PROVEN SOLUTIONS I ALWAYS AVAILABLE



ALL-STAR

2020

METRIC

WIDIA™

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The All-Star Programme reinforces the core qualities of the WIDIA™ diamond — providing proven solutions that are easy to find and always available.

With All-Star, customers can benefit from product reliability and quick delivery to increase machine utilisation.



ALL-STAR

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PROVEN SOLUTIONS

Products included in the All-Star programme were chosen based on their proven performance and popularity. These industry-leading solutions combine versatility and productivity to deliver savings.

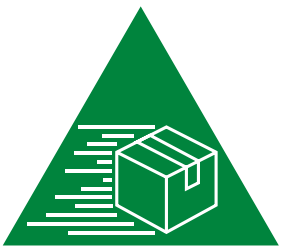


EASY TO FIND

It is easy to recommend All-Star on-the-go or in the shop while using tools like the NOVO™ tool advisor or the Machining Central app. To view All-Star products on widia.com, use the All-Star filter.

Download on the App Store GET IT ON Google Play

Available to download in the app store!



ALWAYS AVAILABLE

All-Star products are held to the highest availability standards. This means products that are flagged as All-Star feature same-day shipping for all orders received before 4pm CET.

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ALL-STAR



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TURNING

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INDEXABLE MILLING

SHOULDER MILLING

Pages A6–A50

VSM890-12™
VSM490-10™
VSM490-15™
VSM11™
VSM17™
M680





90° HIGH-SPEED CUTTING

Pages A52–A57

VHSC

ALL-STAR

FACE MILLING

Pages A58–A81

M1200 Mini
M1200
M640





HIGH-FEED MILLING

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VXF™
M370™



COPY MILLING

Pages A98–A119

M200™
M100™

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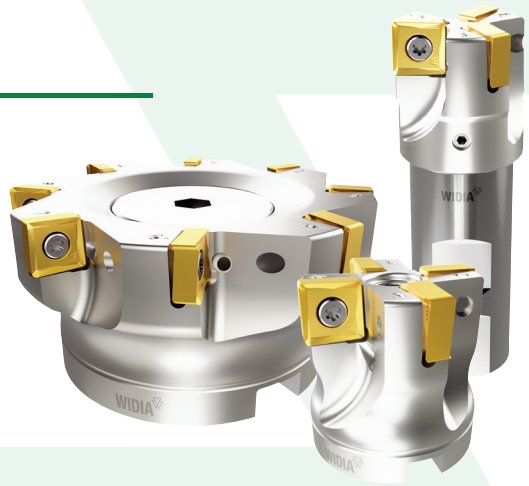
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0°/90° SHOULDER MILLS

VSM890™-12

Pages A6–A9

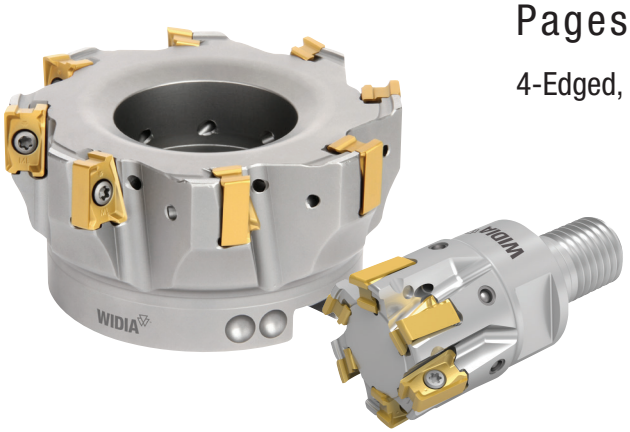
8-Edged, Double-Sided 90° Victory™
Shoulder-Face Mill



VSM490™-10 & VSM490™-15

Pages A10–A24

4-Edged, Double-Sided 90° Victory Shoulder-Face Mill



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VSM11™ & VSM17™

Pages A26–A41

2-Edged, 90° Victory™ Shoulder Mill (VSM)

M680

Pages A42–A50

2-Edged, 90° General Purpose Shoulder Mill Solution



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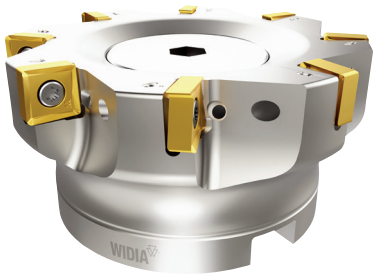
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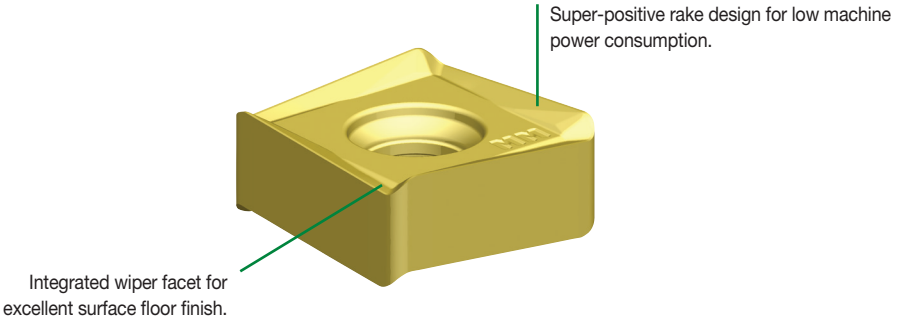
VSM890™

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.
- Comprehensive standard offering for cutter bodies and inserts to address light machining to heavy roughing jobs.
- Available in the new WU10PM™ and WS40PM™ grades.

- Weldon® End Mills
- Shell Mills





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

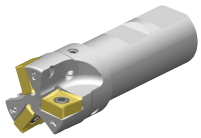
First choice for general purpose in all workpiece materials. Engineered for high-feed rates.

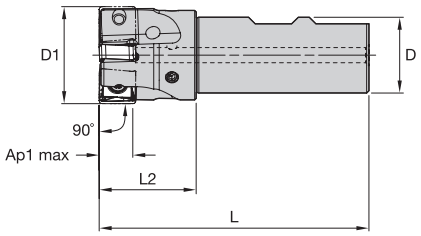
Finishing Capabilities/Lower Cutting Forces

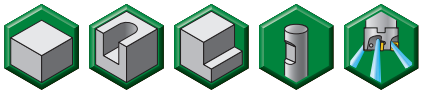
Geometry Strengthening/Stronger Cutting Edge Protection

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Weldon® End Mills • Metric

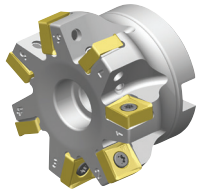


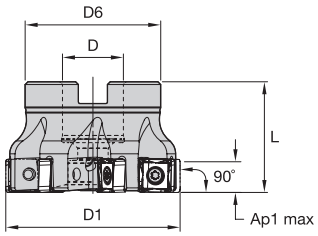


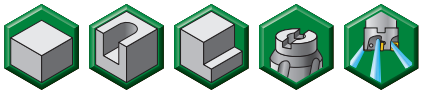


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6596066	VSM890D032Z03B25SN12	32	25	89	32	9,8	3	33200	Yes	0,31

Shell Mills • Metric





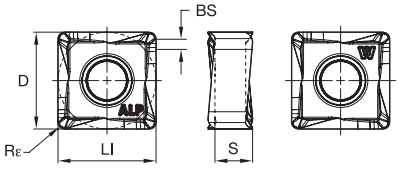


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6596067	VSM890D040Z04S22SN12	40	22	39	40	9,8	4	28000	Yes	0,20
6596069	VSM890D050Z05S22SN12	50	22	49	40	9,8	5	24100	Yes	0,32
6596070	VSM890D063Z05S22SN12	63	22	49	40	9,8	5	20800	Yes	0,48
6596111	VSM890D063Z07S22SN12	63	22	49	40	9,8	7	20800	Yes	0,45
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
6596116	VSM890D100Z08S32SN12	100	32	78	50	9,8	8	15800	Yes	1,56
6596119	VSM890D125Z10S40SN12	125	40	89	63	9,8	10	13900	Yes	2,98

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, INCLUDING SPARE PARTS AND APPLICATION INFORMATION,
VISIT WIDIA NOVO™ OR WIDIA.COM.

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



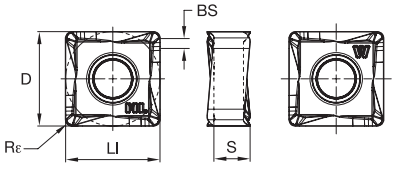


● first choice
○ alternate choice

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

Inserts • SNHX-ML • Precision Finishing and Light Machining



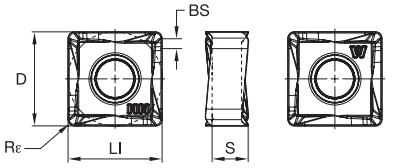


● first choice
○ alternate choice

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

Inserts • SNHX-MM • Universal Geometry for Medium Machining





● first choice
○ alternate choice

ISO catalogue number	cutting edges	LI	S	D	BS	Rε	WK15CM	WP25PM	WP40PM	WS40PM	WU10PM
SNHX120408PNSRMM	8	12,00	4,61	12,00	1,34	0,80	6667462	6596431	6596432	6596433	6596400

Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	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**	–	–

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) 5%			10%			20%			30%			40–100%			Insert Geometry
.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.

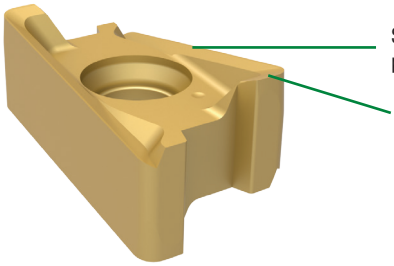
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VSM490™-10

4-Edged, Double-Sided 90° Victory™ Shoulder Mill (VSM)

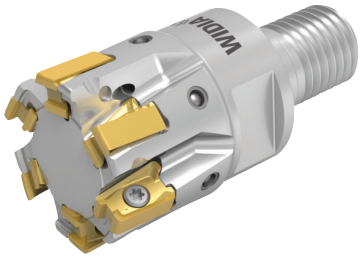
- True 90° roughing tool with embedded finishing capabilities all in one tool.
- Best-in-class wall finish in axial stepping-down jobs.
- Lower cutting forces and real soft cutting action.
- Perfect fit for taper 40 spindles and driven units.

- Screw-On End Mills
- Weldon® End Mills
- Cylindrical End Mills
- Shell Mills
- M4000 Cartridge Milling System



Super-positive rake design for low machine power consumption.

Integrated wiper facet for great surface floor finish.



For non-ferrous materials.

★ -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

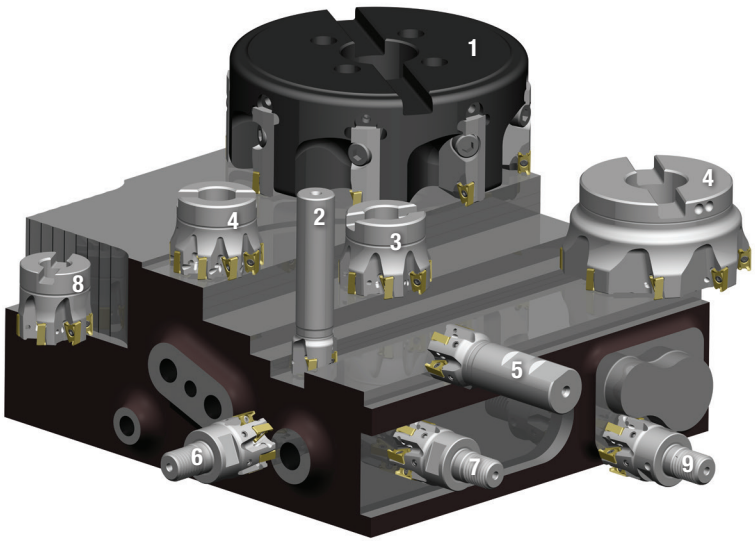
First choice for HPC roughing cast iron. Strongest edge protection with additional margins.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

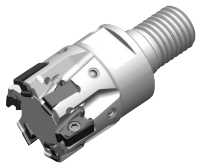
Applications

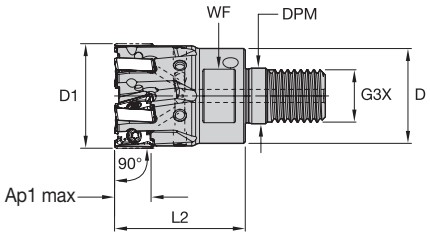
1. Face milling with modular M4000 cartridge milling system.
2. Full slotting with 100% radial engagement.
3. Shoulder milling with step-down capabilities and great wall finish.
4. Shoulder milling with low axial and high radial engagement.
5. Shoulder milling with low radial and high axial engagement.
6. HPC face milling. Excellent choice to clean up castings.
7. Trochoidal slot milling.
8. Z-axis plunge milling.
9. Contour milling.

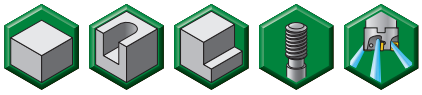


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Screw-On End Mills • Metric



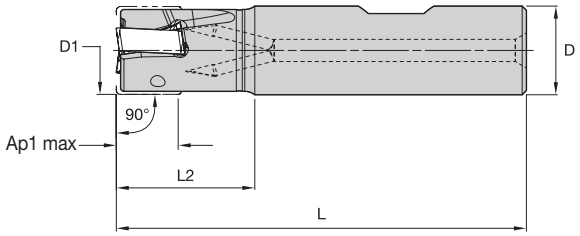




order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
6425553	VSM490D016Z02M08XN10	16	13	8,5	M8	25	10	10,0	2	48000	Yes	0,03
6425554	VSM490D020Z03M10XN10	20	18	10,5	M10	28	15	10,0	3	40200	Yes	0,05
6425555	VSM490D025Z04M12XN10	25	21	12,5	M12	32	17	10,0	4	34300	Yes	0,09
6425556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

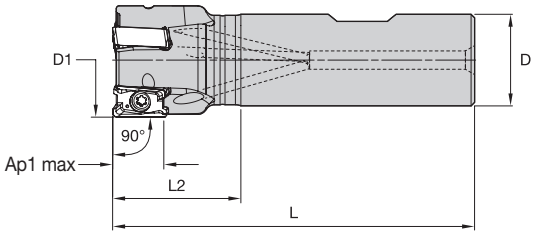
Weldon® End Mills • Metric



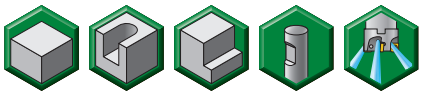


Regular Shank





Reduced Shank



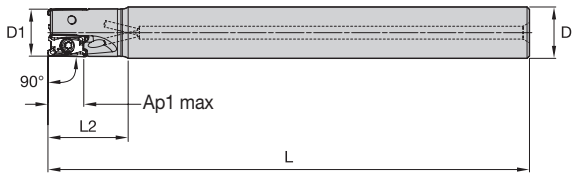
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6425558	VSM490D016Z02B16XN10	16	16	74	25	10,0	2	48000	Yes	0,09
6425559	VSM490D020Z02B20XN10	20	20	79	28	10,0	2	40200	Yes	0,16
6425560	VSM490D020Z03B20XN10	20	20	79	28	10,0	3	40200	Yes	0,16
6425571	VSM490D025Z03B20XN10	25	20	79	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.

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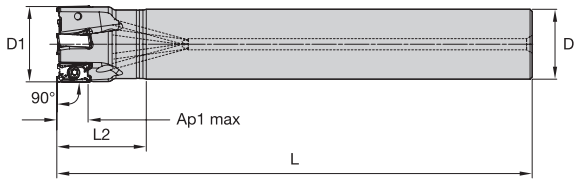
Cylindrical End Mills • Metric



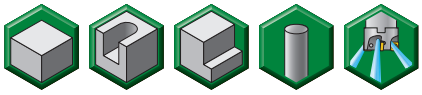


Reduced Shank



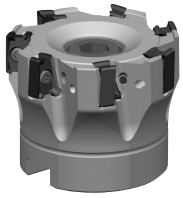


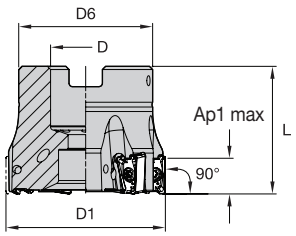
Regular Shank

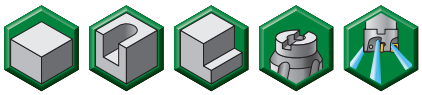


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
6425502	VSM490D016Z02A16XN10L090	16	16	90	25	10,0	2	48000	Yes	0,12
6425503	VSM490D016Z02A16XN10L150	16	16	150	25	10,0	2	48000	Yes	0,21
6425504	VSM490D018Z02A16XN10L150	18	16	150	25	10,0	2	43500	Yes	0,21
6425506	VSM490D020Z02A20XN10L150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

Shell Mills • Metric

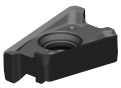


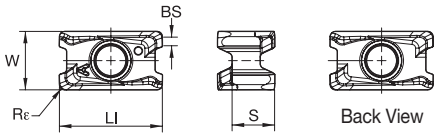




order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
6425434	VSM490D040Z04S16XN10	40	16	37	40	10,0	4	25400	Yes	0,23
6425435	VSM490D040Z06S16XN10	40	16	37	40	10,0	6	25400	Yes	0,23
6425436	VSM490D040Z07S16XN10	40	16	37	40	10,0	7	25400	Yes	0,23
6425437	VSM490D050Z05S22XN10	50	22	42	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

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





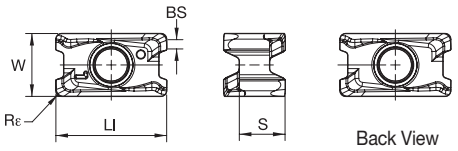
● first choice
○ alternate choice

P	M	K	N	S	H
			●		

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm	WN25PM
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

Inserts • XNGU-ML • Precision Finishing and Light Machining





● first choice
○ alternate choice

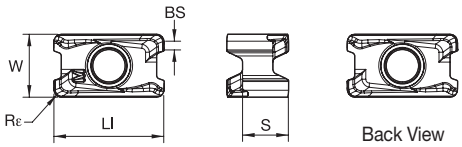
P	M	K	N	S	H
○	●	○		●	
○	●			●	
					●

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm	WP25PM	WS40PM	WU10PM
XNGU100404ERML	4	11,66	4,83	6,60	1,37	0,40	0,02	6425414	6425415	-
XNGU100408ERML	4	11,66	4,83	6,60	1,00	0,80	0,02	6425369	6425370	6425421

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Inserts • XNGU-MM • Universal Geometry for Medium Machining





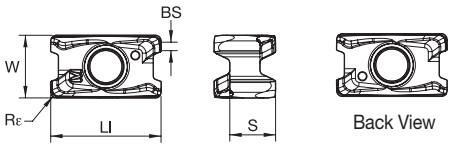
● first choice
○ alternate choice

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

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

Inserts • XNGU-MH • Heavy Roughing



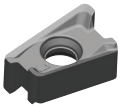


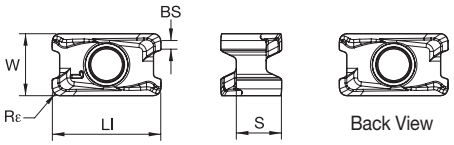
● first choice
○ alternate choice

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

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

Inserts • XNPU-ML • Light Machining



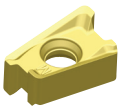


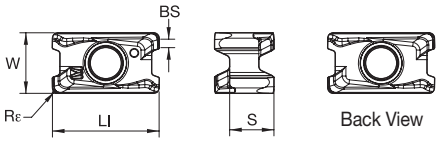
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm	WK15PM	WP25PM	WS40PM
XNPU100408ERML	4	11,60	4,83	6,60	0,90	0,80	0,02	6425366	6425367	6425368

Inserts • XNPU-MM • Universal Geometry for Medium Machining





● first choice
○ alternate choice

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

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

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Insert Selection Guide

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

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.*

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

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

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

= ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

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.

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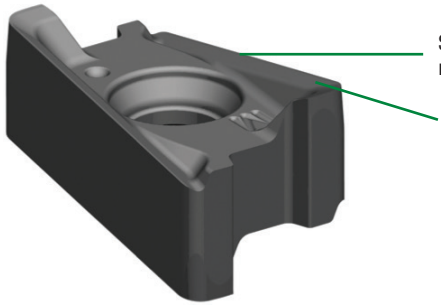
WIDIA™

VSM490™-15

4-Edged, Double-Sided 90° Victory™ Shoulder Mill (VSM)

- True 90° roughing tool with embedded finishing capabilities all in one tool.
- Best-in-class wall finish in axial stepping-down jobs.
- Lower cutting forces and real soft cutting action.
- Perfect fit for taper 50 spindles.
- Coarse, medium, and fine pitch shell mills available.

- Screw-On End Mills
- Weldon® End Mills
- Cylindrical End Mills
- Shell Mills
- M4000 Cartridge Milling System





Four insert geometries for all material groups in shoulder milling applications.

★ -ALP



N

For non-ferrous materials.

★ -ML



P M S

First choice for stainless steel. Lower cutting forces.

★ -MM



P M K S

First choice, especially when machining steels.

★ -MH



P K

First choice for cast iron, and also recommended for heavy applications.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

Wall Quality

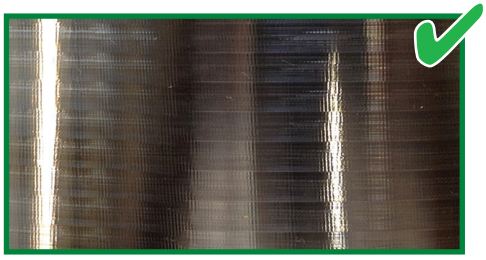
Competitor Tool

Traditional tools are designed to achieve a 0° wall, but exhibit poor performance when machining walls in multiple passes.



VSM490-15

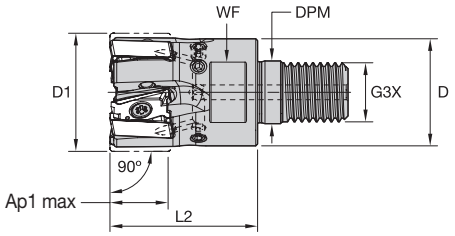
VSM490-15 eliminates the mismatch and minimises the marks left behind in step-down milling operations. By increasing wall quality and avoiding a second tool, productivity increases significantly.

