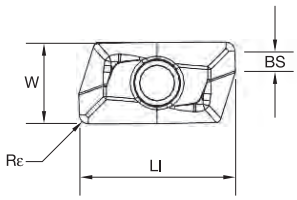
Helical Shell Mills



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	16	4	2,4°	22100	Yes	0,30
6738413	VSM11H040Z05S016XD11	40	16	37	60	42	20	5	2,4°	22100	Yes	0,29
6738414	VSM11H050Z04S022XD11	50	22	44	70	51	20	4	1,8°	19800	Yes	0,58
6378415	VSM11H050Z06S022XD11	50	22	44	70	51	30	6	1,8°	19800	Yes	0,55

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

Inserts • XDCT-ALP



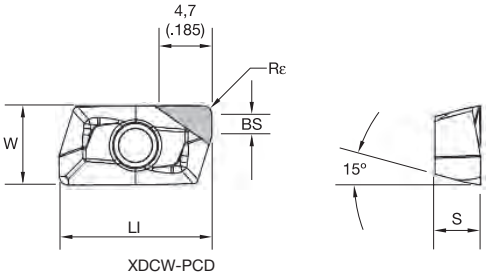
XDCT-ALP

● first choice
○ alternate choice

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

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

Inserts • XDCW-PCD



XDCW-PCD

● first choice
○ alternate choice

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

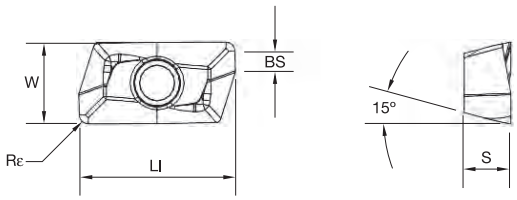
ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	5415420	5415421
XDCW110404PDFRPCD	1	13,41	2,22	4,00	6,90	0,40	0,02	'	
XDCW110408PDFRPCD	1	13,42	1,80	4,00	6,90	0,80	0,02		'



VSM11™

0°/90° Shoulder Mills • VSM11

Inserts • XDCT-ML



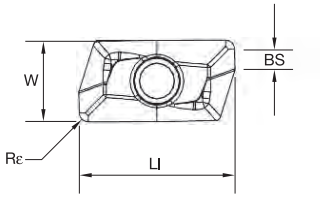
XDCT-ML

● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	Ll	BS	S	W	Rε	hm	WDN10U	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
XDCT110404PDERML	2	13,43	2,09	4,00	6,90	0,40	0,04	-	-	6242456	-	-	5536671	5536670	5642230	-	6180174	-
XDCT110408PDERML	2	13,44	1,69	4,00	6,90	0,80	0,04	-	5415549	6242457	-	-	5415548	5415547	5545065	5517826	6180173	5415546
XDCT110412PDERML	2	13,44	1,29	4,00	6,90	1,20	–	-	-	-	-	-	6408003	-	-	-	6408002	-
XDCT110416PDERML	2	13,44	0,88	4,00	6,89	1,60	0,04	-	-	-	-	-	5964861	-	5964810	-	6408004	-
XDCT110420PDERML	2	13,44	0,49	4,00	6,89	2,00	–	-	-	-	-	-	-	-	-	-	6408005	-
XDCT110424PDERML	2	13,44	0,16	4,00	6,88	2,40	–	-	-	-	-	-	-	-	-	-	6408006	-
XDCT110432PDERML	2	12,86	–	4,00	6,89	3,20	–	-	-	-	-	-	-	-	-	-	6408007	-