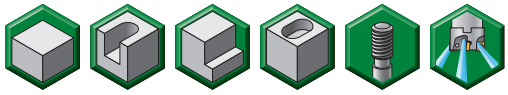


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Screw-On End Mills • Metric



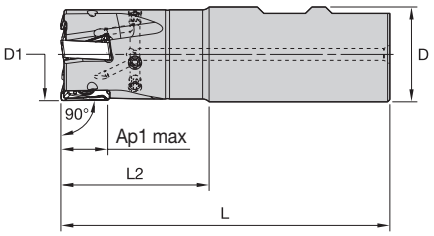


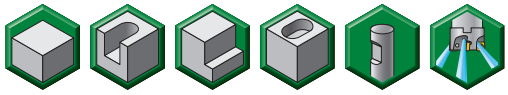


order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
5873211	VSM490D025Z02M12XN15	25	21	12,5	M12	32	17	15,0	2	26700	Yes	0,18
5873212	VSM490D032Z03M16XN15	32	29	17,0	M16	40	24	15,0	3	22000	Yes	0,18
5873213	VSM490D032Z04M16XN15	32	29	17,0	M16	40	24	15,0	4	22000	Yes	0,18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

Weldon® End Mills • Metric





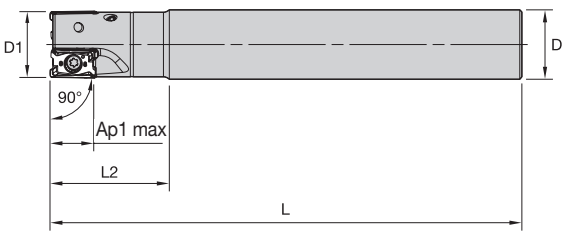


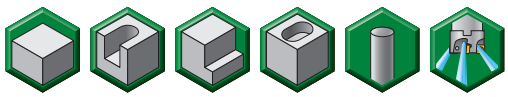
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
5710285	VSM490D025Z02B25XN15	25	25	89	32	15,0	2	26700	Yes	0,28
5710286	VSM490D032Z03B32XN15	32	32	111	50	15,0	3	22000	Yes	0,58
5873215	VSM490D040Z03B32XN15	40	32	111	50	15,0	3	18800	Yes	0,65

NOTE: Weldon type not recommended for finishing operations.

Cylindrical End Mills • Metric

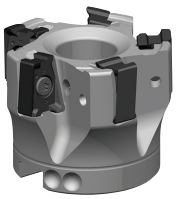


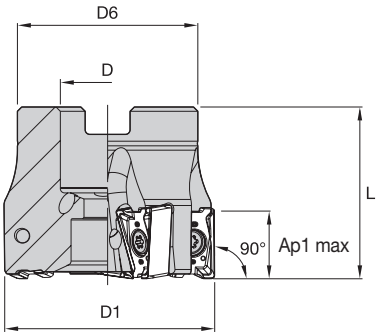


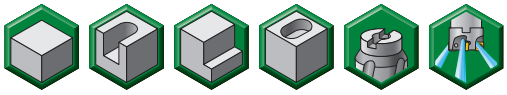


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
5873216	VSM490D025Z02A25XN15L100	25	25	100	43	15,0	2	26700	Yes	0,32
5710287	VSM490D025Z02A25XN15L170	25	25	170	43	15,0	2	26700	Yes	0,59
5873217	VSM490D032Z03A32XN15L110	32	32	110	49	15,0	3	22000	Yes	0,59
5710288	VSM490D032Z03A32XN15L200	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

Shell Mills • Metric

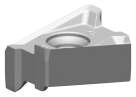


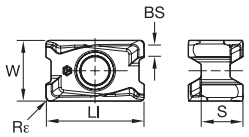




order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
5710289	VSM490D040Z04S16XN15	40	16	37	40	15,0	4	18800	Yes	0,20
5710520	VSM490D040Z05S16XN15	40	16	37	40	15,0	5	18800	Yes	0,19
5873221	VSM490D050Z04S22XN15	50	22	42	40	15,0	4	16300	Yes	0,28
5710521	VSM490D050Z05S22XN15	50	22	42	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

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



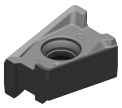


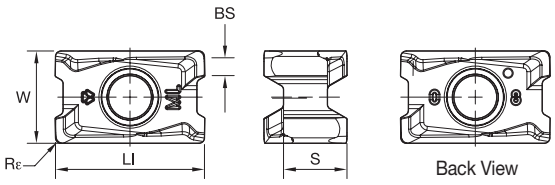
● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm	WN25PM
XNGU15T604ERALP	4	16,20	6,88	10,00	2,20	0,40	0,03	6082644
XNGU15T608ERALP	4	16,20	6,88	10,00	1,80	0,80	0,03	6082645

Inserts • XNGU-ML • Precision Finishing and Light Machining





● first choice
○ alternate choice

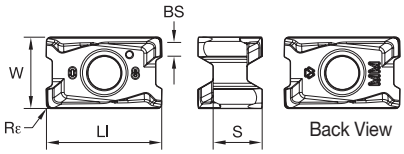
P	○	●	○	●
M	●	●	●	●
K	○			
N				
S	●	○	●	●
H				

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

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Inserts • XNGU-MM • Universal Geometry for Medium Machining



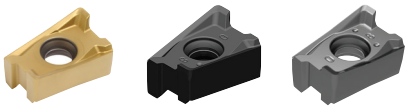


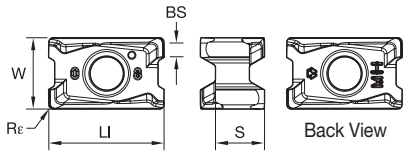
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm					
XNGU15T604SRMM	4	16,20	6,88	10,00	2,20	0,40	0,10	-	6242521	5949204	5949205	5949206
XNGU15T608SRMM	4	16,20	6,88	10,00	1,90	0,80	0,10	-	6242522	5710527	5710528	5710529
XNGU15T612SRMM	4	16,20	6,88	10,00	1,50	1,20	0,08	6234707	-	-	-	-

Inserts • XNGU-MH • Heavy Roughing



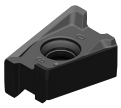


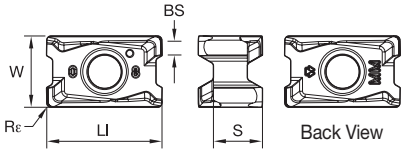
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	hm						
XNGU15T608SRMH	4	16,20	6,88	10,00	1,80	0,80	0,10	6003725	6003724	6003570	6003723	6003721	6003722
XNGU15T616SRMH	4	16,20	6,88	10,00	1,00	1,60	0,10	6030380	6030378	6030376	6030377	-	-

Inserts • XNPU-ML • Light Machining



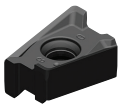


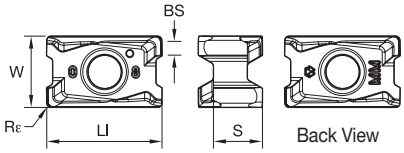
● first choice
○ alternate choice

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

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

Inserts • XNPU-MM • Universal Geometry for Medium Machining





● first choice
○ alternate choice

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

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

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Insert Selection Guide

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

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	–	–	–	–	–	–	–	–	–	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]

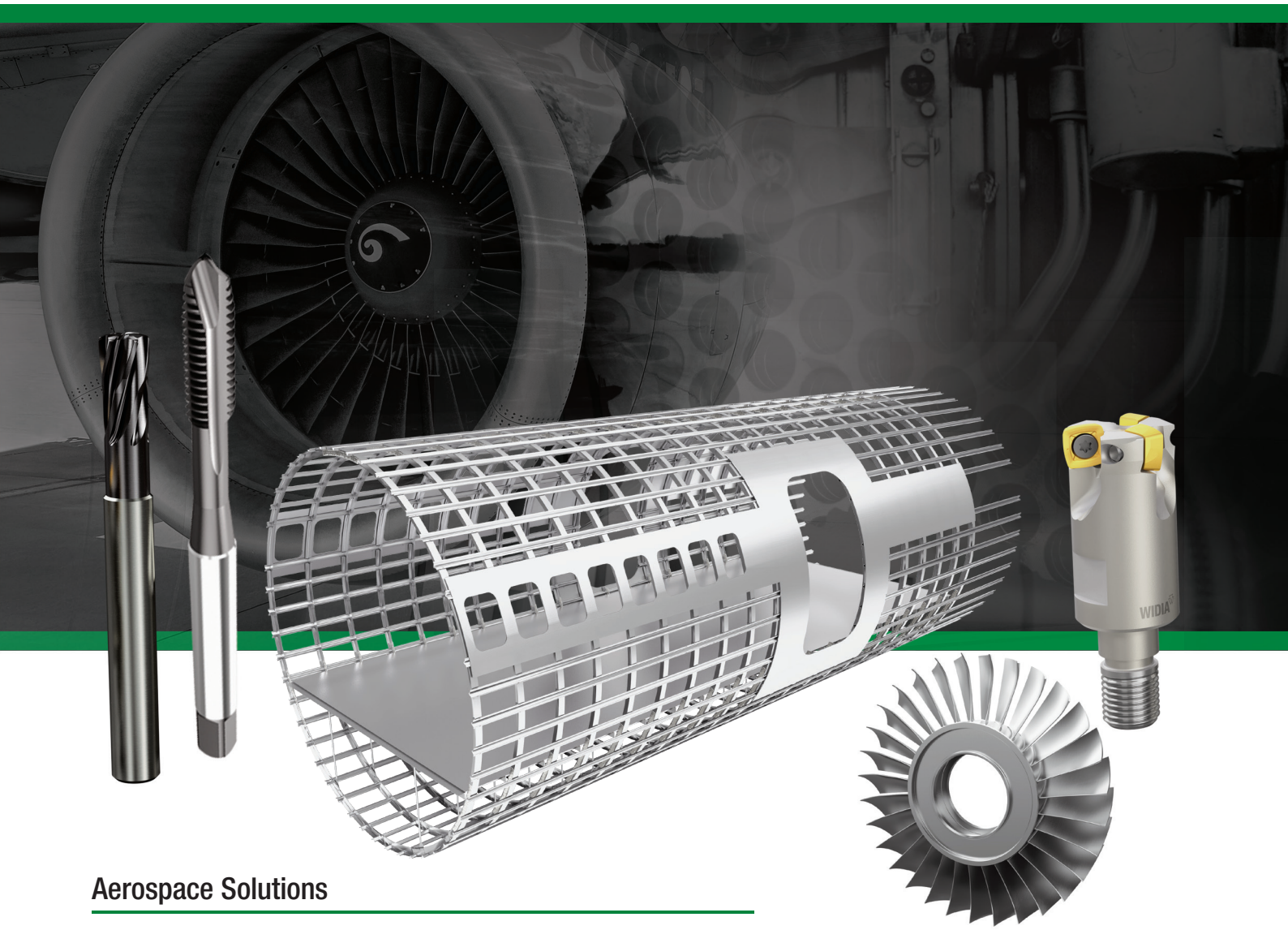
Light Machining	General Purpose	Heavy Machining

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

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

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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

*Visit **widia.com** to learn more about our new tooling and machining strategies from WIDIA machining experts.*

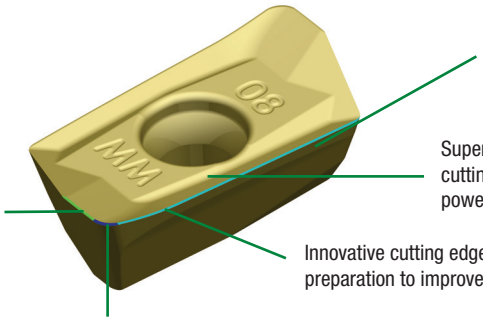
WIDIA™ GTD™ WIDIA™ WIDIA™ HANITA™

VSM11™

2-Edged, 90° Victory™ Shoulder Mill (VSM)

- True 90° shoulder milling platform.
- 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.

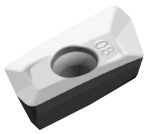
- Screw-On End Mills
- Weldon® End Mills
- Cylindrical End Mills
- Shell Mills
- M4000 Cartridge Milling System





Geometries for all material groups in shoulder milling applications.

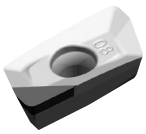
★ -ALP



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

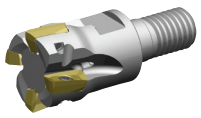
First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

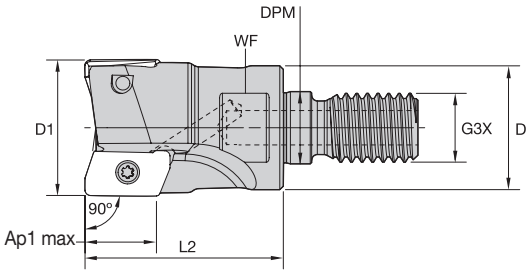
Finishing Capabilities/Lower Cutting Forces

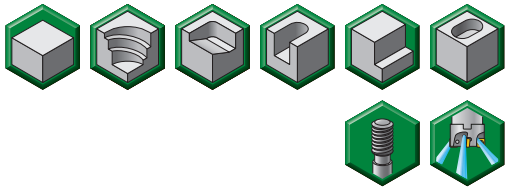
Geometry Strengthening

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Screw-On End Mills • Metric



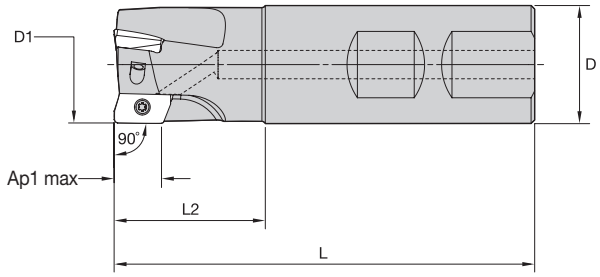


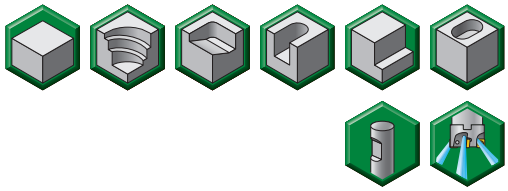


order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5417011	VSM11D016Z02M08XD11	16	13	8,5	M8	25	10	11,5	2	10.0°	41400	Yes	0,02
5417013	VSM11D020Z03M10XD11	20	18	10,5	M10	28	15	11,6	3	7.8°	35100	Yes	0,05
5417015	VSM11D025Z04M12XD11	25	21	12,5	M12	32	17	11,5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







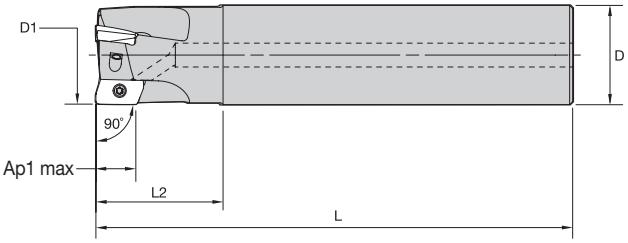
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416454	VSM11D012Z01B16XD11	12	16	70	21	11,7	1	3.7°	53100	Yes	0,08
5416455	VSM11D016Z02B16XD11	16	16	70	21	11,5	2	10.0°	41400	Yes	0,09
5416457	VSM11D020Z02B20XD11	20	20	81	30	11,6	2	7.8°	35100	Yes	0,15
5416458	VSM11D020Z03B20XD11	20	20	81	30	11,6	3	7.8°	35100	Yes	0,16
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
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

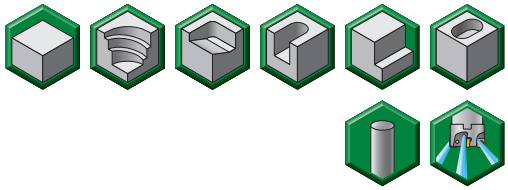
NOTE: Weldon type not recommended for finishing operations.

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Cylindrical End Mills (Regular and Long Version) • Metric



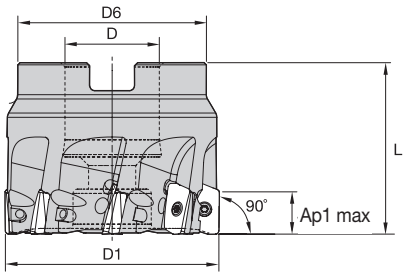


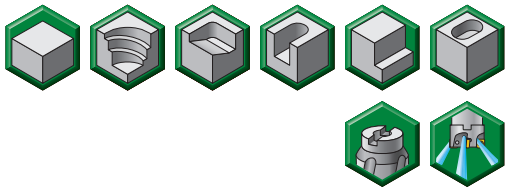


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416632	VSM11D012Z01A16XD11L100	12	16	100	25	11,7	1	3.7°	53100	Yes	0,13
5416633	VSM11D016Z02A16XD11L100	16	16	100	31	11,5	2	10.0°	41400	Yes	0,12
5416700	VSM11D016Z02A16XD11L170	16	16	170	25	11,5	2	10.0°	41400	Yes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



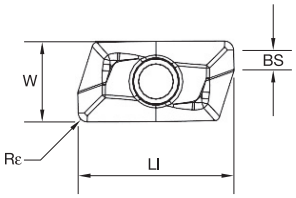




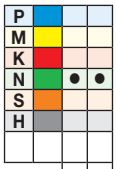
order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5416316	VSM11D040Z04S016XD11	40	16	37	40	11,4	4	2.6°	22600	Yes	0,22
5416317	VSM11D040Z06S016XD11	40	16	37	40	11,4	6	2.6°	22600	Yes	0,22
5416318	VSM11D050Z05S022XD11	50	22	44	40	11,3	5	1.9°	19900	Yes	0,33
5416319	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

Inserts • XDCT-ALP



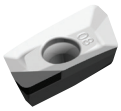


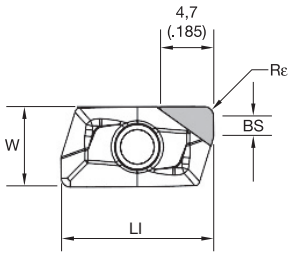
● first choice
○ alternate choice



ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WN10HM	WN25PM
XDCT110404PDFRALP	2	13,43	2,09	4,00	6,90	0,40	0,02	5933940	5417054
XDCT110408PDFRALP	2	13,44	1,69	4,00	6,90	0,80	0,02	5936171	5417053

Inserts • XDCW-PCD





● first choice
○ alternate choice

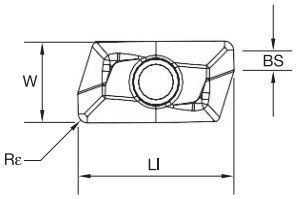


ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WDN10U
XDCW110404PDFRPCD	1	13,41	2,22	4,00	6,90	0,40	0,02	5415420
XDCW110408PDFRPCD	1	13,42	1,80	4,00	6,90	0,80	0,02	5415421

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Inserts • XDCT-ML





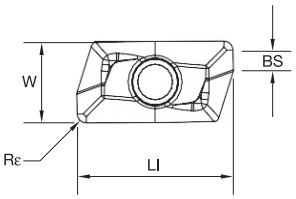
● first choice
○ alternate choice

								WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
P			○	●	●		○	●						
M			●	○	●		●	●						
K		●	○	○										
N														
S			●		○	●	●	●						
H														

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm							
XDCT110432PDERML	2	12,86	–	4,00	6,89	3,20	–	-	-	-	-	-	6408007	-
XDCT110404PDERML	2	13,43	2,09	4,00	6,90	0,40	0,04	-	5536671	5536670	5642230	-	6180174	-
XDCT110408PDERML	2	13,44	1,69	4,00	6,90	0,80	0,04	5415549	5415548	5415547	5545065	5517826	6180173	5415546
XDCT110412PDERML	2	13,44	1,29	4,00	6,90	1,20	–	-	-	-	-	-	6408002	-
XDCT110416PDERML	2	13,44	0,88	4,00	6,89	1,60	0,04	-	5964861	-	5964810	-	6408004	-
XDCT110424PDERML	2	13,44	0,16	4,00	6,88	2,40	–	-	-	-	-	-	6408006	-

Inserts • XDPT-MM





● first choice
○ alternate choice

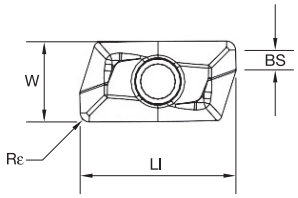
P			○	●	●		○	●							
M			●	○	●		●	●							
K		●	○	○											
N															
S			●		○	●	●	●							
H															

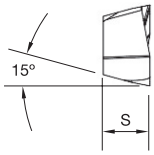
ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM	WU35PM
XDPT110431PDSRMM	2	12,94	–	4,01	6,94	3,10	0,06	5415422	5415426	5415425	5642234	5517827	6279204	-
XDPT110424PDSRMM	2	13,37	–	4,01	6,94	2,40	0,06	-	5901355	-	5901354	-	6408096	-
XDPT110412PDSRMM	2	13,44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

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Inserts • XDPT-MH







● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WK15CM	WP35CM	WP40PM	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**	–	–

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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.

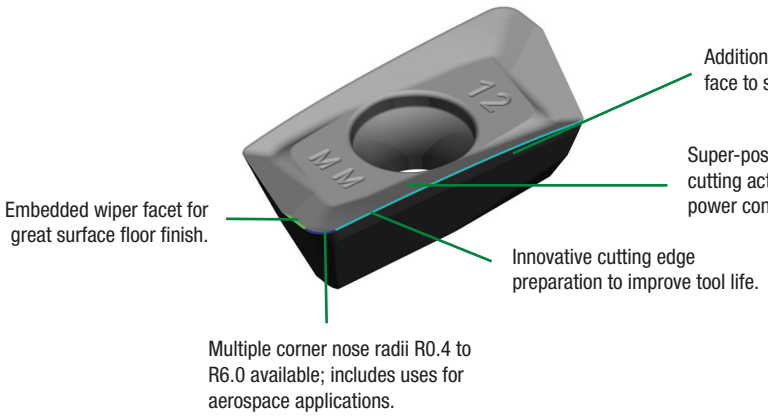
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VSM17™

2-Edged, 90° Victory™ Shoulder Mill (VSM)

- True 90° shoulder milling platform.
- 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.

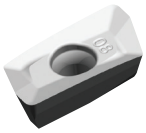
- Screw-On End Mills
- Weldon® End Mills
- Cylindrical End Mills
- Shell Mills
- M4000 Cartridge Milling System





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

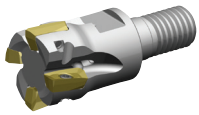
First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

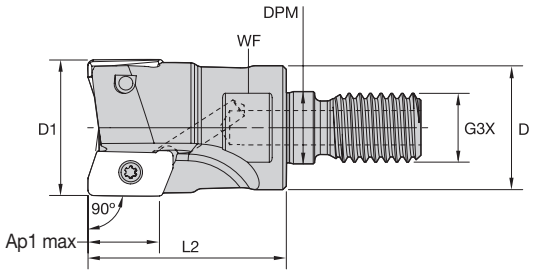
Finishing Capabilities/Lower Cutting Forces

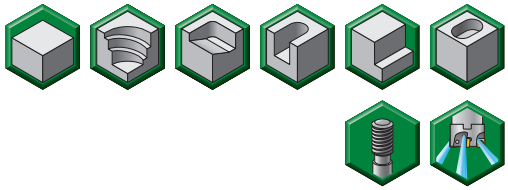
Geometry Strengthening

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Screw-On End Mills • Metric



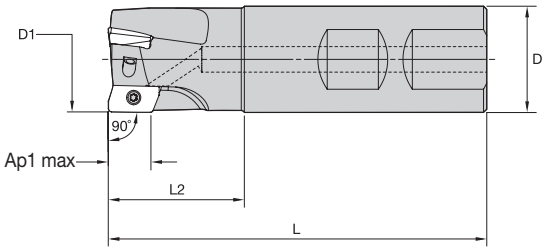


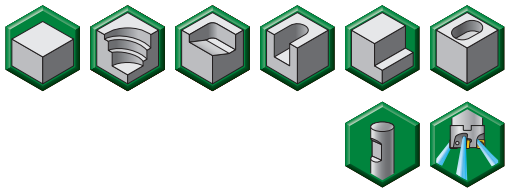


order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988091	VSM17D025Z02M12XD17	25	21	12,5	M12	35	17	16,4	2	8.8°	41800	Yes	0,08
5988092	VSM17D032Z03M16XD17	32	29	17,0	M16	40	24	16,3	3	5.7°	34700	Yes	0,17
5988131	VSM17D40Z03M016XD17	40	29	17,0	M16	40	24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







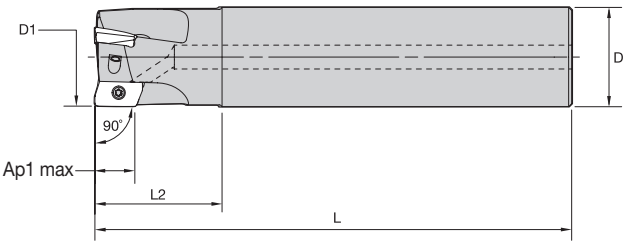
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988102	VSM17D025Z02B25XD17	25	25	90	33	16,4	2	8.8°	41800	Yes	0,26
5988103	VSM17D032Z03B32XD17	32	32	100	39	16,3	3	5.7°	34700	Yes	0,48
5988104	VSM17D040Z04B40XD17	40	40	110	39	16,2	4	4.0°	29800	Yes	0,87

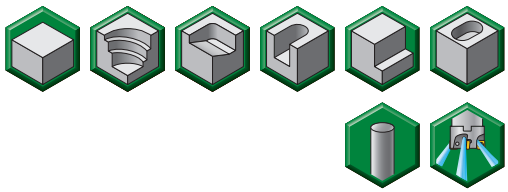
NOTE: Weldon type not recommended for finishing operations.