Inserts • XDPT-MM

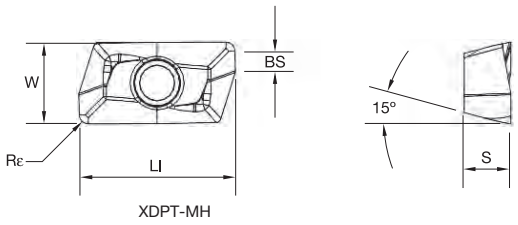


XDPT-MM

● first choice
○ alternate choice

| | | |

Inserts • XDPT-MH



XDPT-MH

● first choice
○ alternate choice

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

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

Insert Selection Guide

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

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			WU35PM		
P	1	455	**395**	370	295	**260**	245	–	–	–	–	–	–	260	**230**	215
	2	280	**255**	230	250	**215**	180	–	–	–	–	–	–	220	**190**	160
	3	255	**230**	205	230	**195**	160	–	–	–	–	–	–	200	**170**	140
	4	190	**175**	160	205	**170**	135	–	–	–	–	–	–	180	**150**	120
	5	260	**230**	210	170	**155**	135	–	–	–	170	**145**	120	150	**135**	120
	6	160	**135**	110	150	**115**	90	–	–	–	150	**110**	80	130	**100**	80
M	1	205	**185**	155	195	**170**	155	225	**200**	185	210	**170**	140	170	**150**	135
	2	185	**160**	140	175	**150**	125	205	**180**	145	180	**145**	120	155	**130**	110
	3	145	**130**	115	130	**115**	90	155	**135**	105	145	**110**	85	115	**100**	80
K	1	295	**265**	240	–	–	–	–	–	–	–	–	–	–	–	–
	2	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–
	3	195	**175**	160	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	45	**40**	30	40	**35**	25	35	**30**	25
	2	–	–	–	–	–	–	45	**40**	30	40	**35**	25	35	**30**	25
	3	–	–	–	–	–	–	55	**45**	30	50	**40**	25	45	**35**	25
	4	–	–	–	–	–	–	70	**60**	40	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.*

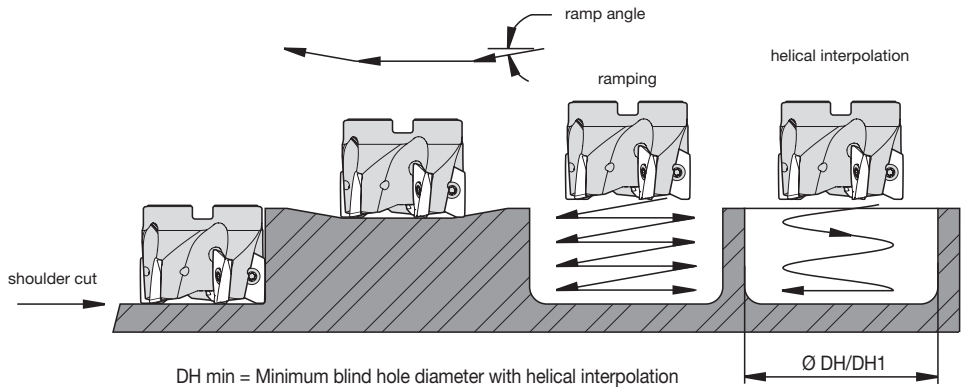
Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..PCD	0,12	**0,18**	0,29	0,08	**0,13**	0,21	0,06	**0,10**	0,16	0,06	**0,09**	0,14	0,05	**0,08**	0,12	.F..PCD
.F..ALP	0,12	**0,22**	0,31	0,08	**0,16**	0,23	0,06	**0,12**	0,17	0,06	**0,10**	0,15	0,05	**0,10**	0,14	.F..ALP
.E..ML	0,17	**0,27**	0,36	0,13	**0,20**	0,26	0,10	**0,15**	0,19	0,08	**0,13**	0,17	0,08	**0,12**	0,16	.E..ML
.S..MM	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..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" values as starting feed rate.

Best Practices

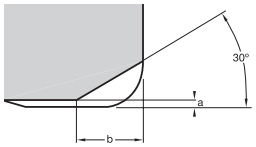


DH min = Minimum blind hole diameter with helical interpolation
DH1 max = Maximum blind hole diameter with flat bottom

cutting diameter (D1)	max RPM	max ramp angle to steel body interference	max flat-bottom hole diameter (DH1 max)	min hole diameter (DH min)
16	41400	10.00°	32,00	19,00
20	35100	7.80°	40,00	27,00
25	30200	5.30°	50,00	37,00
32	25800	3.60°	64,00	51,00
40	22600	2.60°	80,00	67,00
50	19900	2.00°	100,00	87,00
63	17500	2.00°	126,00	113,00
80	15300	1.00°	160,00	147,00
100	13600	0.90°	200,00	187,00
125	12100	0.70°	250,00	237,00

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

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

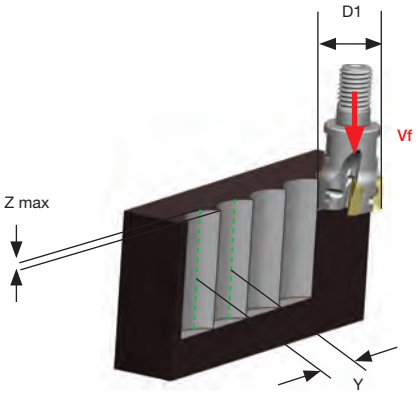


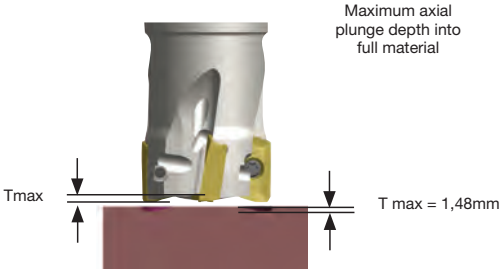
	material to remove	
insert corner radius	a	b
2,0–3,2mm	0,2mm	1,8mm

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.

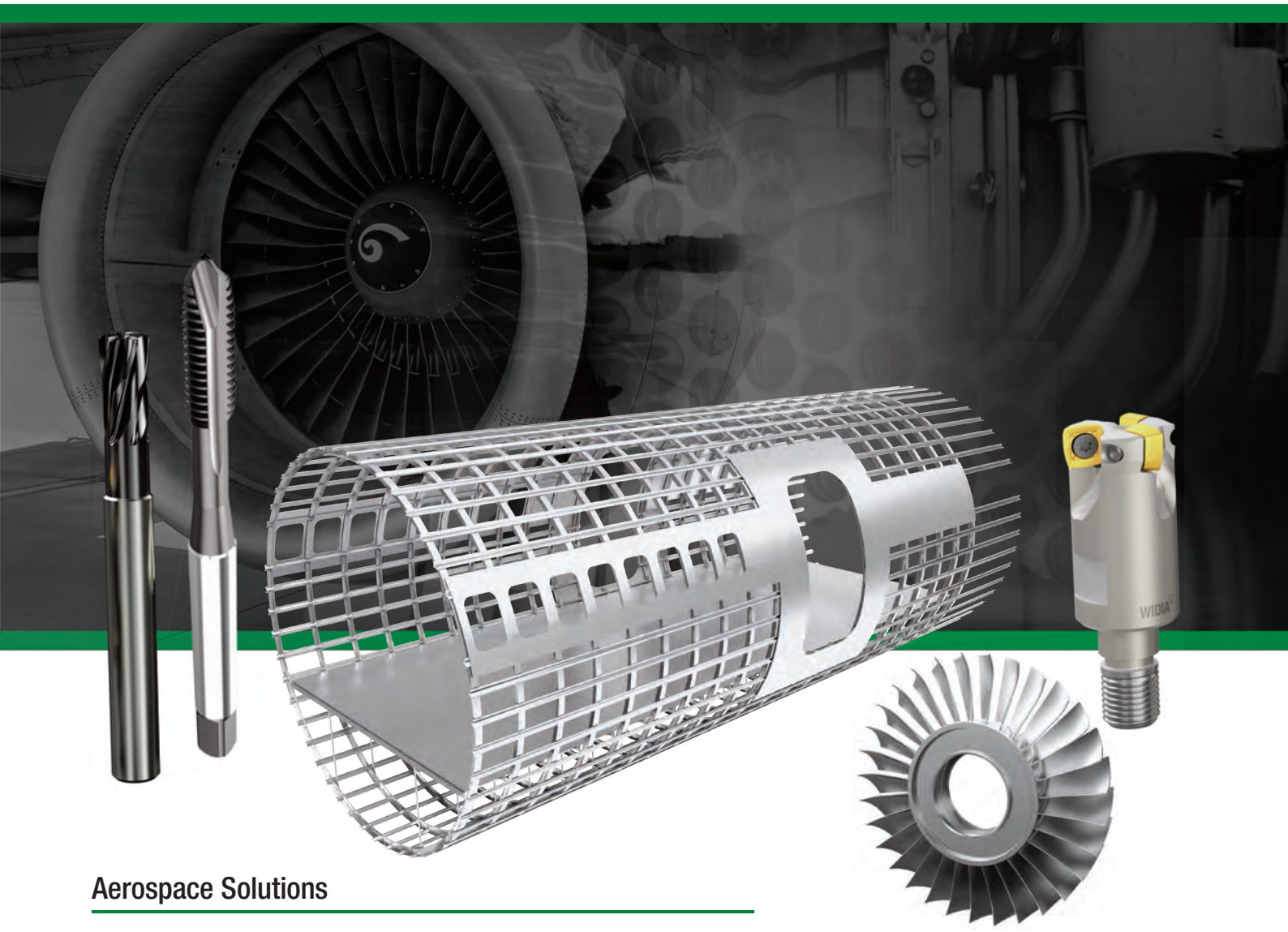
VSM11 Z-Axis Plunging

cutting diameter (D1)	Z max	Y
16	6,4	15,68
18	6,4	17,23
20	6,4	18,66
22	6,4	19,98
25	6,4	21,82
32	6,4	25,60
40	6,4	29,33
50	6,4	33,41
63	6,4	38,07
80	6,4	43,41
100	6,4	48,95
125	6,4	55,10
160	6,4	62,71