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Cylindrical End Mills (Regular and Long Version) • Metric



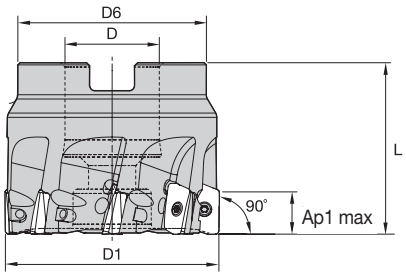


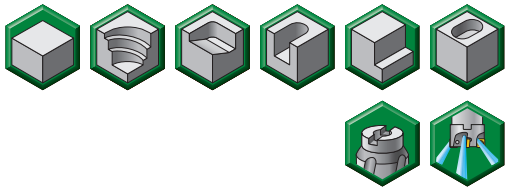


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988055	VSM17D025Z02A25XD17L110	25	25	110	44	16,4	2	8.8°	41800	Yes	0,32
5988056	VSM17D025Z02A25XD17L170	25	25	170	44	16,4	2	8.8°	41800	Yes	0,54
5988107	VSM17D032Z02A32XD17L120	32	32	120	50	16,3	2	5.7°	34700	Yes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



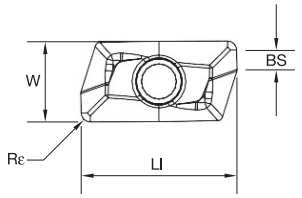


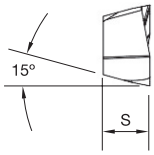


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
5988094	VSM17D040Z04S16XD17	40	16	37	40	16,2	4	4.0°	29800	Yes	0,19
5988095	VSM17D050Z04S22XD17	50	22	45	40	16,1	4	3.0°	25800	Yes	0,28
5988096	VSM17D050Z05S22XD17	50	22	45	40	16,1	5	3.0°	25800	Yes	0,29
5988134	VSM17D050Z06S22XD17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

Inserts • XDCT-ML







● first choice
○ alternate choice

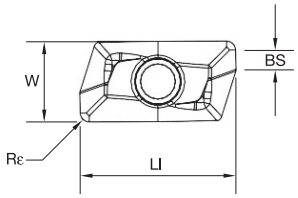
P		○	●	●	○
M		●	○	●	●
K		○	○		
N					
S		●		○	●
H					

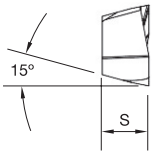
ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WP25PM	WP35CM	WP40PM	WS40PM
XDCT170460PEERML	2	17,02	–	4,80	9,56	6,00	0,04	-	-	-	6232053
XDCT170440PEERML	2	18,33	–	4,87	9,59	4,00	0,04	6001239	-	-	6425266
XDCT170432PEERML	2	18,85	–	4,89	9,59	3,20	0,04	6001251	-	-	6425265
XDCT170404PEERML	2	19,15	2,62	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

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Inserts • XDCT-ALP







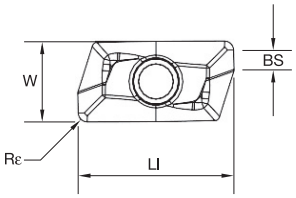
● first choice
○ alternate choice

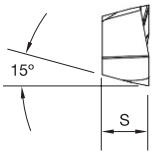
P		
M		
K		
N	●	●
S		
H		

ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WN10HM	WN25PM
XDCT170440PEFRALP	2	18,33	–	4,87	9,59	4,00	0,02	-	6001238
XDCT170432PEFRALP	2	18,85	–	4,88	9,59	3,20	0,02	-	6001240
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

Inserts • XDPT-MM







● first choice
○ alternate choice

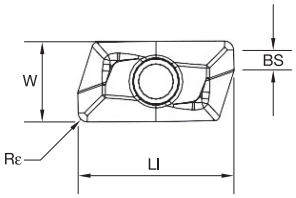
P			○	●	●	○	●						
M			●	○	●	●	●						
K			○	○									
N		●											
S			●		○	●	●						
H													

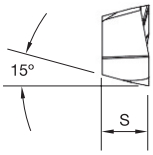
ISO catalogue number	cutting edges	LI	BS	S	W	Rε	hm	WK15CM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XDPT170440PESRMM	2	18,33	–	4,87	9,59	4,00	0,10	-	5988970	-	5988969	6425147	-
XDPT170432PESRMM	2	18,85	–	4,89	9,59	3,20	0,10	-	5988206	5988204	5988205	-	-
XDPT170404PESRMM	2	19,15	2,52	4,90	9,60	0,40	0,10	-	-	-	5987689	-	5987690
XDPT170408PESRMM	2	19,15	2,15	4,90	9,60	0,80	0,10	5987948	5987949	5987947	5987946	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	-

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Inserts • XDPT-MH







● first choice
○ alternate choice

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

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

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Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	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) 5%			10%			20%			30%			40–100%			Insert Geometry
.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.

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M680

General-Purpose shoulder milling solution for a large selection of geometries and grades.

- Wide selection of inserts to machine all material types.
- Pockets designed for optimal accuracy with 90º shoulders.
- Strong inserts providing high reliability.

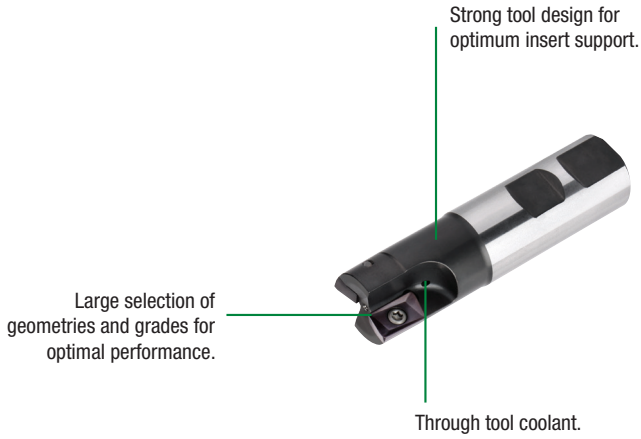
Materials:

P M K N S

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

Max depth of cut: 14,0mm

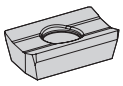
Diameter: 25–160mm





Geometries for all material groups in shoulder milling applications.

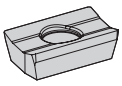
★- ALP



N

First choice for aluminium and non-ferrous alloy machining. ALP geometry has a polished rake face for optimum chip flow and lowest adhesion.

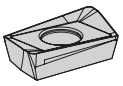
★-AL



N

Additional choice for aluminium and non-ferrous alloy machining.

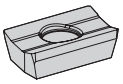
★-ERGE



P M K S

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

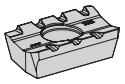
★-XP..16



P M K S

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

★-MR



P M K S

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

Finishing Capabilities/Lower Cutting Forces

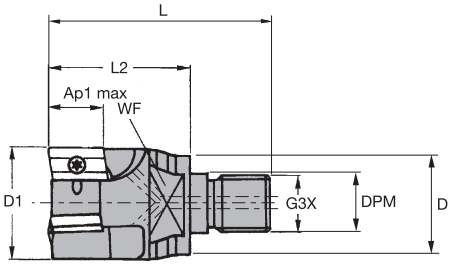
Geometry Strengthening

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Screw-On End Mills • Metric



Insert Style XP.T16





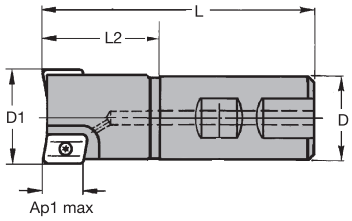
order number	catalogue number	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
2003517	**12396933000**	32	28	17,0	M16	63	40	22	14,0	3	7800	Yes	0,30

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

Weldon® End Mills • Metric



Insert Style XP.T16





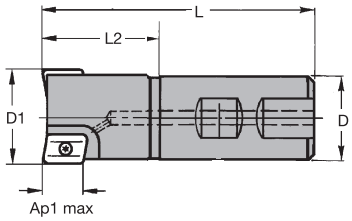
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2003475	**12396922600**	25	25	96	39	14,0	2	17600	Yes	0,30

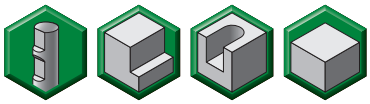
NOTE: Standard milling cutters will accept insert nose radii up to 2mm without modification.

Weldon® End Mills • Metric



Insert Style XD.T09



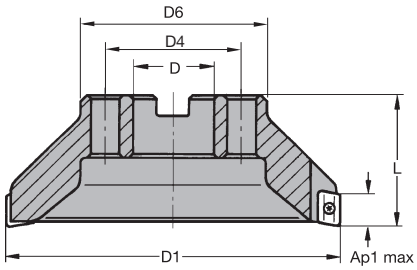


order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2002366	**12396920400**	16	16	75	27	9,0	2	28000	No	0,1
2002369	**12396920600**	20	20	82	32	9,0	2	27000	Yes	0,3

Shell Mills • Metric



Insert Style XP.T16

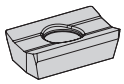


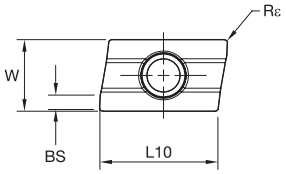


order number	catalogue number	D1	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2003535	**12396903600**	40	22	—	39	45	15,3	4	14000	Yes	0,23
2003553	**12396903800**	50	22	—	42	40	14,0	4	12500	Yes	0,30
2003554	**12396904000**	50	22	—	42	40	14,0	5	12500	Yes	0,30
2003561	**12396904200**	63	22	—	50	40	14,0	5	11000	Yes	0,50
2003578	**12396904600**	80	27	—	60	50	14,0	6	9500	Yes	1,00
2003594	**12396905000**	100	32	—	78	50	14,0	8	8500	No	1,40

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

Inserts • XDHT



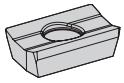


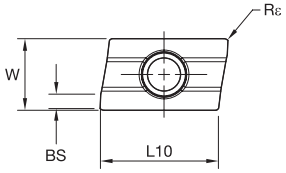
● first choice
○ alternate choice

P	●	●
M	○	○
K		○
N		●
S		○
H		

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	TN7525	TN7535	THM
XDHT090308	2	6,35	9,47	3,18	1,00	0,80	0,04	2030395	2030380	2025281

Inserts • XDHT-AL





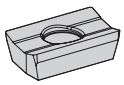
● first choice
○ alternate choice

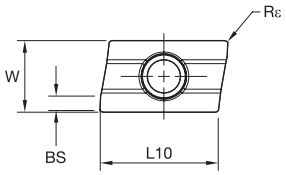
P		
M		
K		○
N		●
S		○
H		

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	THM
XDHT090308AL	2	6,71	9,46	3,08	1,00	0,80	0,02	2031793

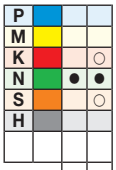
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Inserts • XPHT-AL



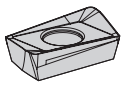


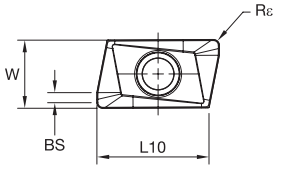
● first choice
○ alternate choice



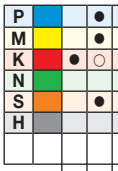
ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	TN6502	THM
XPHT160408AL	2	9,80	15,67	4,66	1,70	0,80	0,08	2963902	2031796
XPHT160412AL	2	9,80	15,67	4,66	1,40	1,20	0,08	-	2031798
XPHT160416AL	2	9,80	15,67	4,66	0,90	1,60	0,08	-	2031801
XPHT160425AL	2	9,80	15,67	4,66	1,20	2,50	0,08	-	2029067
XPHT160432AL	2	9,80	15,67	4,66	1,20	3,17	0,08	-	2031804

Inserts • XPHT-ERGE



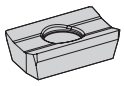


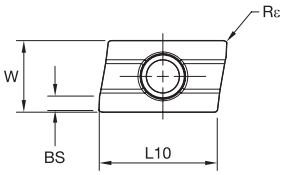
● first choice
○ alternate choice



ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	TN6510	TN6540	TN7525	TN7535	WK15CM
XPHT160408ERGE	2	9,44	15,67	4,76	1,80	0,80	0,12	2964172	2964170	2405300	2405301	5427399
XPHT160412ERGE	2	9,44	15,67	4,76	1,50	1,20	0,12	-	2964179	2405345	2405346	-

Inserts • XPHT





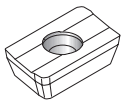
● first choice
○ alternate choice

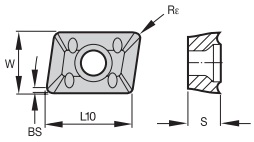
		PA120	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	THM	WK15CM	WP40PM
P		●			●	●	●	●			●
M		●			○	●	○	○			○
K		●	●	●	○	○			○	●	
N									●		
S						●			○		
H											

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	PA120	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	THM	WK15CM	WP40PM
XPHT160408	2	9,53	15,67	4,76	1,80	0,80	0,16	2562061	-	-	-	2964164	-	2029043	-	5427389	-
XPHT160412	2	9,53	15,67	4,76	1,50	1,20	0,16	2562092	2964169	2964167	2964180	2964165	2030341	2030336	2025362	5427396	5645178
XPHT160416	2	9,53	15,67	4,76	0,80	1,60	0,16	-	-	-	-	-	2029062	-	-	-	-
XPHT160420	2	9,53	15,67	4,76	0,50	2,00	0,16	-	-	-	-	-	2029064	2030358	-	-	-
XPHT160425	2	9,53	15,67	4,76	1,20	2,50	0,16	-	-	-	-	-	-	2030360	-	5427392	-
XPHT160432	2	9,53	15,67	4,76	1,20	3,17	0,16	-	-	-	-	-	-	2030373	-	-	-
XPHT160440	2	9,53	15,67	4,76	1,20	4,00	0,16	-	-	-	-	-	-	2030375	-	-	-

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Inserts • XPNT



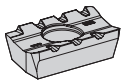


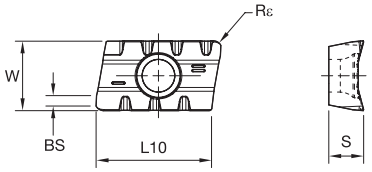
● first choice
○ alternate choice

P	●	●	
M	●	○	
K	○	○	●
N			
S	●		
H			

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	TN6540	TN7535	WK15CM
XPNT160412	2	9,53	15,88	4,79	1,20	1,20	0,16	2964174	2030319	5427395

Inserts • XPHT-MR



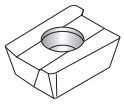


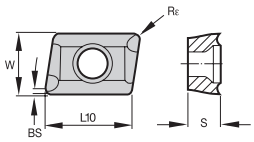
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	TN6540	TN7525	TN7535	WK15CM
XPHT160412MR	2	9,53	15,67	4,76	1,70	1,20	0,18	2964142	2029058	2030378	5427390

Inserts • AONT-MM





● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	W	L10	S	BS	Rε	hm	TN7525	TN7535	WK15CM
AONT10T308MM	2	7,54	10,44	3,97	1,00	0,80	0,10	2031644	2030453	6118214

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Recommended Starting Speeds [m/min]

Material Group		PA120			THM-U			TN6501			TN6502			TN6510			TN6520			TN6525			TN6540		
P	0	330	**285**	270	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	1	330	**285**	270	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340	**265**	235	300	**235**	200
	2	275	**240**	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	265	**210**	180	210	**160**	140
	3	255	**215**	175	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	235	**180**	155	180	**140**	115
	4	225	**185**	150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	195	**140**	120	150	**110**	90
	5	185	**170**	150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	260	**195**	165	200	**150**	125
	6	165	**125**	100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	170	**135**	110	135	**100**	85
M	1	205	**180**	165	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	160	**100**	65	110	**65**	50
	2	185	**160**	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	**65**	40	65	**40**	35
	3	140	**120**	95	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	105	**65**	45	70	**40**	35
K	1	230	**205**	185	190	**170**	150	–	–	–	–	–	–	400	**290**	215	375	**265**	190	230	**205**	185	185	**170**	150
	2	180	**160**	150	–	–	–	–	–	–	–	–	–	350	**235**	170	325	**210**	160	180	**160**	150	145	**130**	115
	3	150	**135**	120	–	–	–	–	–	–	–	–	–	280	**215**	165	250	**190**	135	150	**135**	120	130	**120**	105
N	1	–	–	–	2000	**1200**	1000	2000	**1200**	1000	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	1365	**815**	665	1365	**815**	665	1075	**945**	875	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	800	**500**	400	800	**500**	400	945	**875**	760	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**30**	25
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	**15**	10
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	**35**	25
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**25**	20
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TN7525			TN7535			TTI25			THM			WK15CM			WP40PM			WS30PM		
P	0	340	**260**	235	455	**395**	370	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	1	340	**260**	235	455	**395**	370	360	**300**	250	–	–	–	–	–	–	295	**260**	245	–	–	–
	2	260	**210**	180	280	**255**	230	260	**210**	180	–	–	–	–	–	–	250	**215**	180	–	–	–
	3	235	**180**	155	255	**230**	205	260	**210**	180	–	–	–	–	–	–	230	**195**	160	–	–	–
	4	195	**140**	120	190	**175**	160	220	**180**	150	–	–	–	–	–	–	205	**170**	135	–	–	–
	5	260	**195**	165	260	**230**	210	265	**195**	165	–	–	–	–	–	–	170	**155**	135	–	–	–
	6	170	**135**	110	160	**135**	110	120	**90**	75	–	–	–	–	–	–	150	**115**	90	–	–	–
M	1	205	**185**	155	205	**185**	155	400	**260**	180	–	–	–	–	–	–	195	**170**	155	225	**200**	185
	2	185	**160**	140	185	**160**	140	270	**170**	120	–	–	–	–	–	–	175	**150**	125	205	**180**	145
	3	145	**130**	115	145	**130**	115	265	**175**	120	–	–	–	–	–	–	130	**115**	90	155	**135**	105
K	1	315	**235**	200	295	**265**	240	185	**155**	130	–	–	–	420	**385**	340	–	–	–	–	–	–
	2	270	**200**	165	235	**210**	190	150	**120**	105	–	–	–	335	**295**	275	–	–	–	–	–	–
	3	200	**165**	140	195	**175**	160	120	**105**	85	–	–	–	280	**250**	230	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	795	**695**	600	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	560	**485**	420	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	**35**	30	45	**40**	30
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**45**	30
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	65	**50**	35	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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.

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90° HIGH-SPEED CUTTING MILLS

VHSC

Pages A54–A57

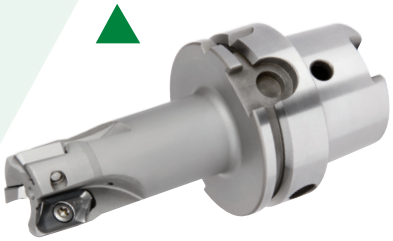
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VHSC milling tools are designed for true HSC pocketing and profiling of aluminium alloy components in the aerospace industry, making it a first choice for components like airframe floor brackets.

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VHSC

High-speed cutter for aluminium components

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- Latest cutter body technology allows for heavy feeding and ramping.
- Flutes and internal coolant channels engineered to support improved chip evacuation.
- Best-in-class solution for thin-walled machining.
- Productivity booster up to 8600cm^3/min MRR.
- First choice for non-ferrous materials.
- Wear-resistant micro-grain carbide grade on inserts.

- High-Speed Cutting Cylindrical End Mills
- High-Speed Cutting Monoblocks
- High-Speed Shell Mills



High-Speed Cutting Inserts XDET-ALP

★ **FR-ALP**



N

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

★ **ER-ALP**



N

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

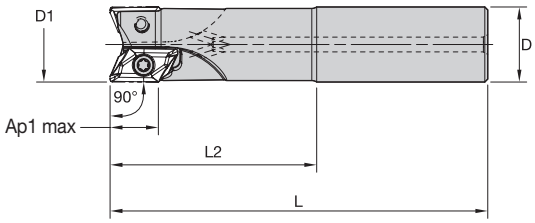
Finishing Capabilities/Lower Cutting Forces

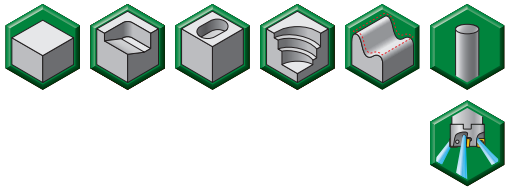
Geometry Strengthening

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Cylindrical End Mills • Metric



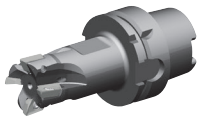


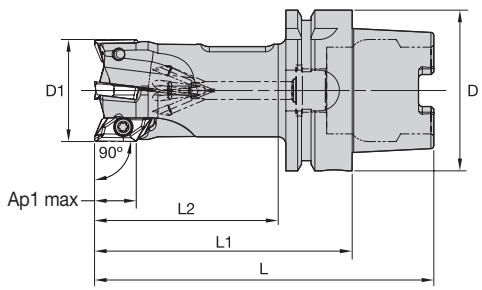


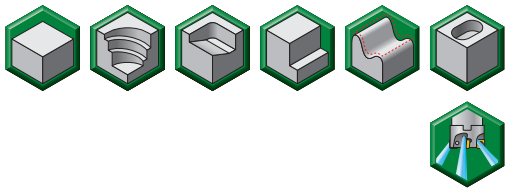
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425258	VHSC025Z02A25XD16	25	25	131	75	16	2	14.7°	50000	Yes	0,39

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

Monoblocks • Metric



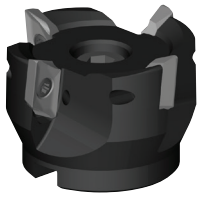


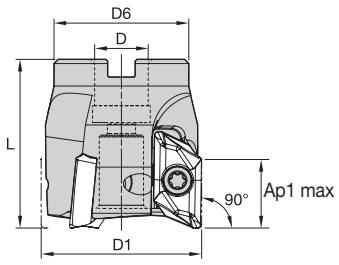


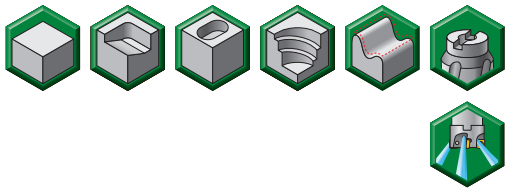
order number	catalogue number	D1	D	L	L1	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425451	VHSC040Z04HSK63XD16	40	63	133	101	75	16	4	7.8°	35000	Yes	1,09
6425453	VHSC050Z04HSK63XD16	50	63	133	101	75	15	4	7.9°	30000	Yes	1,41

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

Shell Mills • Metric

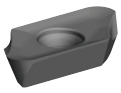


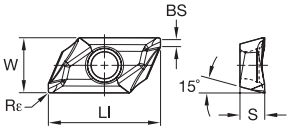


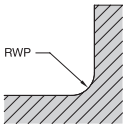


order number	catalogue number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6425291	VHSC040Z03S16XD16	40	16	32	45	16	3	7.6°	35000	Yes	0,20
6425292	VHSC050Z04S22XD16	50	22	45	45	16	4	7.8°	30000	Yes	0,31
6425293	VHSC063Z04S22XD16	63	22	50	45	16	4	5.9°	26000	Yes	0,55

Inserts • XDET-ALP







● first choice
○ alternate choice

P		
M		
K		
N		●
S		
H		

WIDIA VICTORY

ISO catalogue number	cutting edges	LI	S	W	BS	Rε	RWP*	hm	WN10HM
XDET16M5PDFRALP	2	22,92	5,00	11,25	1,42	0,30	0,30	0,02	6425772
XDET16M504FRALP	2	23,02	5,00	11,25	1,27	0,40	0,40	0,02	6425773
XDET16M508FRALP	2	23,02	5,00	11,25	0,87	0,80	0,80	0,02	6425774
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

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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

Recommended Starting Speeds [m/min]

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

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

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.