Aerospace Solutions from WIDIA™



Aerospace Solutions

VXF™, X-Feed™ for titanium and the aerospace fastener tap, were created to fill the growing need for high-performance tooling in the aerospace industry

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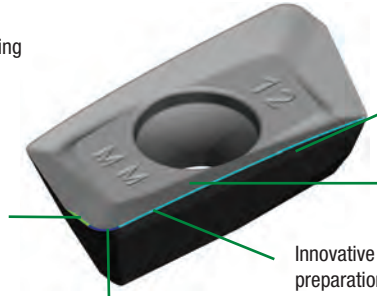
WIDIA GTD™ WIDIA™ WIDIA HANITA™

VSM17™

0°/90° Shoulder Mills • VSM17



- True 90° shoulder milling platform; up to Ap1 max = 16mm.
- Aggressive ramping capability up to 8.8° with end mills with a diameter of 25mm.
- Optimised chip gash for improved cutter stability and chip flow.
- Well-guided internal coolant supply to the cutting edge.
- Best-in-class milling grade WS40PM boosts productivity when machining stainless steel and high-temp alloys.



Additional margin on the clearance face to strengthen the cutting edge.

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

Embedded wiper facet for great surface floor finish.

Innovative cutting edge preparation to improve tool life.

Multiple corner nose radii R0.4 to R6.0 available; includes uses for aerospace applications.

Geometries for all material groups in shoulder milling applications.

- ALP



N

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

-ML



P M S H

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

-MM



P M K S H

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

-MH



P M K S

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

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

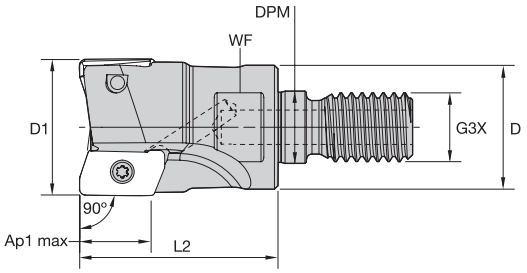
2x Higher Metal Removal Rate!

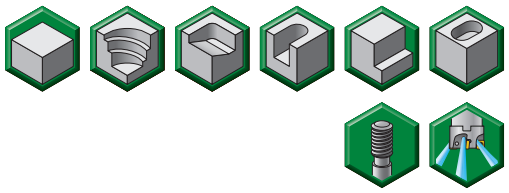


WIDIA™ CUSTOMER VICTORY

Specifications	Before VSM	WIDIA™
Workpiece	–	K2 — Ductile Iron
Insert	–	XDPT170408PESRMM
Grade	–	WK15CM
Cutter	–	VSM17D080Z7S27XD17
Diameter	–	80mm
No. cutting edges (z)	6	7
Vc	160 m/min	**210 m/min**
Feed rate (fz)	0,078mm	**0,11mm**
Vf	298 mm/min	**665 mm/min**
Ap	3mm	**3mm**
ae	60mm	**60mm**
MRR	54 cm^3min	**120 cm^3min**
Coolant	Dry	**Dry**

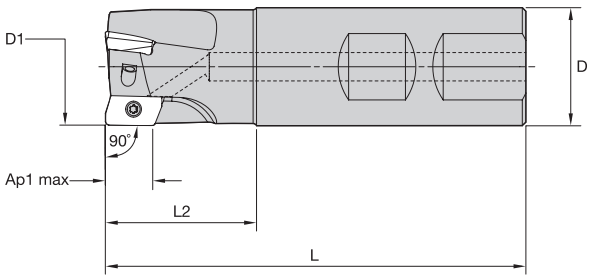
Screw-On End Mills • Metric

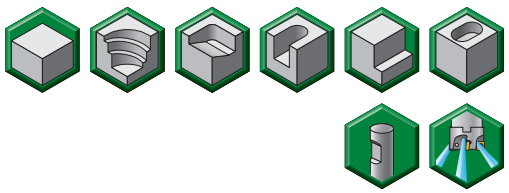




order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988091	**VSM17D025Z02M12XD17**	25	21	12,5	M12	35	17	16,4	2	8.8°	41800	Yes	0,08
5988092	**VSM17D032Z03M16XD17**	32	29	17,0	M16	40	24	16,3	3	5.7°	34700	Yes	0,17
5988131	**VSM17D40Z03M016XD17**	40	29	17,0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