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FACE MILLS

M1200 MINI

Pages A60–A67

- Insert size 13
- Ap1 max up to 4.7mm





M1200

Pages A68–A75

- Insert size 16
- Ap1 max up to 6mm



M640

Pages A76–A81

- Insert size 11
- Ap1 max up to 4.8mm

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TURBINE BLADE MACHINING WITH M1200 MINI

ENERGY



M1200 MINI HF



12 True Cutting Edges



15° Lead

Insert HN.J0704

Ap1 max = 1.7mm

High Feed Face Mill

M1200 MINI 45°



12 True Cutting Edges



45° Lead

Insert HN.J0704

Ap1 max = 3.5mm

M1200 MINI 60°



12 True Cutting Edges



60° Lead

Insert HN.J0704

Ap1 max = 4.7mm

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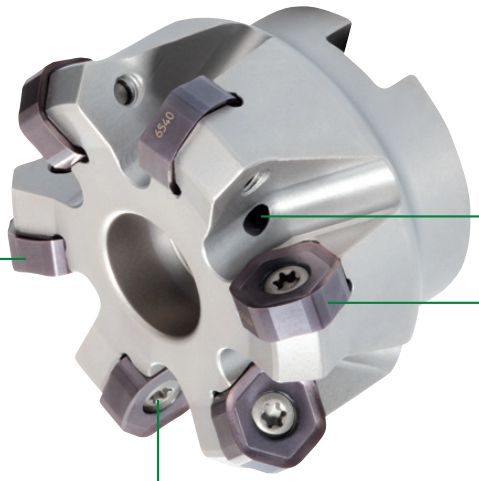
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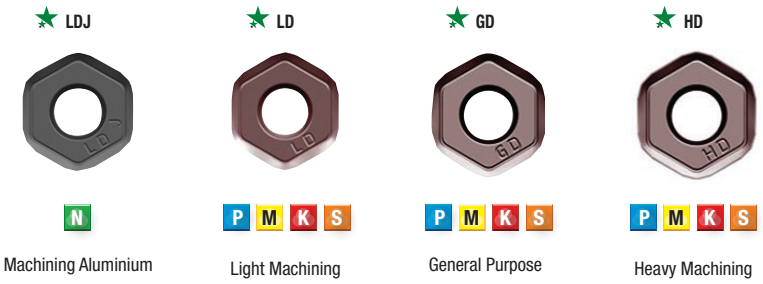
M1200 Mini

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

- First choice for low depth of cut face milling.
- Low cost per edge and high productivity.
- Reduced cutting forces due to soft cutting action.
- Significantly increased Metal Removal Rates (MRR).
- Excellent tool life in light to heavy machining.
- Shorter machining cycle times.



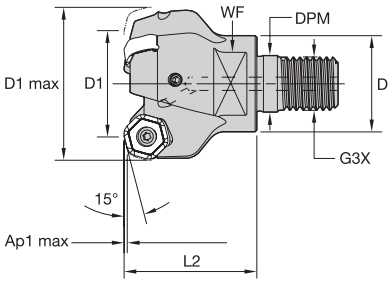
Latest soft cutting edge insert design for all material groups



★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

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

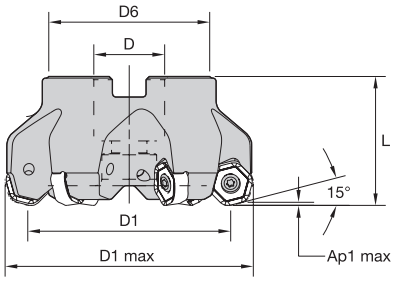




order number	catalogue number	D1	D1 max	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
4136875	M1200HF025Z03M16HN07	25	39	29	17,0	M16	32	22	1,7	3	20000	Yes	0,2

15° • High Feed • Shell Mills • Metric

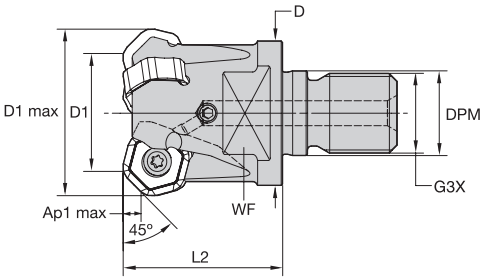




order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136884	M1200HF040Z05HN07	40	54,1	22	38	40	1,7	5	15800	Yes	0,29
4136885	M1200HF050Z05HN07	50	64,1	22	38	40	1,7	5	12700	Yes	0,40
4136886	M1200HF063Z06HN07	63	77,1	22	50	40	1,7	6	10100	Yes	0,67
4136887	M1200HF080Z08HN07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

45° • Screw-On End Mills • Metric

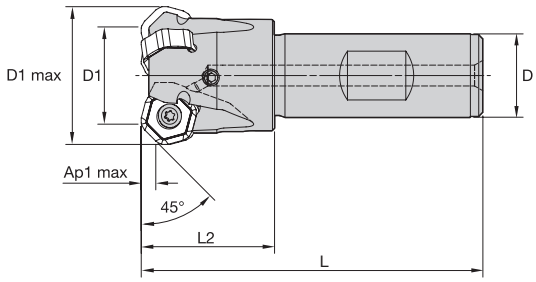


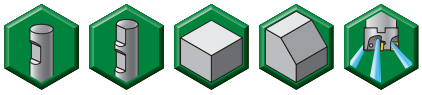


order number	catalogue number	D1	D1 max	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	kg
3957840	M1200D025Z03M16HN07	25	33,7	29	17,0	M16	32	22	3,5	3	20000	Yes	0,13
3957841	M1200D032Z03M16HN07	32	40,7	29	17,0	M16	40	22	3,5	3	17600	Yes	0,20
3957842	M1200D032Z04M16HN07	32	40,7	29	17,0	M16	40	22	3,5	4	17600	Yes	0,20

45° • Weldon® End Mills • Metric

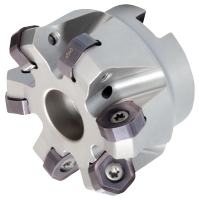


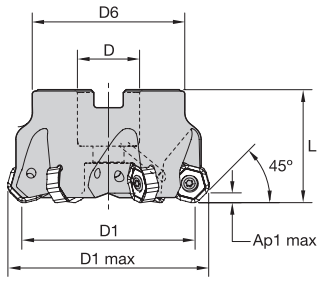


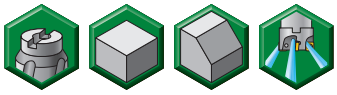


order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3958012	M1200D025Z03B20HN07	25	33,7	20	82	32	3,5	3	20000	Yes	0,21
3958023	M1200D032Z03B25HN07	32	40,7	25	97	40	3,5	3	17600	Yes	0,39
3958024	M1200D032Z04B25HN07	32	40,7	25	97	40	3,5	4	17600	Yes	0,40

45° • Shell Mills • Metric

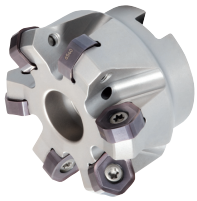


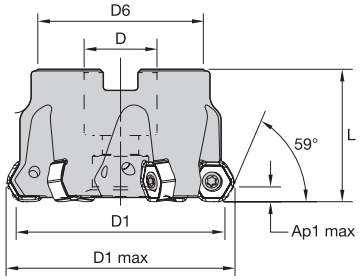




order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3957995	M1200D040Z04HN07	40	48,7	22	38	40	3,5	4	15800	Yes	0,26
3957996	M1200D040Z05HN07	40	48,7	22	38	40	3,5	5	15800	Yes	0,26
3957997	M1200D050Z04HN07	50	58,7	22	38	40	3,5	4	12700	Yes	0,35
3957998	M1200D050Z05HN07	50	58,7	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
4138471	M1200D125Z12HN07	125	133,7	40	90	63	3,5	12	5050	Yes	2,96

60° • Shell Mills • Metric

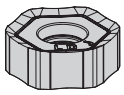


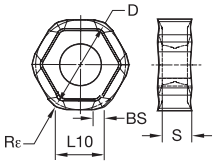


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4136863	M1200HD040Z05HN07	40	46,8	22	38	40	4,7	5	15800	Yes	0,22
4136865	M1200HD050Z05HN07	50	56,8	22	38	40	4,7	5	12700	Yes	0,34
4136867	M1200HD063Z06HN07	63	69,8	22	50	40	4,7	6	10100	Yes	0,60
4136868	M1200HD080Z05HN07	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

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15°/75° • 45°• 30°/60° Inserts • HNGJ-LDJ



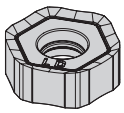


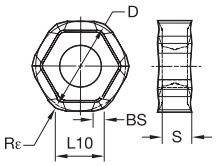
● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

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

15°/75° • 45°• 30°/60° Inserts • HNGJ-LD



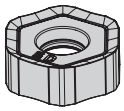


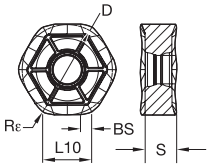
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0704ANENLD	12	13	6,80	4,48	1,60	1,20	0,08	5895291	5895292	5550905	5528975	6180295
HNGJ070432ANENLD	12	13	6,80	4,48	–	3,21	0,08	ı	ı	ı	ı	6180300

15°/75° • 45°• 30°/60° Inserts • HNPJ-GD



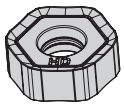


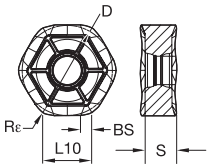
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNPJ0704ANSNGD	12	13	6,80	4,45	1,27	1,20	0,10	5427374	5895293	5895294	5550906	5528976	6180297

15°/75° • 45°• 30°/60° Inserts • HNPJ-HD





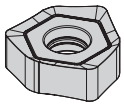
● first choice
○ alternate choice

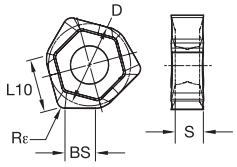
P				●	●	○							
M				●	●	●							
K			●										
N													
S				●	○	●							
H													

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP35CM	WP40PM	WS40PM
HNPJ0704ANSNHD	12	13	6,80	4,41	1,25	1,20	0,14	5427375	5895296	5550907	6180299
HNPJ070432ANSNHD	12	13	6,80	4,42	–	3,20	0,14	-	-	5895297	6180311

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45° • Inserts • XNGJ-LD3 Wiper





● first choice
○ alternate choice

P		○						
M		●						
K								
N								
S		●						
H								

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WS40PM
XNGJ0704ANENLD3W	3	13	6,78	4,47	6,78	1,30	0,08	6180296

Insert Selection Guide

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

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Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			TN7535			WK15CM ★		
P	1	–	–	–	–	–	–	410	**320**	280	360	**280**	240	545	**475**	445	–	–	–
	2	–	–	–	–	–	–	320	**250**	215	250	**190**	170	335	**305**	275	–	–	–
	3	–	–	–	–	–	–	280	**215**	185	215	**170**	140	305	**275**	245	–	–	–
	4	–	–	–	–	–	–	235	**170**	145	180	**130**	110	230	**210**	190	–	–	–
	5	–	–	–	–	–	–	310	**235**	200	240	**180**	150	310	**275**	250	–	–	–
	6	–	–	–	–	–	–	205	**160**	130	160	**120**	100	190	**160**	130	–	–	–
M	1	–	–	–	–	–	–	190	**120**	80	130	**80**	60	245	**220**	185	–	–	–
	2	–	–	–	–	–	–	120	**80**	50	80	**50**	40	220	**190**	170	–	–	–
	3	–	–	–	–	–	–	125	**80**	55	85	**50**	40	175	**155**	140	–	–	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	335	**300**	275
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	50	**35**	30	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	25	**20**	10	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	70	**40**	30	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	60	**30**	25	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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.

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

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

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

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

M1200

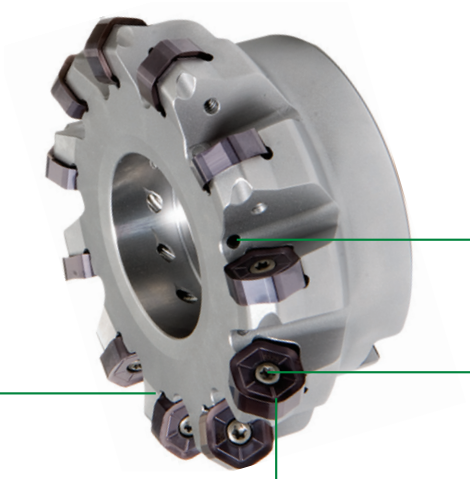
Best-in-class face milling platform to boost productivity on taper 50 spindle milling machines and driven tools.

- Low cost per edge, high productivity solution.
- High feed rates for rough face milling.
- 15°, 45° and 60° lead angles.
- One series meets every face milling need.
- Available in WIDIA™ premium milling grades.
- Better tool life in light to heavy machining.

Materials:

P M K N S H

12 Effective cutting edges



Through tool coolant.

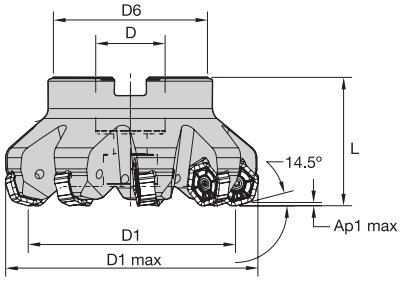
Easy-to-use — one screw enables fast, accurate indexing.

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

The latest technology with 12 true cutting edges and high-precision PSTS inserts.

15° • High Feed • Shell Mills • Metric

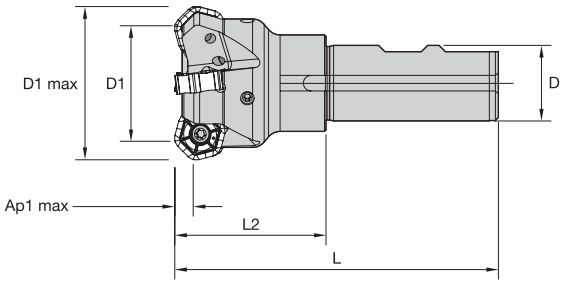




order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3750370	M1200HF050Z04HN09	50	67,9	22	38	40	2,2	4	11400	Yes	0,65
3750372	M1200HF063Z05HN09	63	80,9	22	50	40	2,2	5	8950	Yes	0,65
3750434	M1200HF080Z06HN09	80	97,9	27	60	50	2,2	6	7300	Yes	1,24
3750435	M1200HF100Z08HN09	100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

45° • Weldon® End Mills • Metric



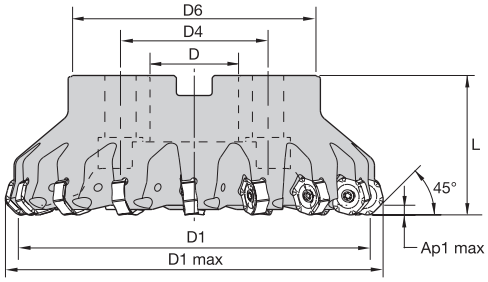


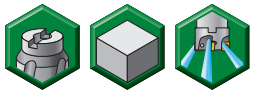
order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
3325311	M1200D040Z04B25HN09	40	51,0	25	107	50	4,5	4	15800	Yes	0,52

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45° • Shell Mills • Metric



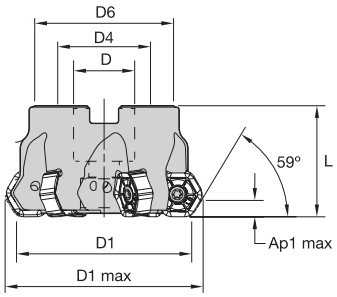


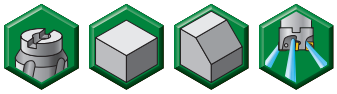


order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
3957970	M1200D040Z03HN09	40	51,0	22	–	39	40	4,4	3	15800	Yes	0,26
3957971	M1200D040Z04HN09	40	51,0	22	–	39	40	4,4	4	15800	Yes	0,25
3325312	M1200D050Z04HN09	50	61,0	22	–	38	40	4,5	4	12700	Yes	0,32
3325693	M1200D050Z05HN09	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
3081508	M1200D125Z10HN09	125	135,9	40	–	90	63	4,5	10	5050	Yes	2,77
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

60° • Shell Mills • Metric



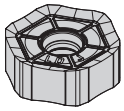


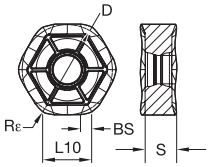


order number	catalogue number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4152116	M1200HD063Z06HN09	63	71,5	22	–	50	40	6,0	6	10100	Yes	0,55
4152117	M1200HD080Z05HN09	80	88,5	27	–	60	50	6,0	5	7900	Yes	1,05
4152118	M1200HD080Z08HN09	80	88,5	27	–	60	50	6,0	8	7900	Yes	1,10
4152119	M1200HD100Z06HN09	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
4152123	M1200HD160Z09HN09	160	168,5	40	66,7	110	63	6,0	9	3900	Yes	4,62

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15°/75° • 45°• 30°/60° Inserts • HNGJ-LDJ



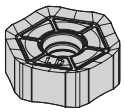


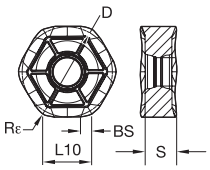
● first choice
○ alternate choice

P	M	K	N	S	H
			●		

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

15°/75° • 45°• 30°/60° Inserts • HNGJ-LD



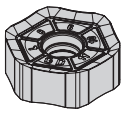


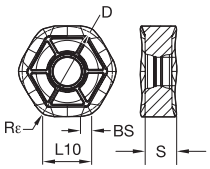
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0905ANENLD	12	16	8,58	5,56	1,80	1,20	0,05	5895346	5895347	5895348	5528973	6180276

15°/75° • 45°• 30°/60° Inserts • HNPJ-GD



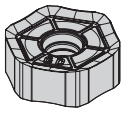


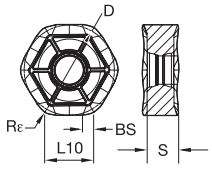
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP25PM	WP35CM	WP40PM	WS40PM
HNPJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	5427372	5895374	5895375	5550908	6180278

15°/75° • 45°• 30°/60° Inserts • HNGJ-GD



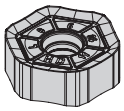


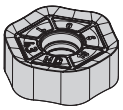
● first choice
○ alternate choice

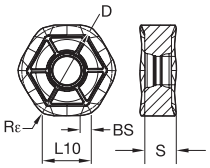
P			●	●	●		○						
M			●	●	●	○	●						
K		●	○										
N													
S			●	●	○	●	●						
H			○										

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP25PM	WP35CM	WP40PM	WS30PM	WS40PM
HNGJ0905ANSNGD	12	16	8,58	5,56	1,80	1,20	0,10	5427370	5400965	5895349	5895350	5528974	6180280

15°/75° • 45°• 30°/60° Inserts • HNPJ-HD





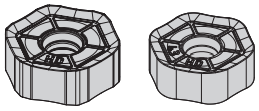


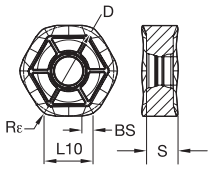
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM	WP25PM	WP35CM	WP40PM	WS40PM
HNPJ090543ANSNHD	12	16	8,50	5,44	–	4,34	0,13	-	5895378	5895379	5895380	6180294
HNPJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,18	5427371	5895376	5895377	5550909	6180279

15°/75° • 45°• 30°/60° Inserts • HNGJ-HD



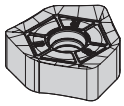


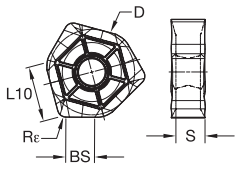
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WP25PM	WP35CM	WP40PM	WS40PM
HNGJ090543ANSNHD	12	16	8,50	5,44	–	4,35	0,20	-	-	-	6180292
HNGJ0905ANSNHD	12	16	8,59	5,46	1,66	1,20	0,17	5895371	5895372	5895373	6180291

45° • Inserts • XNGJ-GD3 Wiper





● first choice
○ alternate choice

P	
M	
K	●
N	
S	
H	

ISO catalogue number	cutting edges	D	L10	S	BS	Rε	hm	WK15CM
XNGJ0905ANSNGD3W	3	16	9,60	5,51	6,00	1,60	0,09	5622622

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Insert Selection Guide

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

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			TN7535			WK15CM			WP25PM		
P	1	–	**–**	–	410	**320**	280	360	**280**	240	545	**475**	445	–	**–**	–	395	**340**	325
	2	–	**–**	–	320	**250**	215	250	**190**	170	335	**305**	275	–	**–**	–	330	**290**	240
	3	–	**–**	–	280	**215**	185	215	**170**	140	305	**275**	245	–	**–**	–	305	**260**	210
	4	–	**–**	–	235	**170**	145	180	**130**	110	230	**210**	190	–	**–**	–	270	**220**	180
	5	–	**–**	–	310	**235**	200	240	**180**	150	310	**275**	250	–	**–**	–	220	**205**	180
	6	–	**–**	–	205	**160**	130	160	**120**	100	190	**160**	130	–	**–**	–	200	**150**	120
M	1	–	**–**	–	190	**120**	80	130	**80**	60	245	**220**	185	–	**–**	–	245	**215**	200
	2	–	**–**	–	120	**80**	50	80	**50**	40	220	**190**	170	–	**–**	–	220	**190**	155
	3	–	**–**	–	125	**80**	55	85	**50**	40	175	**155**	140	–	**–**	–	170	**145**	115
K	1	450	**320**	230	275	**245**	220	220	**205**	180	355	**320**	290	505	**460**	410	275	**245**	220
	2	390	**250**	190	215	**190**	180	175	**155**	140	280	**250**	230	400	**355**	330	215	**190**	180
	3	300	**230**	160	180	**160**	145	155	**145**	125	235	**210**	190	335	**300**	275	180	**160**	145
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	50	**40**	30
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	50	**40**	30
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	60	**50**	30
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	85	**60**	40
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	145	**110**	85
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		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.