Weldon® End Mills • Metric

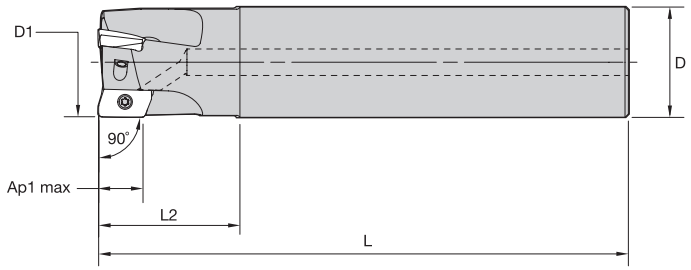


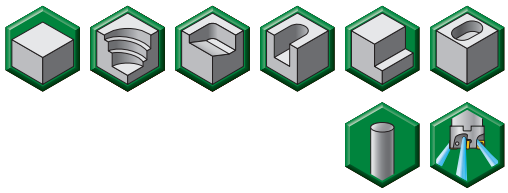


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988102	**VSM17D025Z02B25XD17**	25	25	90	33	16,4	2	8.8°	41800	Yes	0,26
5988103	**VSM17D032Z03B32XD17**	32	32	100	39	16,3	3	5.7°	34700	Yes	0,48
5988104	**VSM17D040Z04B40XD17**	40	40	110	39	16,2	4	4.0°	29800	Yes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

NOTE: Weldon type not recommended for finishing operations.

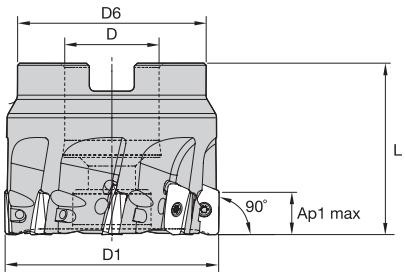
Cylindrical End Mills (Regular and Long Version) • Metric

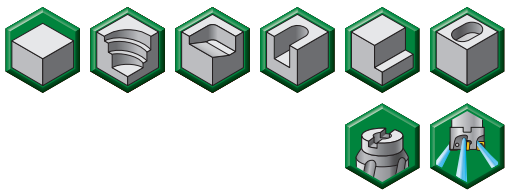




order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988055	VSM17D025Z02A25XD17L110	25	25	110	44	16,4	2	8.8°	41800	Yes	0,32
5988056	VSM17D025Z02A25XD17L170	25	25	170	44	16,4	2	8.8°	41800	Yes	0,54
5988107	VSM17D032Z02A32XD17L120	32	32	120	50	16,3	2	5.7°	34700	Yes	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

Shell Mills • Metric

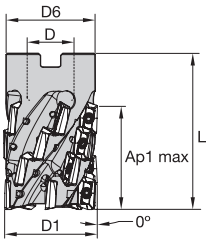




order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988094	VSM17D040Z04S16XD17	40	16	37	40	16,2	4	4.0°	29800	Yes	0,19
5988095	VSM17D050Z04S22XD17	50	22	45	40	16,1	4	3.0°	25800	Yes	0,28
5988096	VSM17D050Z05S22XD17	50	22	45	40	16,1	5	3.0°	25800	Yes	0,29
5988134	VSM17D050Z06S22XD17	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

Helical Shell Mills



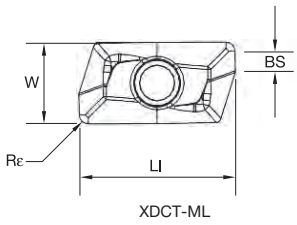




order number	catalogue number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	max RPM	coolant supply
6740674	**VSM17H050Z04S022XD17**	50	22	44	80	60	16	4	3,0°	25600	Yes
6740675	**VSM17H050Z05S022XD17**	50	22	44	80	60	20	5	3,0°	25600	Yes
6740676	**VSM17H063Z04S027XD17**	63	27	60	100	75	20	4	2,1°	22300	Yes
6740677	**VSM17H063Z05S027XD17**	63	27	60	100	75	30	5	2,1°	22300	Yes
6740678	**VSM17H080Z05S032XD17**	80	32	78	100	75	30	5	1,6°	18000	Yes