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

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

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

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M640

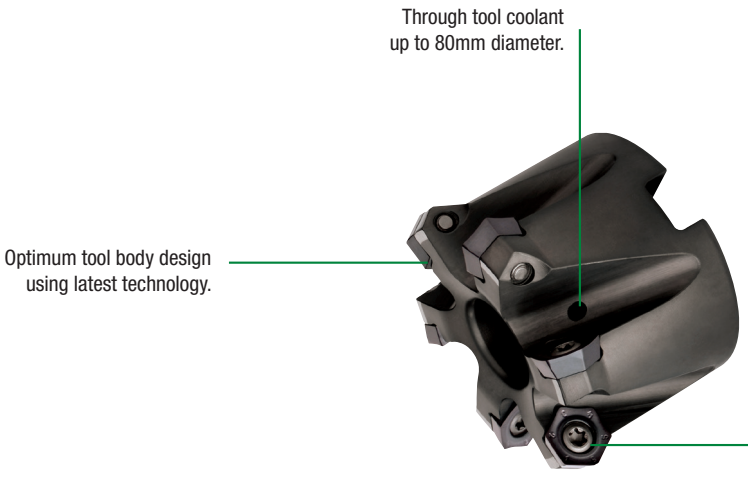
The M640 platform is the first choice when high productivity, superior finish operations, and soft cutting performance are a priority. With six effective cutting edges and a streamlined body design; this easy-to-use tool is ideal, even for low-power machines.

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

Materials:

P M K N S





Low cutting force wiper insert: special wiper design for very soft cutting in finishing operations.

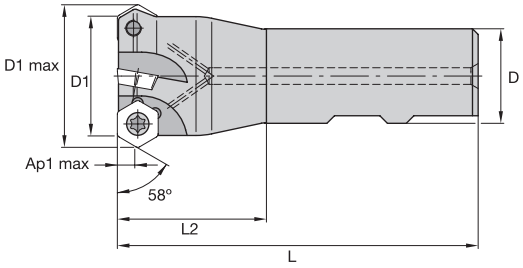
6 cutting edges,
high positive rake

- Extremely low cutting forces.
- For low-power machines, driven unity, and light fixtures.
- Through tool coolant.

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Weldon® End Mills • Metric

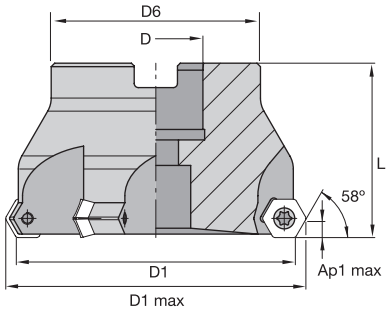




order number	catalogue number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	kg
2263165	**12395405200**	32	38,4	32	100	40	4,8	4	29500	Yes	0,35

Shell Mills • Metric

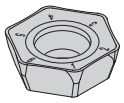


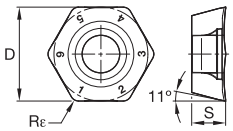


order number	catalogue number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
2263132	**12395410200**	50	56,4	22	47	40	4,8	4	19000	Yes	0,40
2263154	**12395410400**	63	69,4	22	50	40	4,8	5	15000	Yes	0,55
2263156	**12395410600**	80	86,4	27	60	50	4,8	6	11500	Yes	1,05
2263158	**12395410800**	100	106,4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

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Inserts • HPGT-LDAL



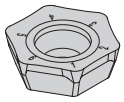


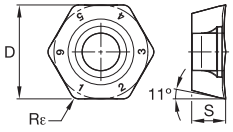
● first choice
○ alternate choice

P	M	K	N	S	H
		○	●	○	

ISO catalogue number	cutting edges	D	S	Rε	hm	THM
HPGT06T3DZFRLDAL	6	11	4,00	0,90	0,08	2288106

Inserts • HPGT-LD



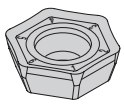


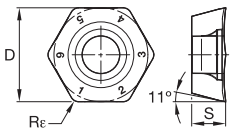
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	hm	WP25PM	WP40PM	WS40PM
HPGT06T3DZERLD	6	11	3,99	0,98	0,08	5895784	5895785	6180312

Inserts • HPPT-GD



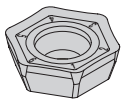


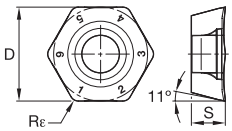
● first choice
○ alternate choice

P	M	K	N	S	H
○	●			●	

ISO catalogue number	cutting edges	D	S	Rε	hm	WS40PM
HPPT06T3DZENGD	6	11	3,97	0,98	0,10	6180315

Inserts • HPGT-GD



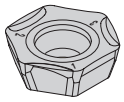


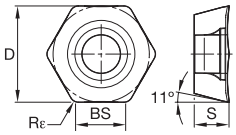
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	hm	TN7535	WK15CM	WP25PM	WP40PM	WS30PM	WS40PM
HPGT06T3DZENGD	6	11	3,97	0,98	0,10	2288066	5427387	5895782	5895783	5528978	6180313

Inserts • HPGT-GD Wiper





● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	BS	Rε	hm	WK15CM	WP25PM	WP40PM	WS40PM
HPGT06T3DZERGD3W	3	11	4,00	2,88	0,98	0,10	5427388	5895786	5895787	6180316

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Insert Selection Guide

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

Recommended Starting Speeds [m/min]

Material Group		TN6510			TN6520			TN6525			TN6540			TN7525			TN7535 ★			WK15CM ★		
P	1	–	**–**	–	–	**–**	–	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445	–	**–**	–
	2	–	**–**	–	–	**–**	–	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275	–	**–**	–
	3	–	**–**	–	–	**–**	–	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245	–	**–**	–
	4	–	**–**	–	–	**–**	–	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190	–	**–**	–
	5	–	**–**	–	–	**–**	–	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250	–	**–**	–
	6	–	**–**	–	–	**–**	–	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130	–	**–**	–
M	1	–	**–**	–	–	**–**	–	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185	–	**–**	–
	2	–	**–**	–	–	**–**	–	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170	–	**–**	–
	3	–	**–**	–	–	**–**	–	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140	–	**–**	–
K	1	480	**350**	260	450	**320**	230	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290	505	**460**	410
	2	420	**280**	205	390	**250**	190	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230	400	**355**	330
	3	335	**260**	200	300	**230**	160	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190	335	**300**	275
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	–	**–**	–
H	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

Material Group		WP25PM ★			WP35CM			WP40PM ★			WS30PM ★			WS40PM ★			TN6501			THM-U			THM ★		
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	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	230	**205**	180	145	**110**	90
	2	215	**190**	180	280	**250**	230	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	150	**120**	85
	3	180	**160**	145	235	**210**	190	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	155	**115**	70
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	2400	**1440**	1200	2400	**1440**	1200	1080	**720**	600
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	1640	**980**	800	1640	**980**	800	820	**560**	460
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	960	**600**	480	960	**600**	480	540	**335**	240
S	1	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	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

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

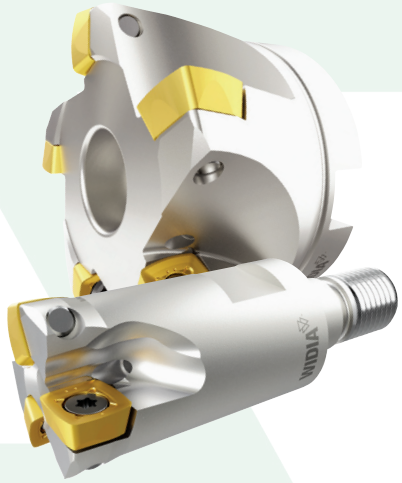
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HIGH-FEED MILLS

VXF™-07/12

Pages A84–A90

4-Edged, Victory™ X-Feed™ Mill
Next level of High-Feed Milling





M370™

Pages A92–A96

Double-sided high-feed rougher
with 6 edges per insert.

COPY MILLS



M200™

Pages A98–A105

Revolutionary double-sided round insert platform with effective anti-rotation feature and 12 cutting edges per insert.

M100™

Pages A106–A119

Proven multipurpose solution for profiling and copy milling applications.



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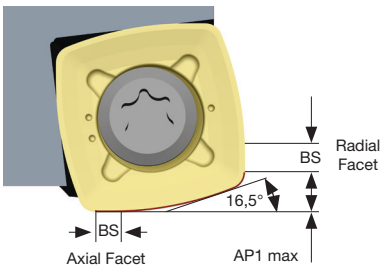
VXF™

VXF mills are a high-feed productivity booster designed to establish new industry standards with market-leading milling grades.

- 16.5° lead angle redistributes cutting forces in the spindle z-axis direction.
- PSTS inserts for powerful low cost per edge high-feed milling.
- Cutters with internal coolant supply.
- 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.

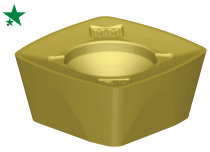


Perfect combination of round and square insert style.



Specifically engineered chipbreakers for powerful high-feed milling.

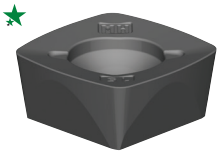
-MM



P M S

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

-MH



P

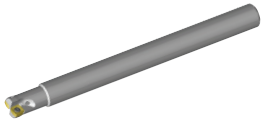
First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs.

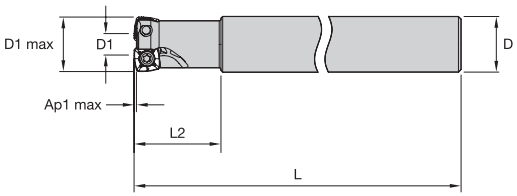
Lower Cutting Forces

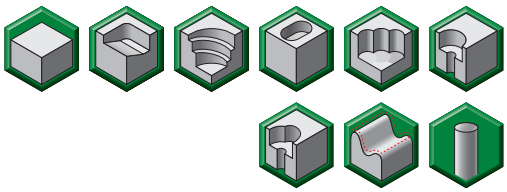
Geometry Strengthening/Stronger Cutting Edge Protection

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Cylindrical End Mills • Metric





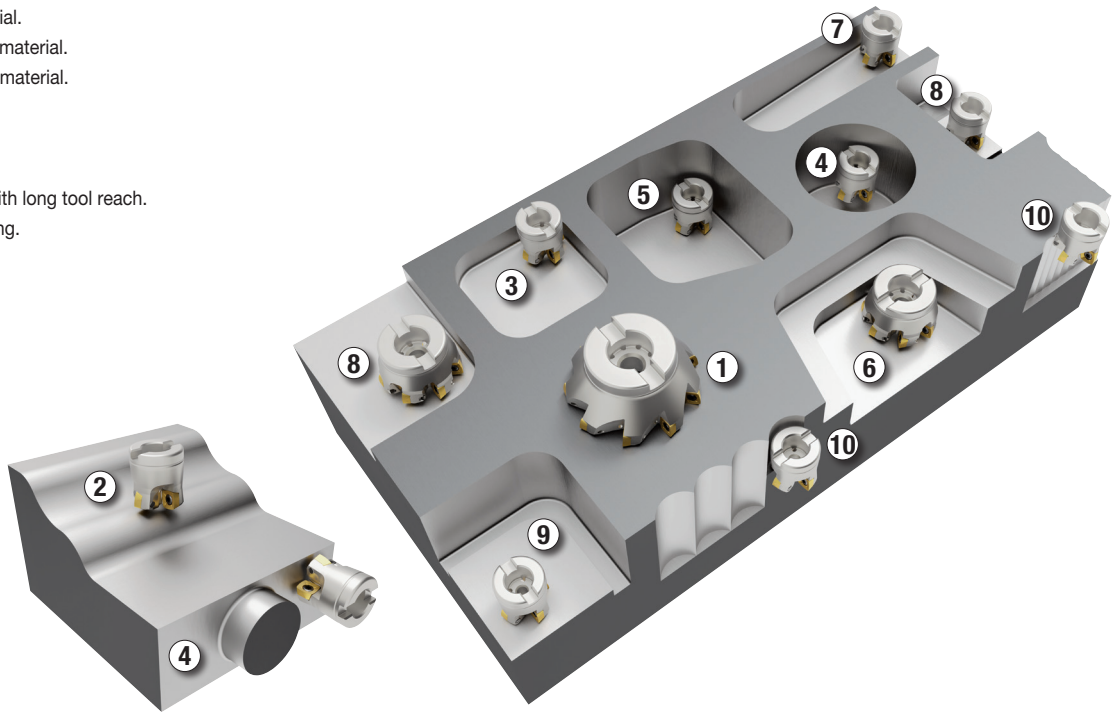


order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6597154	VXF016Z02A16XP07L180	16	7	16	180	25	0,9	2	5.9°	65000	Yes	0,24
6597156	VXF020Z03A20XP07L190	20	11	20	190	32	0,9	3	3.4°	57000	Yes	0,41
6597157	VXF025Z04A25XP07L200	25	16	25	200	40	0,9	4	2.2°	49000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

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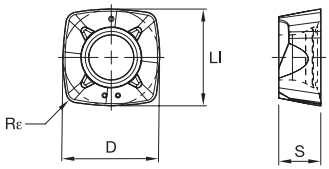
Applications

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.



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



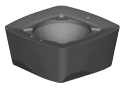


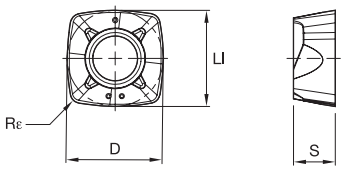
● first choice
○ alternate choice

P	M	K	N	S	H
●	●	○		●	
○	●			●	

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

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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 0,70 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

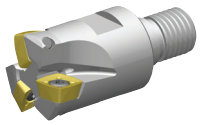
At 0,90 Axial Depth of Cut (AP1)

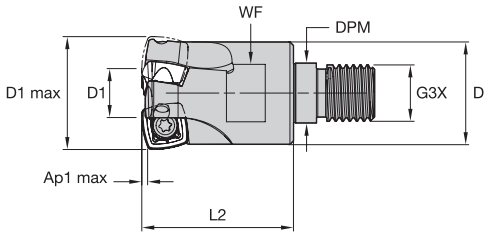
Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.E..MM	0,37	**1,06**	1,89	0,27	**0,73**	1,24	0,20	**0,53**	0,89	0,17	**0,46**	0,77	0,16	**0,42**	0,70	.E..MM
.S..MH	0,68	**1,46**	2,35	0,48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

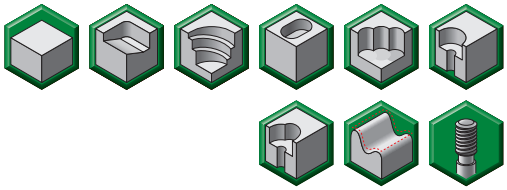
NOTE: Use "Light Machining" values as starting feed rate.

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Screw-On End Mills • Metric

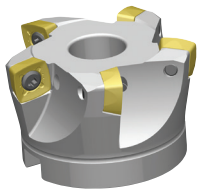


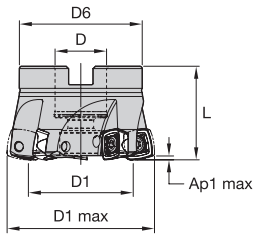


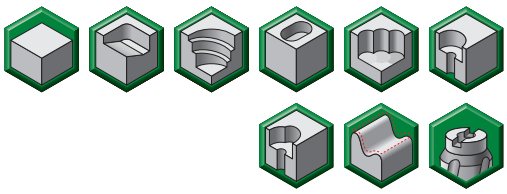


order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596723	VXF032Z03M16XD12	32	14	29	17,0	M16	43	24	2,5	3	1.8°	31500	Yes	0,19

Shell Mills • Metric

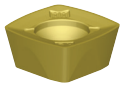


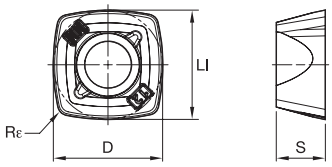




order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
6596725	VXF040Z04S22XD12	40	22	22	38	40	2,5	4	1.4°	26500	Yes	0,19
6596728	VXF050Z04S22XD12	50	32	22	48	40	2,5	4	.9°	22500	Yes	0,31
6596729	VXF052Z05S22XD12	52	34	22	48	40	2,5	5	.8°	22000	Yes	0,32
6596730	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

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



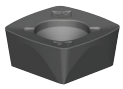


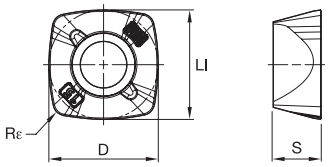
● first choice
○ alternate choice

P	M	K	N	S	H
●	●			●	
○	●			●	

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

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Insert Selection Guide

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

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.

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Designed to Make Your Workplace More Productive

WIDIA™ X-Feed™

WIDIA-branded X-Feed tooling was created as an application-specific portfolio to remove as much material as possible in the shortest amount of time, using a shallow depth of cut to achieve higher MRR and boost productivity.

X-FEED → HIGH-FEED MILLING → BOOST PRODUCTIVITY



Victory™ X-Feed For Machining Stainless Steel and Titanium

AEROSPACE

70NS Series

Designed for circular plunging and ramping, 3D machining, face milling, and pocketing applications.



Victory X-Feed To Speed Up High-Feed Machining

VXF™-7 and VXF™-12 Series

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

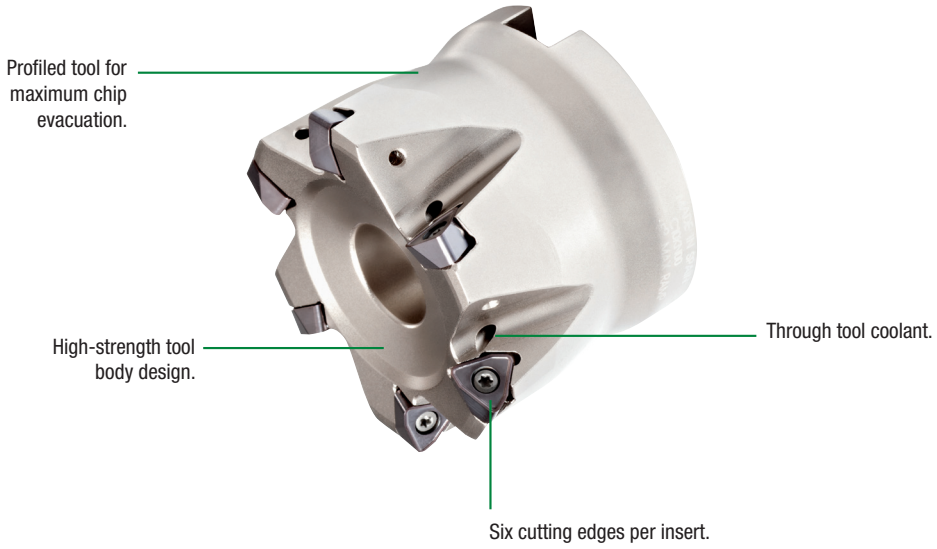
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WIDIA™

M370™

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

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



★ 8mm iC Insert WOEJ0804

Up to 1.3mm Ap max
Diameter range 25–80mm

-MM



P M S

Provides lower cutting forces, first choice for steel, stainless steel, and high-temp alloys.

-MH



P M K S

First choice for high-strength steel and cast iron.

★ 12mm iC Insert WOEJ1207

Up to 2.0mm Ap max
Diameter range 42–125mm

-MM



P M K S

Provides lower cutting forces, first choice for steel, stainless steel, and high-temp alloys.

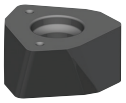
-MH



P M K S

First choice for high-strength steel and cast iron.

-MR



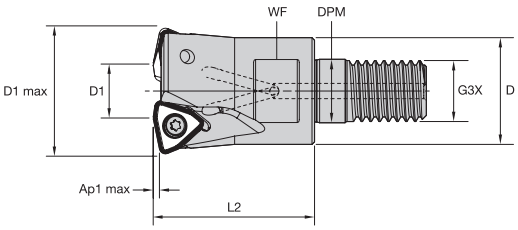
P M S

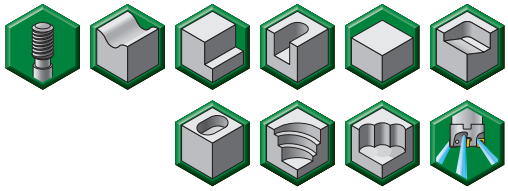
Strongest edge protection for heavy roughing jobs with ugly skin or forged steel components.

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Screw-On End Mills • Medium • Metric



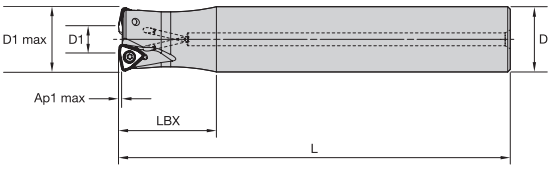


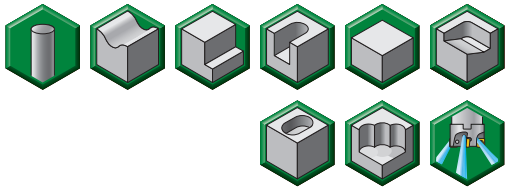


order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4056186	M370D025Z02M12WO08	25	11	21	12,5	M12	35	17	1,3	2	2.1°	46000	Yes	0,09
4170918	M370D025Z03M12WO08	25	11	21	12,5	M12	35	17	1,3	3	2.1°	46000	Yes	0,09
4056187	M370D032Z04M16WO08	32	18	29	17,0	M16	43	24	1,3	4	1.4°	38700	Yes	0,21
4056188	M370D042Z05M16WO08	42	28	29	17,0	M16	43	24	1,3	5	1.0°	32500	Yes	0,57

Cylindrical End Mills • Medium • Metric





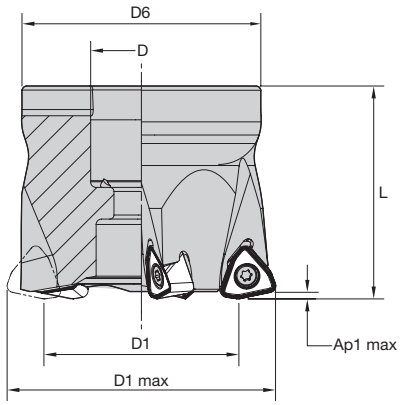


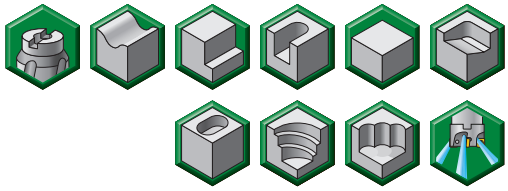
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4056189	M370D025Z03A25WO08L150	25	11	25	150	40	1,3	3	46000	Yes	0,50
4170919	M370D025Z03A25WO08L200	25	11	25	200	40	1,3	3	46000	Yes	0,69
4056192	M370D032Z04A32WO08L200	32	18	32	200	50	1,3	4	38700	Yes	1,14
4056191	M370D032Z04A32WO08L150	32	18	32	150	40	1,3	4	38700	Yes	0,84

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Shell Mills • Medium • Metric

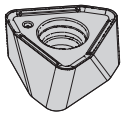


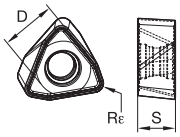




order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	kg
4056193	M370D040Z04WO08	40	26	16	37	40	1,3	4	33500	Yes	0,19
4170922	M370D040Z05WO08	40	26	16	37	40	1,3	5	33500	Yes	0,19
4008276	M370D050Z05WO08	50	36	22	44	40	1,3	5	29200	Yes	0,29
4171223	M370D050Z06WO08	50	36	22	44	40	1,3	6	29200	Yes	0,29
4056194	M370D052Z05WO08	52	38	22	44	50	1,3	5	28600	Yes	0,41
4171224	M370D052Z06WO08	52	38	22	44	50	1,3	6	28600	Yes	0,40
4056195	M370D063Z06WO08	63	49	22	60	50	1,3	6	25500	Yes	0,74
4008277	M370D066Z06WO08	66	52	27	60	50	1,3	6	24900	Yes	0,77
4171225	M370D080Z07WO08	80	66	27	60	50	1,3	7	24900	Yes	2,36

Inserts • Medium • WOEJ-MM



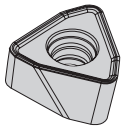


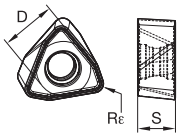
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	WP25PM	WS30PM	WS40PM	WP40PM
WOEJ080412SRMM	6	7,79	4,70	1,22	5564597	5520248	6333665	5544753

Inserts • Medium • WOEJ-MH





● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	Rε	TN7535	WK15CM	WP25PM	WP40PM	WS40PM
WOEJ080412SRMH	6	7,79	4,75	1,22	4068517	5427443	5564596	5544752	6333664

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Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	...MM	WP40PM	**...MM**	**WP40PM**	...MM	WP40PM
P3–P4	...MM	WP25PM	**...MM**	**WP40PM**	...MH	WP40PM
P5–P6	...MM	WP25PM	**...MH**	**WP25PM**	...MH	WP40PM
M1–M2	...MM	WP25PM	**...MM**	**WS30PM**	...MM	WP40PM
M3	...MM	WP25PM	**...MM**	**WP25PM**	...MM	WP40PM
K1–K2	...MH	WK15CM	**...MH**	**WK15CM**	...MH	WK15CM
K3	...MH	TN6520	**...MH**	**TN6520**	...MH	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	...MM	WP25PM	**...MM**	**WS30PM**	...MM	WP40PM
S3	...MM	WS30PM	**...MM**	**WS30PM**	...MM	WP40PM
S4	...MM	WS30PM	**...MM**	**WP40PM**	...MM	WP40PM
H1	...MH	WP25PM	**–**	**–**	–	–

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN7535 ★			WK15CM ★			WP25PM ★			WS30PM			WP40PM ★			WS40PM ★		
P	1	–	–	–	410	**320**	280	545	**475**	445	–	–	–	395	**340**	325	–	–	–	355	**310**	295	–	–	–
	2	–	–	–	320	**250**	215	335	**305**	275	–	–	–	330	**290**	240	–	–	–	300	**260**	215	–	–	–
	3	–	–	–	280	**215**	185	305	**275**	245	–	–	–	305	**260**	210	–	–	–	275	**235**	190	–	–	–
	4	–	–	–	235	**170**	145	230	**210**	190	–	–	–	270	**220**	180	–	–	–	245	**205**	160	–	–	–
	5	–	–	–	310	**235**	200	310	**275**	250	–	–	–	220	**205**	180	–	–	–	205	**185**	160	440	**325**	230
	6	–	–	–	205	**160**	130	190	**160**	130	–	–	–	200	**150**	120	–	–	–	180	**140**	110	375	**260**	165
M	1	–	–	–	190	**120**	80	245	**220**	185	–	–	–	245	**215**	200	270	**240**	220	235	**205**	185	850	**605**	375
	2	–	–	–	120	**80**	50	220	**190**	170	–	–	–	220	**190**	155	245	**215**	175	210	**180**	150	755	**560**	345
	3	–	–	–	125	**80**	55	175	**155**	140	–	–	–	170	**145**	115	185	**160**	125	155	**140**	110	625	**440**	280
K	1	450	**320**	230	275	**245**	220	355	**320**	290	505	**460**	410	275	**245**	220	–	–	–	–	–	–	–	–	–
	2	390	**250**	190	215	**190**	180	280	**250**	230	400	**355**	330	215	**190**	180	–	–	–	–	–	–	–	–	–
	3	300	**230**	160	180	**160**	145	235	**210**	190	335	**300**	275	180	**160**	145	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**50**	35	50	**40**	35	200	**145**	90
	2	–	–	–	–	–	–	–	–	–	–	–	–	50	**40**	30	55	**50**	35	50	**40**	35	180	**130**	85
	3	–	–	–	–	–	–	–	–	–	–	–	–	60	**50**	30	65	**55**	35	60	**50**	35	210	**150**	95
	4	–	–	–	–	–	–	–	–	–	–	–	–	85	**60**	40	100	**70**	50	80	**60**	40	295	**215**	135
H	1	–	–	–	–	–	–	–	–	–	–	–	–	145	**110**	85	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

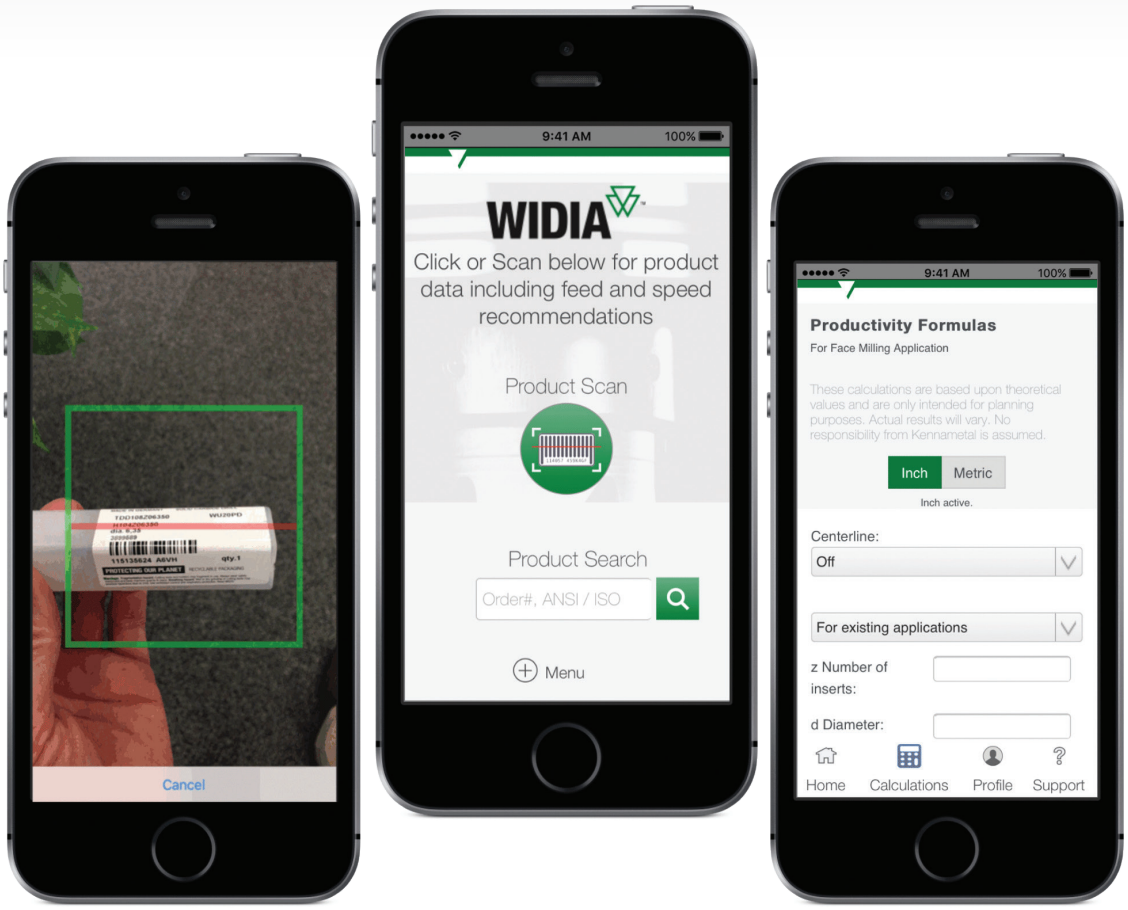
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
..MM	0,90	**1,67**	4,09	0,65	**1,19**	2,83	0,48	**0,88**	2,08	0,42	**0,77**	1,80	0,38	**0,70**	1,64	..MM
..MH	0,90	**2,34**	5,00	0,65	**1,66**	3,41	0,48	**1,23**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

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

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Machining Central App from WIDIA™

The fastest, easiest way to get feeds and speeds.



SCAN

With the new WIDIA app, product data is just a quick scan away. Now, when you're on the floor and need to quickly access the speeds and feeds of your favorite WIDIA tool, the WIDIA app gives you reliable information in just a few seconds.

SEARCH

Don't have a barcode? The new WIDIA app includes another simple search technique — just type the tool's corresponding order number or the ANSI or ISO catalogue number into the search bar. You'll get the same reliable data as if you'd scanned the tool's barcode. It's simple and quick — no interruption in production!

CALCULATE

Have a specific machining need that our recommended speeds and feeds don't quite address? Try out our three NOVO™ based calculators. Both end milling and face milling calculators are available. Simply fill in the blank fields, and our calculators will quickly provide the data you need.

DOWNLOAD THE **WIDIA MACHINING CENTRAL** MOBILE APP

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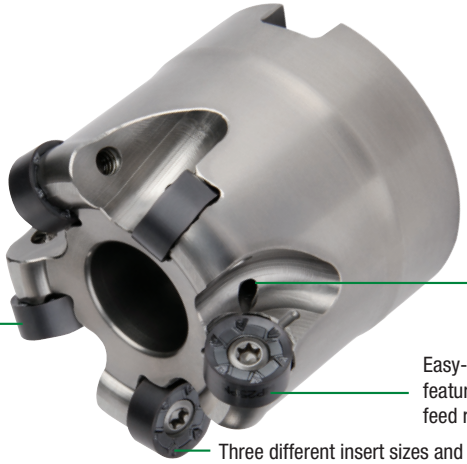
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WIDIA™

M200™

- Up to 12 cutting edges per insert.
- First choice for roughing applications.
- Effective anti-rotation feature.
- Able to apply in all type of materials and milling applications.



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

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

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

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

★ M200 iC 10

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 iC 12

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



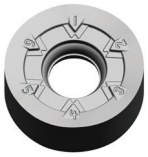
P K

First choice for heavy machining and cast iron.

M200 iC 16

16mm iC insert
12 cutting edges

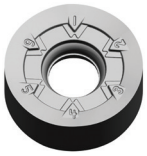
-ALP



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



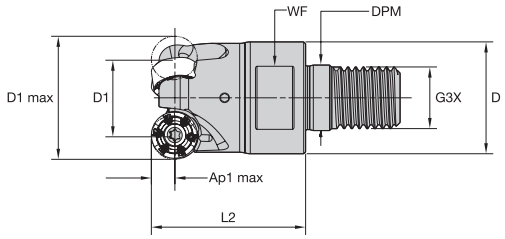
P K

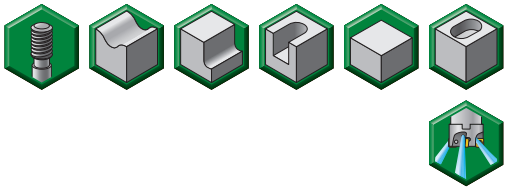
First choice for heavy machining and cast iron.

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Screw-On End Mills • Metric



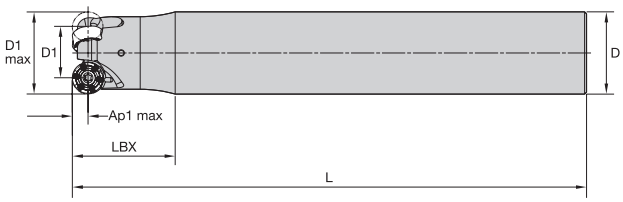


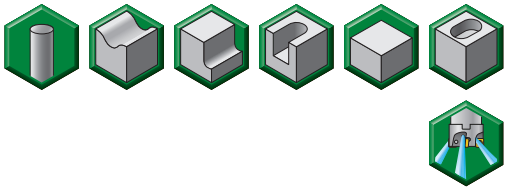


order number	catalogue number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147560	M200D32Z03M16RN12	32	20	29	17,0	M16	40	24	3,0	3	.5°	39160	Yes	0,18
4147561	M200D35Z03M16RN12	35	23	29	17,0	M16	40	24	3,0	3	.4°	37440	Yes	0,19

Cylindrical End Mills • Metric





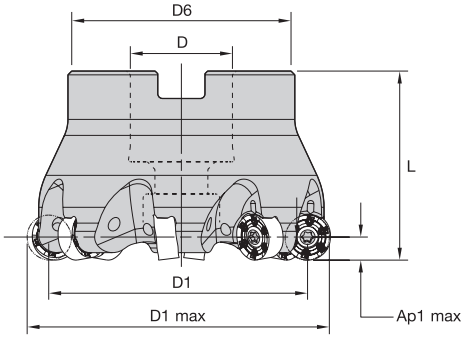


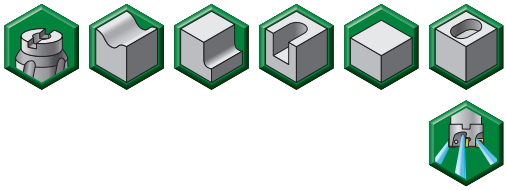
order number	catalogue number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	kg
4147566	M200D32Z03A32RN12L200	32	20	32	200	40	3,0	3	39160	Yes	1,10

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Shell Mills • Metric

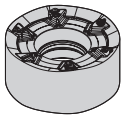


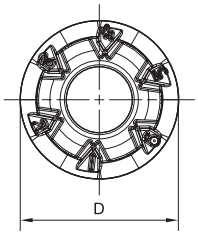




order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
4147568	M200D40Z04RN12	40	28	16	38	40	3,0	4	.4°	35020	Yes	0,22
4147569	M200D50Z04RN12	50	38	22	42	40	3,0	4	.5°	31330	Yes	0,29
4147570	M200D50Z05RN12	50	38	22	42	40	3,0	5	.3°	31330	Yes	0,29
4147571	M200D52Z05RN12	52	40	22	49	50	3,0	5	.5°	30720	Yes	0,50
4147572	M200D63Z05RN12	63	51	22	49	50	3,0	5	.5°	27910	Yes	0,63
4147573	M200D63Z07RN12	63	51	22	49	50	3,0	7	.3°	27910	Yes	0,63
4147574	M200D66Z07RN12	66	54	27	60	50	3,0	7	.3°	27260	Yes	0,82
4147575	M200D80Z06RN12	80	68	27	60	50	3,0	6	.5°	24760	Yes	1,02
4147576	M200D80Z08RN12	80	68	27	60	50	3,0	8	.2°	24760	Yes	1,02
4147577	M200D100Z07RN12	100	88	32	78	50	3,0	7	.2°	22150	Yes	1,45
4147578	M200D100Z09RN12	100	88	32	78	50	3,0	9	.2°	22150	Yes	1,41

Inserts • RNGJ-ML



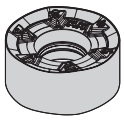


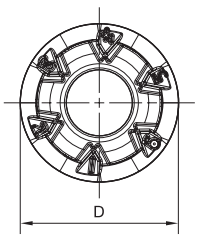
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	WP25PM	WS30PM	WS40PM	WU35PM
RNGJ1204M0EML	2	12,00	4,75	0,04	5123863	5520350	6408153	5123864

Inserts • RNGJ-MM





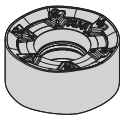
● first choice
○ alternate choice

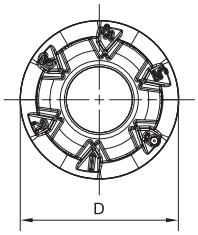
P		●	●		●			
M		●	○	○	●			
K		○	○					
N								
S		●			●			
H		○						

ISO catalogue number	cutting edges	D	S	hm	WP25PM	WP35CM	WS30PM	WU35PM
RNGJ1204M0SMM	2	12,00	4,75	0,09	5123867	5123869	5520351	5123868

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Inserts • RNGJ-MH



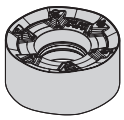


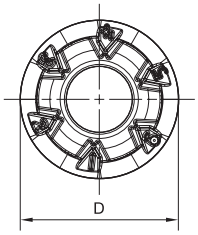
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	WK15PM	WP25PM	WP35CM	WS40PM	WU35PM
RNGJ1204M0SMH	2	12,00	4,75	0,19	5123900	5123901	5123903	6408154	5123902

Inserts • RNPJ-MM



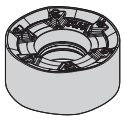


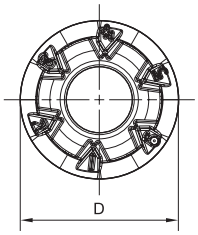
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
RNPJ1204M0SMM	2	12,00	4,75	0,09	5276361	5276360	5542329	6344113	5476634

Inserts • RNPJ-MH



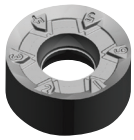


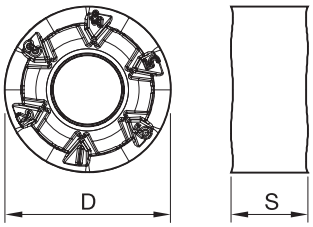
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	WK15CM	WP25PM	WP35CM	WP40PM	WU35PM
RNPJ1204M0SMH	2	12,00	4,75	0,18	5276366	5276364	5276363	5542340	5476635

Inserts • RNGJ-ALP





● first choice
○ alternate choice

P										
M										
K										
N										●
S										
H										

ISO catalogue number	cutting edges	D	S	hm	WN25PM
RNGJ1204M0FALP	2	12,00	4,75	0,02	6065661

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Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	ML	WP25PM	**MM**	**WP40PM**	MM	WP40PM
P3–P4	ML	WP25PM	**MM**	**WP25PM**	MH	WP40PM
P5–P6	ML	WP35CM	**MM**	**WP35CM**	MH	WP35CM
M1–M2	ML	WP25PM	**ML**	**WU35PM**	MM	WU35PM
M3	ML	WP25PM	**MM**	**WU35PM**	MM	WU35PM
K1–K2	MH	WK15CM	**MH**	**WK15CM**	MH	WP20CM
K3	MH	WK15PM	**MH**	**WK15PM**	MH	WP25PM
N1–N2	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
N3	ALP	WN25PM	**ALP**	**WN25PM**	ALP	WN25PM
S1–S2	ML	WS30PM	**MM**	**WS30PM**	MM	WU35PM
S3	ML	WS30PM	**MM**	**WU35PM**	MM	WU35PM
S4	ML	WS30PM	**MM**	**WU35PM**	MM	WU35PM
H1	MH	WP25PM	**MH**	**WP20CM**	–	–

Recommended Starting Speeds [m/min]

Material Group		WK15CM			WK15PM			WN25PM			WP20CM			WP25PM		
P	1	–	–	–	–	–	–	–	–	–	660	**580**	540	395	**340**	325
	2	–	–	–	–	–	–	–	–	–	410	**370**	330	330	**290**	240
	3	–	–	–	–	–	–	–	–	–	370	**330**	305	305	**260**	210
	4	–	–	–	–	–	–	–	–	–	275	**260**	230	270	**220**	180
	5	–	–	–	–	–	–	–	–	–	330	**300**	275	220	**205**	180
	6	–	–	–	–	–	–	–	–	–	230	**205**	175	200	**150**	120
M	1	–	–	–	–	–	–	–	–	–	270	**240**	210	245	**215**	200
	2	–	–	–	–	–	–	–	–	–	245	**210**	190	220	**190**	155
	3	–	–	–	–	–	–	–	–	–	190	**175**	150	170	**145**	115
K	1	505	**460**	**410**	325	**295**	**260**	–	–	–	430	**390**	355	275	**245**	220
	2	400	**355**	**330**	250	**230**	**210**	–	–	–	340	**305**	280	215	**190**	180
	3	335	**300**	**275**	210	**190**	**175**	–	–	–	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	–	–	–	310	**275**	260
	2	335	**305**	275	300	**260**	215	365	**325**	265	–	–	–	265	**230**	190
	3	305	**275**	245	275	**235**	190	340	**290**	235	–	–	–	240	**205**	170
	4	230	**210**	190	245	**205**	160	300	**245**	200	–	–	–	215	**180**	145
	5	310	**275**	250	205	**185**	160	245	**230**	200	165	**120**	85	180	**160**	145
	6	190	**160**	130	180	**140**	110	220	**170**	130	140	**100**	60	155	**120**	95
M	1	245	**220**	185	235	**205**	185	270	**240**	220	315	**225**	140	205	**180**	160
	2	220	**190**	170	210	**180**	150	245	**215**	175	280	**205**	130	185	**155**	130
	3	175	**155**	140	155	**140**	110	185	**160**	125	230	**165**	105	140	**120**	95
K	1	355	**320**	290	–	–	–	–	–	–	–	–	–	–	–	–
	2	280	**250**	230	–	–	–	–	–	–	–	–	–	–	–	–
	3	235	**210**	190	–	–	–	–	–	–	–	–	–	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	50	**40**	35	55	**50**	35	75	**55**	35	40	**35**	30
	2	–	–	–	50	**40**	35	55	**50**	35	70	**50**	35	40	**35**	30
	3	–	–	–	60	**50**	35	65	**55**	35	80	**55**	35	55	**40**	30
	4	80	**60**	40	80	**60**	40	100	**70**	50	110	**80**	50	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.