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

Inserts • XDCT-ML



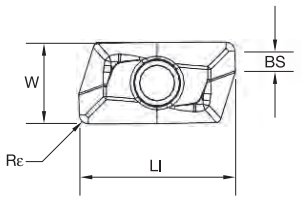
XDCT-ML

● first choice
○ alternate choice

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

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

Inserts • XDCT-ALP



XDCT-ALP

● first choice
○ alternate choice

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

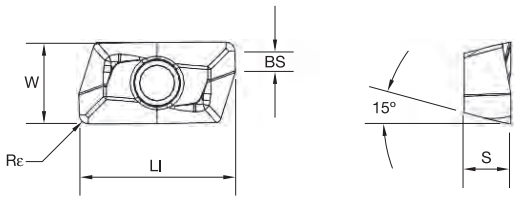
ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WK15CM	WK15PM	WN10HM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XDCT170404PEFRALP	2	19,15	2,62	4,90	9,60	0,40	0,02	■	■	6007341	6007220	■	■	■	■	■
XDCT170408PEFRALP	2	19,15	2,22	4,90	9,60	0,80	0,02	■	■	6007345	6007344	■	■	■	■	■
XDCT170412PEFRALP	2	19,16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



VSM17™

0°/90° Shoulder Mills • VSM17

Inserts • XDPT-MM



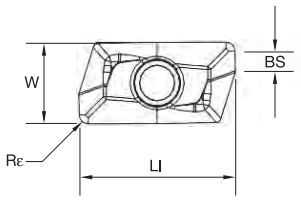
XDPT-MM

● first choice
○ alternate choice

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

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

Inserts • XDPT-MH



XDPT-MH

● first choice
○ alternate choice

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

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

Insert Selection Guide

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

Recommended Starting Speeds [m/min]*

Material Group		WK15CM			WK15PM			WN10HM			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	–	–	–	–	–	–	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	–	–	–	–	–	–	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	–	–	–	–	–	–	–	–	–	–	–	–	120	**90**	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.*

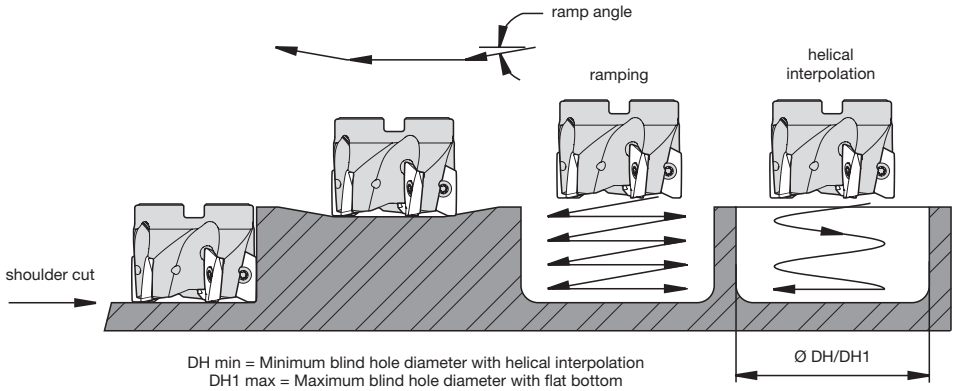
Recommended Starting Feeds [mm]

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	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..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.

Best Practices

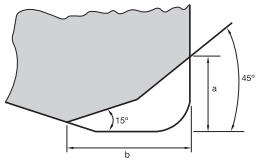


DH min = Minimum blind hole diameter with helical interpolation
DH1 max = Maximum blind hole diameter with flat bottom

cutting diameter (D1)	max RPM	max ramp angle to steel body interference	max flat-bottom hole diameter (DH1 max)	min hole diameter (DH min)
25	41800	8,8°	50	32
32	34700	5,7°	64	46
40	29800	4,0°	80	62
50	25800	3,0°	100	82
63	22400	2,1°	126	108
80	19500	1,6°	160	142
100	17200	1,2°	200	182
125	15200	0,9°	150	132
160	13300	0,7°	320	302

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

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



insert corner radius	material to remove	
	a	b
2,4–4,0mm	2	3
4,0–6,0mm	4	5

NOTE: Standard milling cutters will accept insert nose radii up to 1,6mm without modification.

VSM17 Z-Axis Plunging

cutting diameter (D1)	Z max	Y
25	9	24,00
32	9	28,77
40	9	33,41
50	9	38,42
63	9	44,09
80	9	50,56
100	9	57,24
125	9	64,62
160	9	73,73