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 6,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,12	**0,18**	0,32	0,09	**0,13**	0,23	0,07	**0,10**	0,18	0,06	**0,08**	0,15	0,05	**0,08**	0,14	ML
MM	0,28	**0,51**	0,84	0,21	**0,37**	0,61	0,15	**0,28**	0,45	0,13	**0,24**	0,39	0,12	**0,22**	0,36	MM
MH	0,46	**0,70**	1,02	0,33	**0,50**	0,73	0,25	**0,38**	0,55	0,22	**0,33**	0,48	0,20	**0,30**	0,44	MH

At 3,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,14	**0,20**	0,37	0,10	**0,15**	0,27	0,08	**0,11**	0,20	0,07	**0,10**	0,18	0,06	**0,09**	0,16	ML
MM	0,33	**0,59**	0,97	0,24	**0,43**	0,70	0,18	**0,32**	0,52	0,16	**0,28**	0,45	0,14	**0,25**	0,42	MM
MH	0,54	**0,81**	1,18	0,39	**0,58**	0,85	0,29	**0,43**	0,63	0,25	**0,38**	0,55	0,23	**0,35**	0,51	MH

At 1,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,18	**0,27**	0,49	0,13	**0,19**	0,35	0,10	**0,15**	0,26	0,09	**0,13**	0,23	0,08	**0,12**	0,21	ML
MM	0,43	**0,77**	1,28	0,31	**0,56**	0,92	0,23	**0,42**	0,68	0,20	**0,36**	0,60	0,19	**0,33**	0,55	MM
MH	0,70	**1,06**	1,56	0,51	**0,76**	1,12	0,38	**0,57**	0,83	0,33	**0,50**	0,72	0,30	**0,45**	0,66	MH

At 0,75 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
ALP	0,12	**0,20**	0,28	0,08	**0,15**	0,20	0,06	**0,11**	0,15	0,06	**0,09**	0,13	0,05	**0,09**	0,12	ALP
ML	0,25	**0,37**	0,67	0,18	**0,27**	0,48	0,14	**0,20**	0,36	0,12	**0,17**	0,32	0,11	**0,16**	0,29	ML
MM	0,59	**1,06**	1,77	0,43	**0,76**	1,26	0,32	**0,57**	0,94	0,28	**0,50**	0,81	0,25	**0,45**	0,75	MM
MH	0,96	**1,46**	2,16	0,69	**1,04**	1,53	0,52	**0,78**	1,14	0,45	**0,68**	0,99	0,41	**0,62**	0,90	MH

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

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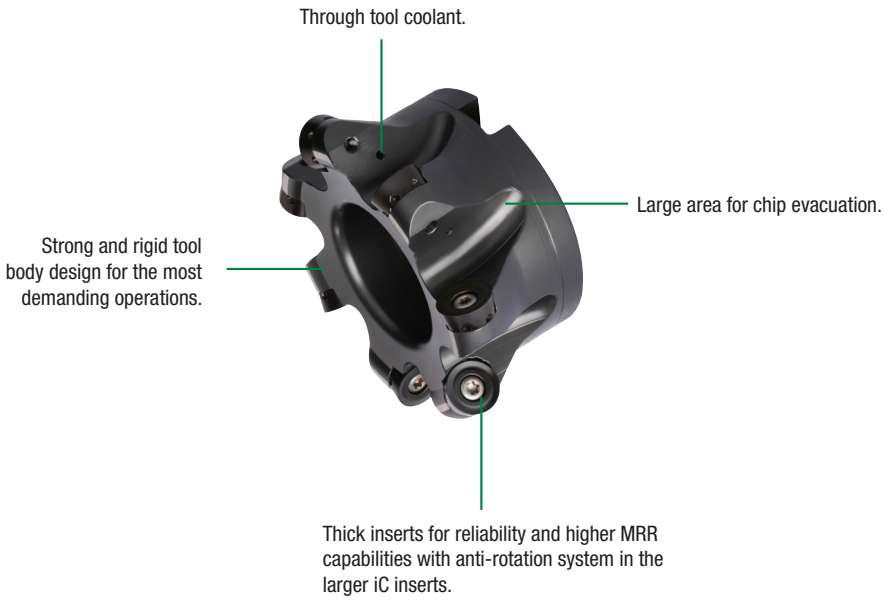
M100™

A trusted multipurpose solution for profiling and copy applications, the M100 Series ensures a reliable platform for all of your copy milling, face milling, helical interpolation, and roughing needs.

- Thick inserts ensure reliability and consistent results.
- General purpose face and copy milling.
- Anti-rotation feature for security.
- Anti-rotation systems in larger iC inserts provide higher MRR capabilities.
- Increased chip evacuation and through tool coolant for enhanced performance.

Materials:

P M K S H

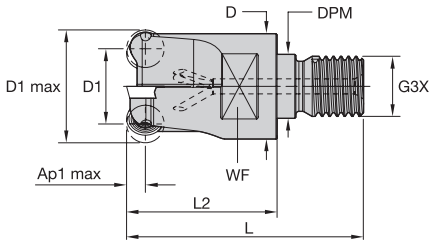


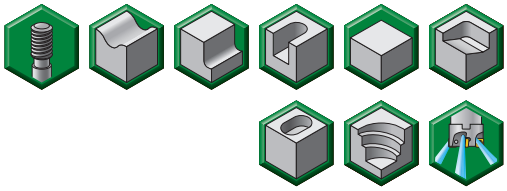


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Screw-On End Mills • Metric



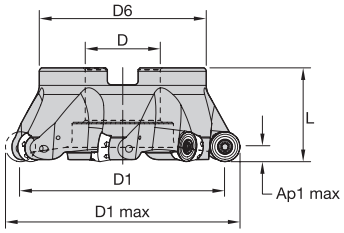


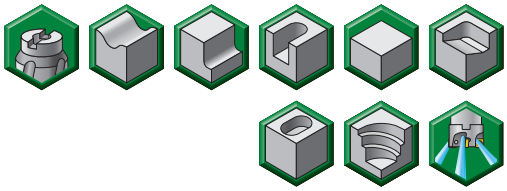


order number	catalogue number	D1 max	D1	D	DPM	G3X	L	L2	WF	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021374	**12391050200**	24	12	22	12,5	M12	52	30	19	6,0	2	10.0°	23000	Yes	0,10
2021378	**12391051000**	35	23	28	17,0	M16	63	40	22	6,0	3	10.8°	19000	Yes	0,20
2021379	**12391051200**	40	28	28	17,0	M16	63	40	22	6,0	4	8.3°	17000	Yes	0,30

Shell Mills • Metric





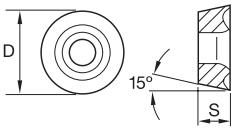


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021342	**12391020000**	50	38	22	40	40	6,0	4	6.8°	15000	Yes	0,20
2021361	**12391024000**	52	40	22	40	40	6,0	4	6.5°	15000	Yes	0,20
2021343	**12391020200**	63	51	27	48	40	6,0	5	4.5°	14000	Yes	0,30
2021344	**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

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Inserts • RDMT-TX



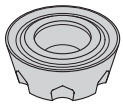


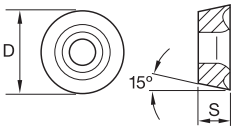
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	TN6525	TN6540	TN7525	TN7535	WS30PM
RDMT1204M0TX	1	12,00	4,76	0,15	2957430	2957432	2020763	2109542	5520247

Inserts • RDHT-TX



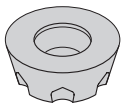


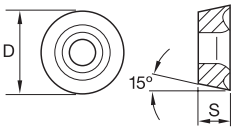
● first choice
○ alternate choice

P		●
M		○
K		
N		
S		
H		

ISO catalogue number	cutting edges	D	S	hm	TN7525
RDHT1204M0TX	1	12,00	4,76	0,12	2020775

Inserts • RDMW-TX





● first choice
○ alternate choice

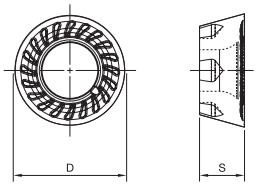
P		○	●	●	●				
M			●	○	○				
K		●	○		○	●			
N									
S			●						
H		●							

ISO catalogue number	cutting edges	D	S	hm	TN2510	TN6540	TN7525	TN7535	WK15CM
RDMW1204M0TX	1	12,00	4,76	0,15	2012594	3353281	2109440	2020741	5427441

Inserts • RDPT-MMX



MMX – 6 insert indexes
MMX4 – 4 insert indexes



● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	TN6540	TN7535	WS40PM
RDPT1204M0SMMX4	1	12,00	4,76	–	-	-	6412898
RDPT1204M0SMMX	1	12,00	4,76	0,18	5176974	5176975	6412897

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Insert Selection Guide

Material Group	Light Machining Geometry	Light Machining Grade	General Purpose Geometry	General Purpose Grade	Heavy Machining Geometry	Heavy Machining Grade
P1–P2	RDMT-TX	TN7525	**RDMT-TX**	**TN6540**	**RDMT-TX**	**TN6540**
P3–P4	RDMT-TX	TN7525	**RDMW-TX**	**TN6540**	**RDMW-TX**	**TN6540**
P5–P6	RDMT-TX	TN7525	**RDPT-MMX**	**TN7535**	**RDPT-MMX**	**TN7535**
M1–M2	RDHT-TX	TN7525	**RDMT-TX**	**TN6540**	**RDPT-MMX**	**TN6540**
M3	RDHT-TX	TN7525	**RDMT-TX**	**TN6540**	**RDPT-MMX**	**TN6540**
K1–K2	RDMW-TX	WK15CM	**RDMW-TX**	**WK15CM**	**RDMW-TX**	**TN7535**
K3	RDHW-MH	TN2510	**RDMW-TX**	**WK15CM**	**RDMW-TX**	**WK15CM**
N1–N2	–	–	**–**	**–**	**–**	**–**
N3	–	–	**–**	**–**	**–**	**–**
S1–S2	–	–	**RDMT-TX**	**TN6540**	**–**	**–**
S3	–	–	**RDMT-TX**	**TN6540**	**–**	**–**
S4	–	–	**RDMT-TX**	**TN6540**	**RDPT-MMX**	**TN6540**
H1	RDHW-MH	TN2510	**RDHW-MH**	**TN2510**	**–**	**–**

Recommended Starting Speeds [m/min]

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

Material Group		TN7535			WK15CM			WS30PM			WS40PM			TTI25		
P	1	545	**475**	445	–	**–**	–	–	**–**	–	–	**–**	–	430	**360**	300
	2	335	**305**	275	–	**–**	–	–	**–**	–	–	**–**	–	310	**250**	215
	3	305	**275**	245	–	**–**	–	–	**–**	–	–	**–**	–	310	**250**	215
	4	230	**210**	190	–	**–**	–	–	**–**	–	–	**–**	–	265	**215**	180
	5	310	**275**	250	–	**–**	–	–	**–**	–	205	**175**	145	320	**235**	200
	6	190	**160**	130	–	**–**	–	–	**–**	–	180	**130**	95	145	**110**	90
M	1	245	**220**	185	–	**–**	–	270	**240**	220	250	**205**	170	480	**310**	215
	2	220	**190**	170	–	**–**	–	245	**215**	175	215	**175**	145	325	**205**	145
	3	175	**155**	140	–	**–**	–	185	**160**	125	175	**130**	100	320	**210**	145
K	1	355	**320**	290	505	**460**	410	–	**–**	–	–	**–**	–	220	**185**	155
	2	280	**250**	230	400	**355**	330	–	**–**	–	–	**–**	–	180	**145**	125
	3	235	**210**	190	335	**300**	275	–	**–**	–	–	**–**	–	145	**125**	100
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30	–	**–**	–
	2	–	**–**	–	–	**–**	–	55	**50**	35	50	**40**	30	–	**–**	–
	3	–	**–**	–	–	**–**	–	65	**55**	35	60	**50**	30	–	**–**	–
	4	–	**–**	–	–	**–**	–	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.

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

At 6,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,35	**0,33**	0,56	0,25	**0,24**	0,40	0,19	**0,18**	0,30	0,16	**0,16**	0,26	0,15	**0,14**	0,24	RDHT-TX
RDMT-TX	0,35	**0,42**	0,70	0,25	**0,30**	0,50	0,19	**0,23**	0,38	0,16	**0,20**	0,33	0,15	**0,18**	0,30	RDMT-TX
RDPT-MMX	0,35	**0,57**	0,93	0,25	**0,41**	0,67	0,19	**0,31**	0,50	0,16	**0,27**	0,43	0,15	**0,25**	0,40	RDPT-MMX
RDHW-MH	0,35	**0,70**	1,08	0,25	**0,50**	0,78	0,19	**0,38**	0,58	0,16	**0,33**	0,50	0,15	**0,30**	0,46	RDHW-MH
RDMW-TX	0,35	**0,70**	1,16	0,25	**0,50**	0,83	0,19	**0,38**	0,62	0,16	**0,33**	0,54	0,15	**0,30**	0,50	RDMW-TX

At 3,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,40	**0,38**	0,64	0,29	**0,28**	0,46	0,22	**0,21**	0,35	0,19	**0,18**	0,30	0,17	**0,17**	0,28	RDHT-TX
RDMT-TX	0,40	**0,48**	0,81	0,29	**0,35**	0,58	0,22	**0,26**	0,43	0,19	**0,23**	0,38	0,17	**0,21**	0,35	RDMT-TX
RDPT-MMX	0,40	**0,66**	1,08	0,29	**0,48**	0,77	0,22	**0,36**	0,58	0,19	**0,31**	0,50	0,17	**0,29**	0,46	RDPT-MMX
RDHW-MH	0,40	**0,81**	1,25	0,29	**0,58**	0,90	0,22	**0,43**	0,67	0,19	**0,38**	0,58	0,17	**0,35**	0,53	RDHW-MH
RDMW-TX	0,40	**0,81**	1,34	0,29	**0,58**	0,96	0,22	**0,43**	0,72	0,19	**0,38**	0,62	0,17	**0,35**	0,57	RDMW-TX

At 1,50 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,53	**0,50**	0,85	**0,38**	**0,36**	0,61	0,28	**0,27**	0,45	0,25	**0,24**	0,40	0,23	**0,22**	0,36	**RDHT-TX**
RDMT-TX	0,53	**0,63**	1,06	**0,38**	**0,46**	0,76	0,28	**0,34**	0,57	0,25	**0,30**	0,50	0,23	**0,27**	0,45	**RDMT-TX**
RDPT-MMX	0,53	**0,87**	1,42	**0,38**	**0,63**	1,01	0,28	**0,47**	0,76	0,25	**0,41**	0,66	0,23	**0,37**	0,60	**RDPT-MMX**
RDHW-MH	0,53	**1,06**	1,65	**0,38**	**0,76**	1,18	0,28	**0,57**	0,88	0,25	**0,50**	0,76	0,23	**0,45**	0,70	**RDHW-MH**
RDMW-TX	0,53	**1,06**	1,78	0,38	**0,76**	1,26	0,28	**0,57**	0,94	0,25	**0,50**	0,82	0,23	**0,45**	0,75	**RDMW-TX**

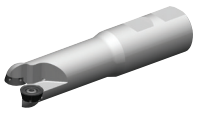
At 0,75 Axial Depth of Cut (ap)

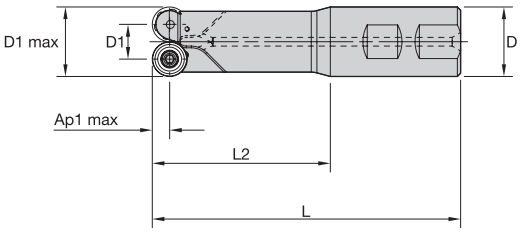
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHT-TX	0,72	**0,69**	1,16	0,52	**0,50**	0,83	0,39	**0,37**	0,62	0,34	**0,32**	0,54	0,31	**0,30**	0,50	RDHT-TX
RDMT-TX	0,72	**0,87**	1,46	0,52	**0,62**	1,04	0,39	**0,47**	0,78	0,34	**0,41**	0,68	0,31	**0,37**	0,62	RDMT-TX
RDPT-MMX	0,72	**1,20**	1,96	0,52	**0,86**	1,39	0,39	**0,64**	1,03	0,34	**0,56**	0,90	0,31	**0,51**	0,82	RDPT-MMX
RDHW-MH	0,72	**1,46**	2,29	0,52	**1,04**	1,62	0,39	**0,78**	1,20	0,34	**0,68**	1,04	0,31	**0,62**	0,95	RDHW-MH
RDMW-TX	0,72	**1,46**	2,46	0,52	**1,04**	1,74	0,39	**0,78**	1,29	0,34	**0,68**	1,12	0,31	**0,62**	1,02	RDMW-TX

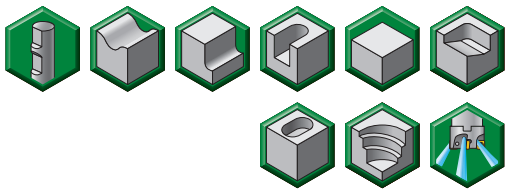
NOTE: Use "Light Machining" value as starting feed rate.

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Weldon® End Mills • RD1605 • Metric



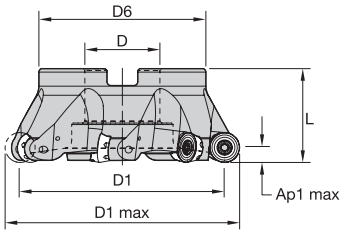


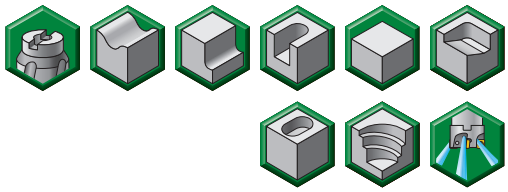


order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021341	12391013800	32	16	32	142	82	8,0	2	7.8°	19000	Yes	1,10

Shell Mills • RD1605 • Metric



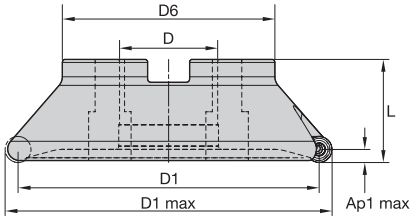


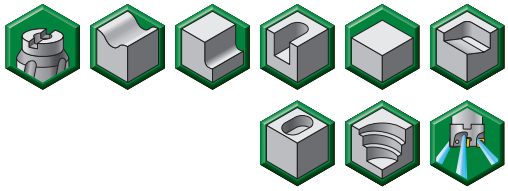


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021347	12391021000	50	34	22	40	40	8,0	4	10.3°	13000	Yes	0,20
2021348	12391021200	63	47	27	48	40	8,0	4	7.0°	12000	Yes	0,30
2021349	12391021400	80	64	27	60	50	8,0	5	4.8°	10000	Yes	0,90

Shell Mills • RC1606 • Metric





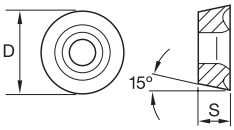


order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	kg
2021358	**12391023400**	50	34	22	40	40	8,0	4	6.0°	13000	Yes	0,20
2021359	**12391023600**	52	36	22	40	40	8,0	4	5.8°	13000	Yes	0,30
2021357	**12391023200**	63	47	27	48	40	8,0	5	4.0°	12000	Yes	0,20
2021352	**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	90	63	8,0	9	1.3°	7000	No	2,90

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Inserts • RDMT-TX



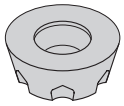


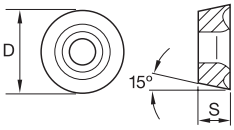
● first choice
○ alternate choice

P	●	●
M	○	○
K		○
N		
S		
H		

ISO catalogue number	cutting edges	D	S	hm	TN7525	TN7535
RDMT1605M0TX	1	16,00	5,56	0,18	2020767	2207645

Inserts • RDMW-TX



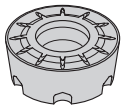


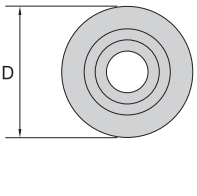
● first choice
○ alternate choice

P	●	●
M	●	○
K	○	○
N		
S	●	
H		

ISO catalogue number	cutting edges	D	S	hm	TN6540	TN7535
RDMW1605M0TX	1	16,00	5,56	0,15	3523083	2020749

Inserts • RCMT-43



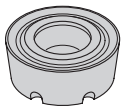


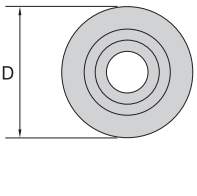
● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	TN6540	TN7525	TN7535
RCMT1606M043M	1	16,00	6,35	0,20	2957537	2020771	2067140

Inserts • RCMT-TX





● first choice
○ alternate choice

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

ISO catalogue number	cutting edges	D	S	hm	TN6525	TN6540	TN7525	TN7535	WK15CM
RCMT1606M0TX	1	16,00	6,35	0,24	2957535	2957427	2012418	2020781	5427442

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Insert Selection Guide • RD1605

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	RDMT-TX	TN6525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
P3–P4	RDMT-TX	TN6525	**RDMW-TX**	**TN6540**	RDMW-TX	TN6540
P5–P6	RDMT-TX	TN7525	**RDMT-TX**	**TN7535**	RDMT-TX	TN7535
M1–M2	RDMT-TX	TN6525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
M3	RDMT-TX	TN6525	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
K1–K2	RDMW-TX	TN2510	**RDMW-TX**	**TN7535**	RDMW-TX	TN7535
K3	RDMW-TX	TN2510	**RDMW-TX**	**TN7535**	RDMW-TX	TN7535
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**RDMT-TX**	**TN6540**	–	–
S3	–	–	**RDMT-TX**	**TN6540**	–	–
S4	–	–	**RDMT-TX**	**TN6540**	RDMT-TX	TN6540
H1	RDMW-TX	TN2510	**RDMW-TX**	**TN2510**	–	–

Recommended Starting Speeds [m/min] • RD1605

Material Group		TN2510			TN6525			TN6540			TN7525			TN7535			TTI25		
P	1	660	**580**	540	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445	430	**360**	300
	2	410	**370**	330	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275	310	**250**	215
	3	370	**330**	305	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245	310	**250**	215
	4	275	**260**	230	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190	265	**215**	180
	5	330	**300**	275	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250	320	**235**	200
	6	230	**205**	175	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130	145	**110**	90
M	1	270	**240**	210	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185	480	**310**	215
	2	245	**210**	190	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170	325	**205**	145
	3	190	**175**	150	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140	320	**210**	145
K	1	420	**360**	300	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290	220	**185**	155
	2	360	**300**	250	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230	180	**145**	125
	3	300	**250**	200	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190	145	**125**	100
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

Recommended Starting Feeds [mm] • RD1605

Light Machining	General Purpose	Heavy Machining

At 8,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,11	**0,35**	0,70	0,08	**0,25**	0,50	0,06	**0,19**	0,38	0,05	**0,16**	0,33	0,05	**0,15**	0,30	RDHX-TX
RDMT-TX	0,23	**0,42**	0,84	0,17	**0,30**	0,60	0,13	**0,23**	0,45	0,11	**0,20**	0,39	0,10	**0,18**	0,36	RDMT-TX
RDMW-TX	0,23	**0,52**	1,05	0,17	**0,38**	0,76	0,13	**0,28**	0,56	0,11	**0,25**	0,49	0,10	**0,23**	0,45	RDMW-TX

At 4,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,13	**0,40**	0,81	0,10	**0,29**	0,58	0,07	**0,22**	0,43	0,06	**0,19**	0,38	0,06	**0,17**	0,35	RDHX-TX
RDMT-TX	0,27	**0,48**	0,97	0,19	**0,35**	0,70	0,14	**0,26**	0,52	0,13	**0,23**	0,45	0,12	**0,21**	0,42	RDMT-TX
RDMW-TX	0,27	**0,60**	1,22	0,19	**0,44**	0,87	0,14	**0,33**	0,65	0,13	**0,28**	0,57	0,12	**0,26**	0,52	RDMW-TX

At 2,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,17	**0,53**	1,06	0,13	**0,38**	0,76	0,09	**0,28**	0,57	0,08	**0,25**	0,50	0,08	**0,23**	0,45	RDHX-TX
RDMT-TX	0,35	**0,63**	1,28	0,25	**0,46**	0,92	0,19	**0,34**	0,68	0,17	**0,30**	0,59	0,15	**0,27**	0,54	RDMT-TX
RDMW-TX	0,35	**0,79**	1,61	0,25	**0,57**	1,15	0,19	**0,43**	0,85	0,17	**0,37**	0,74	0,15	**0,34**	0,68	RDMW-TX

At 1,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
RDHX-TX	0,24	**0,72**	1,46	0,17	**0,52**	1,04	0,13	**0,39**	0,78	0,11	**0,34**	0,68	0,10	**0,31**	0,62	RDHX-TX
RDMT-TX	0,48	**0,87**	1,76	0,35	**0,62**	1,26	0,26	**0,47**	0,93	0,23	**0,41**	0,81	0,21	**0,37**	0,74	RDMT-TX
RDMW-TX	0,48	**1,09**	2,22	0,35	**0,78**	1,58	0,26	**0,58**	1,17	0,23	**0,51**	1,02	0,21	**0,46**	0,93	RDMW-TX

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

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Insert Selection Guide • RC1606

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**	**TN7535**	...TX	TN7535
M1–M2	...TX	TN6525	**...TX**	**TN6540**	...TX	TN6540
M3	...TX	TN6525	**...TX**	**TN6540**	...TX	TN6540
K1–K2	...43	TN2510	**...TX**	**WK15CM**	...TX	WK15CM
K3	...TX	TN6525	**...TX**	**WK15CM**	...TX	WK15CM
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	–	–	**–**	**–**	–	–
S3	–	–	**–**	**–**	–	–
S4	...43M	TN6540	**...TX**	**TN6540**	...TX	TN6540
H1	–	–	**...TX**	**TN2510**	–	–

Recommended Starting Speeds [m/min] • RC1606

Material Group		TN2510			TN6525			TN6540			TN7525			TN7535			WK15CM		
P	1	660	**580**	540	410	**320**	280	360	**280**	240	410	**310**	280	545	**475**	445	–	**–**	–
	2	410	**370**	330	320	**250**	215	250	**190**	170	310	**250**	215	335	**305**	275	–	**–**	–
	3	370	**330**	305	280	**215**	185	215	**170**	140	280	**215**	185	305	**275**	245	–	**–**	–
	4	275	**260**	230	235	**170**	145	180	**130**	110	235	**170**	145	230	**210**	190	–	**–**	–
	5	330	**300**	275	310	**235**	200	240	**180**	150	310	**235**	200	310	**275**	250	–	**–**	–
	6	230	**205**	175	205	**160**	130	160	**120**	100	205	**160**	130	190	**160**	130	–	**–**	–
M	1	270	**240**	210	190	**120**	80	130	**80**	60	245	**220**	185	245	**220**	185	–	**–**	–
	2	245	**210**	190	120	**80**	50	80	**50**	40	220	**190**	170	220	**190**	170	–	**–**	–
	3	190	**175**	150	125	**80**	55	85	**50**	40	175	**155**	140	175	**155**	140	–	**–**	–
K	1	420	**360**	300	275	**245**	220	220	**205**	180	380	**280**	240	355	**320**	290	505	**460**	410
	2	360	**300**	250	215	**190**	180	175	**155**	140	325	**240**	200	280	**250**	230	400	**355**	330
	3	300	**250**	200	180	**160**	145	155	**145**	125	240	**200**	170	235	**210**	190	335	**300**	275
N	1	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
S	1	–	**–**	–	–	**–**	–	50	**35**	30	–	**–**	–	–	**–**	–	–	**–**	–
	2	–	**–**	–	–	**–**	–	25	**20**	10	–	**–**	–	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	70	**40**	30	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	60	**30**	25	–	**–**	–	–	**–**	–	–	**–**	–
H	1	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	2	145	**110**	70	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	3	115	**80**	45	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–

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

Recommended Starting Feeds [mm] • RC1606

Light Machining	General Purpose	Heavy Machining

At 8,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,46	**0,60**	0,93	0,33	**0,44**	0,67	0,25	**0,33**	0,50	0,22	**0,28**	0,44	0,20	**0,26**	0,40	...43
...TX	0,46	**0,70**	1,12	0,33	**0,50**	0,81	0,25	**0,38**	0,60	0,22	**0,33**	0,52	0,20	**0,30**	0,48	...TX

At 4,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,54	**0,70**	1,08	0,39	**0,50**	0,78	0,29	**0,38**	0,58	0,25	**0,33**	0,50	0,23	**0,30**	0,46	...43
...TX	0,54	**0,81**	1,30	0,39	**0,58**	0,93	0,29	**0,43**	0,69	0,25	**0,38**	0,61	0,23	**0,35**	0,55	...TX

At 2,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,70	**0,92**	1,42	0,51	**0,66**	1,02	0,38	**0,49**	0,76	0,33	**0,43**	0,66	0,30	**0,39**	0,60	...43
...TX	0,70	**1,06**	1,72	0,51	**0,76**	1,23	0,38	**0,57**	0,91	0,33	**0,50**	0,79	0,30	**0,45**	0,73	...TX

At 1,00 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...43	0,96	**1,26**	1,97	0,69	**0,90**	1,40	0,52	**0,67**	1,04	0,45	**0,59**	0,90	0,41	**0,54**	0,83	...43
...TX	0,96	**1,46**	2,38	0,69	**1,04**	1,68	0,52	**0,78**	1,25	0,45	**0,68**	1,08	0,41	**0,62**	0,99	...TX

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

= ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

SOLID END MILLING

HIGH-PERFORMANCE SOLID CARBIDE END MILLS

Pages B4–B57

- VariMill I™
- VariMill II™
- VariMill III™
- Victory™ X-Feed™
- HP Finishing
- HP Roughing





GENERAL PURPOSE SOLID CARBIDE END MILLS

Pages B58–B78

- GP 2-Flute
- GP 3-Flute
- GP 4-Flute

ALL-STAR

AEROSPACE TECHNOLOGY



WIDIA drills for composite machining utilise PCD and diamond coatings made for the machining of aerospace CFRP (Carbon Fibre Reinforced Plastics). These coatings enable longer tool life at much higher machining speeds.

Integral Blade Rotor (IBR) machining end mills are designed to match a multi-level machining process for the airfoils, followed by the fillet feature, which works for roughing and finishing operations.

WIDIA-Hanita™ end mills produce consistent performance each and every run, allowing the production of more parts per tool and less downtime, while machining tough materials like INCONEL® depressor fine seals.

AEROSPACE

WIDIA offers machining strategies and innovative tooling technology specifically engineered for the aerospace industry to increase productivity and reduce costs.

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HIGH-PERFORMANCE SOLID CA

VARIMILL I™

Pages B6–B13

This 4-flute geometry is designed with unequal flute spacing for plunging, slotting, and profiling at the highest possible feed rates for a wide range of materials.





VARIMILL II™

Pages B14–B25

This 5-flute geometry is designed with unequal flute spacing for advanced milling jobs in a wide range of materials.

VARIMILL III™

Pages B26–B30

This 7-flute geometry is designed with unequal flute spacing and is designed to provide the highest Metal Removal Rates (MRR) and extended tool life in the most demanding materials in the aerospace industry.



RBIDE END MILLS

ALL-STAR

VICTORY™ X-FEED™

Pages B32–B35

X-Feed for high-feed milling combines roughing and semi-finishing into one operation by taking shallow depths-of-cut at extremely high feed rates to maximise Metal Removal Rates (MRR).





HP FINISHING

Pages B36–B40

Only the finest carbide substrates with market-leading geometries and state-of-the-art surface technology are used to ensure the highest quality finishing end mills are produced. These tools are fully compliant with NAS specifications. Whether you require higher metal removal rates, improved surface finishes, fewer passes, or longer tool life, WIDIA-Hanita™ high-performance finishing end mills deliver the reliability and consistency you can depend on during your critical finishing operations.

HP ROUGHING

Pages B42–B50

Special proprietary carbide substrates and state-of-the-art surface technology, combined with unique geometries, provides end users with the capability to significantly reduce machining time with heavier and deeper cuts, fewer passes, and faster surface speed. WIDIA™ geometries are uniquely formed and fine-tuned to optimise chip form, size, and evacuation generated by a given workpiece material.



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VariMill I™

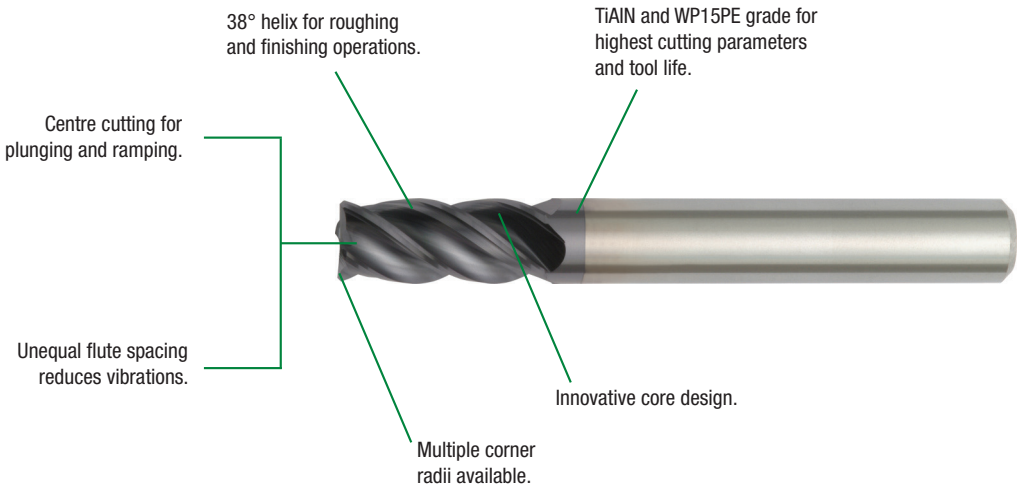
High-Performance Solid Carbide End Mills

WIDIA HANITA

Four unequally spaced flutes to increase your output with less tool changes and increased Metal Removal Rates (MRR).

Materials:

P M K S H





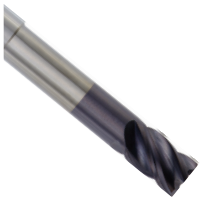
4777 Series

- High metal removal rates and tool life in:
  — Stainless steels, steels, and alloyed steels.
  — High-temperature alloys and titanium.
- Radii, sharp, and corner chamfer configurations.



47N0 Series

- Centre cutting ball nose series.
- Benefit from long reach design for deep cavities.

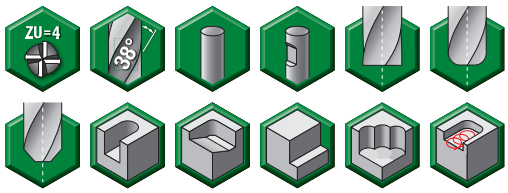


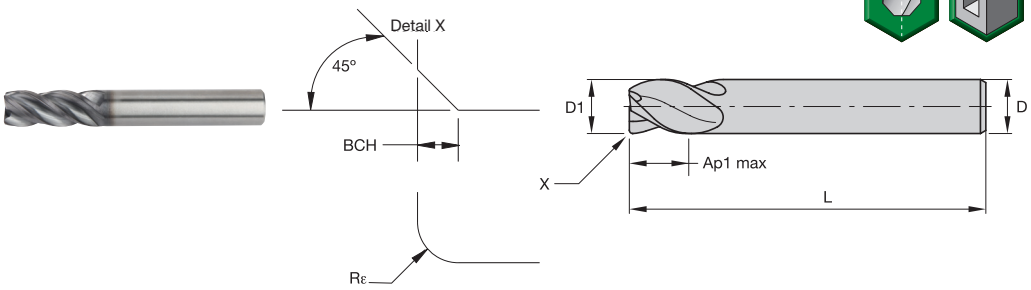
47N7 Series

- Stainless steel and steel geometry design.
- Sharp and corner chamfer configuration.
- Benefit from long reach and neck design for deep cavities.

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B7–B13.

VariMill I™ • Series 4777 • Metric





● first choice
○ alternate choice

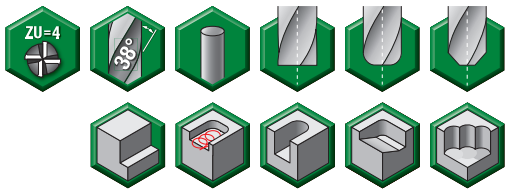
P		●
M		●
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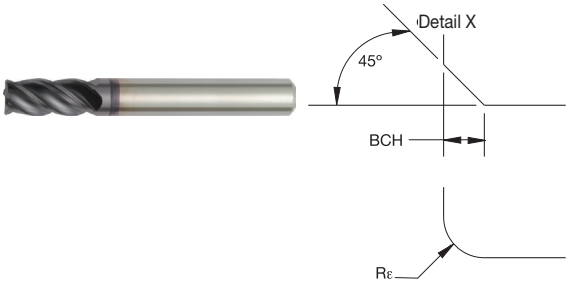
catalogue number	D1	D	length of cut Ap1 max	length L	Rε	BCH	SS	WP15PE
477704001T	4,0	6	12,00	55	0,20	–	–	**5576753**
477704002T	4,0	6	12,00	55	–	0,40	–	**5576751**
477705012T	5,0	6	13,00	57	0,20	–	–	**5576757**
4777050Z2T	5,0	6	13,00	57	–	–	–	**5576758**
477706002T	6,0	6	13,00	57	–	0,40	–	**5576759**
477706002W	6,0	6	13,00	57	–	0,40	W	**5576760**
477706012T	6,0	6	13,00	57	0,20	–	–	**5576761**
4777060Z2T	6,0	6	13,00	57	–	–	–	**5576762**
477707003T	7,0	8	16,00	63	–	0,40	–	**5576763**
477707013T	7,0	8	16,00	63	0,20	–	–	**5576765**
4777070Z3T	7,0	8	16,00	63	–	–	–	**5576766**
477708003T	8,0	8	16,00	63	–	0,40	–	**5576767**
477708003W	8,0	8	16,00	63	–	0,40	W	**5576768**
477708013T	8,0	8	16,00	63	0,20	–	–	**5576769**
4777080Z3T	8,0	8	16,00	63	–	–	–	**5576770**
477709014T	9,0	10	19,00	72	0,20	–	–	**5576773**
4777090Z4T	9,0	10	19,00	72	–	–	–	**5576774**
477710004T	10,0	10	22,00	72	–	0,50	–	**5576775**
477710004W	10,0	10	22,00	72	–	0,50	W	**5576776**
477710024T	10,0	10	22,00	72	0,30	–	–	**5576777**
4777100Z4T	10,0	10	22,00	72	–	–	–	**5576778**
4777110Z5T	11,0	12	26,00	83	–	–	–	**5576779**
477712005T	12,0	12	26,00	83	–	0,50	–	**5576790**
477712005W	12,0	12	26,00	83	–	0,50	W	**5576791**
477712025T	12,0	12	26,00	83	0,30	–	–	**5576792**
4777120R5TP	12,0	12	26,00	83	3,00	–	–	**6471877**
4777120Z5T	12,0	12	26,00	83	–	–	–	**5576793**
477714014W	14,0	14	26,00	83	–	0,50	W	**5576795**
477714015T	14,0	14	26,00	83	–	0,50	–	**5576794**
477716006T	16,0	16	32,00	92	–	0,50	–	**5576796**
477716006W	16,0	16	32,00	92	–	0,50	W	**5576797**
477716026T	16,0	16	32,00	92	0,30	–	–	**5576798**
4777160Z6T	16,0	16	32,00	92	–	–	–	**5576799**
477718018T	18,0	18	32,00	92	–	0,50	–	**5576810**
477720007T	20,0	20	38,00	104	–	0,50	–	**5576812**
477720007W	20,0	20	38,00	104	–	0,50	W	**5576813**
47772002T	20,0	20	38,00	104	0,30	–	–	**5576814**
477725008T	25,0	25	45,00	121	–	0,50	–	**5576816**
477725008W	25,0	25	45,00	121	–	0,50	W	**5576817**

NOTE: SS = Shank Style
W = Weldon®

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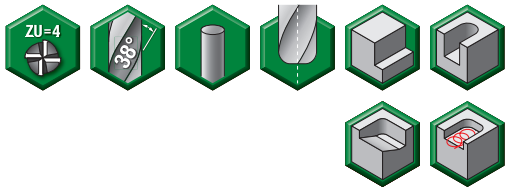


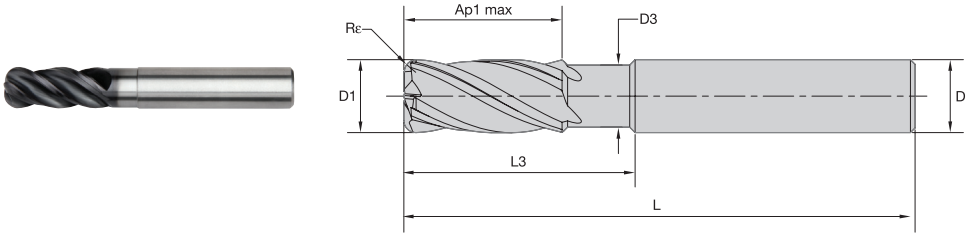
● first choice
○ alternate choice

P		●
M		●
K		●
N		
S		○
H		○

catalogue number	D1	D	length of cut Ap1 max	length L	Rε	BCH	TiAlN-LT
4777040Z2LT	4,0	6	12,00	55	–	–	3077757
477705012LT	5,0	6	13,00	57	0,20	–	3077745
477706012LT	6,0	6	13,00	57	0,20	–	3077744
4777200Z7LT	20,0	20	38,00	104	–	–	3077747
477725008LT	25,0	25	45,00	121	–	0,50	1920454

VariMill I • Series 47N7 • Metric





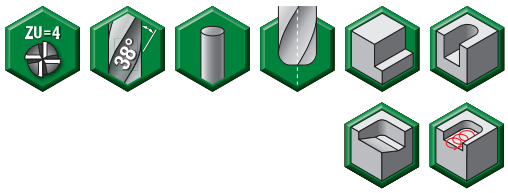
● first choice
○ alternate choice

P		●
M		●
K		○
N		
S		○
H		●

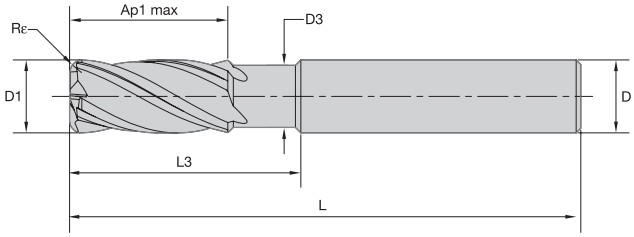
catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	WP15PE
47N720007MT	20,0	20	19,00	38,00	55,00	104	1,00	3462491

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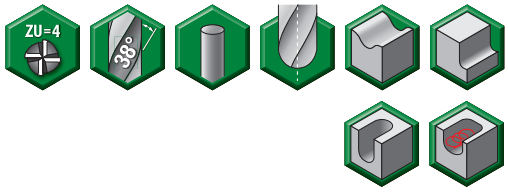


● first choice
○ alternate choice

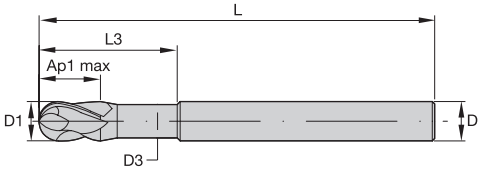
P	●
M	●
K	○
N	
S	○
H	●

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	TiAlN-LT
47N704012LT	4,0	6	3,60	12,00	16,00	55	0,50	**3462451**
47N706002LT	6,0	6	5,50	13,00	21,00	57	0,50	**3462457**
47N706012LT	6,0	6	5,50	13,00	21,00	57	1,00	**3462459**
47N708003LT	8,0	8	7,50	16,00	27,00	63	0,50	**3462462**
47N708013LT	8,0	8	7,50	16,00	27,00	63	1,00	**3462464**
47N710004LT	10,0	10	9,50	22,00	32,00	72	0,50	**3462468**
47N710014LT	10,0	10	9,50	22,00	32,00	72	1,00	**3462470**
47N710024LT	10,0	10	9,50	22,00	32,00	72	1,50	**3462472**
47N710034LT	10,0	10	9,50	22,00	32,00	72	2,00	**3462473**
47N712005LT	12,0	12	11,50	26,00	38,00	83	0,50	**3462475**
47N712015LT	12,0	12	11,50	26,00	38,00	83	1,00	**3462477**
47N712035LT	12,0	12	11,50	26,00	38,00	83	2,00	**3462480**
47N712045LT	12,0	12	11,50	26,00	38,00	83	4,00	**3462482**
47N716006LT	16,0	16	15,00	32,00	44,00	92	1,00	**3462484**
47N716016LT	16,0	16	15,00	32,00	44,00	92	2,00	**3462486**
47N716026LT	16,0	16	15,00	32,00	44,00	92	4,00	**3462488**
47N720017LT	20,0	20	19,00	38,00	55,00	104	2,00	**3462492**

VariMill I • Series 47N0 • Metric





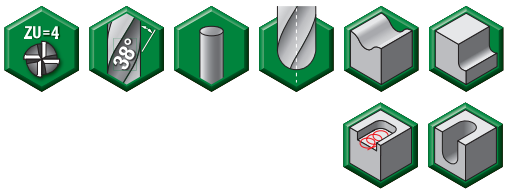


● first choice
○ alternate choice

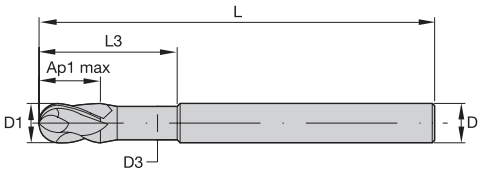
P	●
M	●
K	●
N	
S	○
H	●

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	WP15PE
47N005002T	5,0	6	4,70	9,00	15,00	57	**5576818**
47N006002T	6,0	6	5,64	10,00	15,00	57	**5576819**
47N008003T	8,0	8	7,52	12,00	20,00	63	**5576820**
47N010004T	10,0	10	9,40	14,00	25,00	72	**5576821**
47N012005T	12,0	12	11,28	16,00	30,00	83	**5576822**
47N016006T	16,0	16	15,04	22,00	38,00	92	**5576823**
47N020007T	20,0	20	18,80	26,00	50,00	104	**5576824**

VariMill I™ • Series 47N0 • TIALN-LT • Metric







● first choice
○ alternate choice

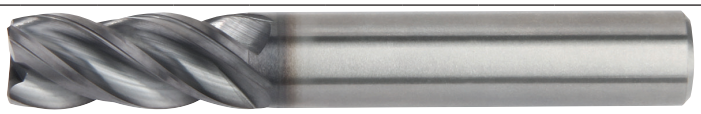
P		●
M		●
K		●
N		
S		○
H		●

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	TiAlN-LT
47N006002LT	6,0	6	5,64	10,00	15,00	57	**2605590**

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Application Data • VariMill I™ • Series 4777 • Metric



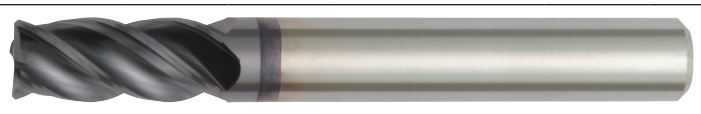


Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • VariMill I • Series 4777 • TIALN-LT • Metric





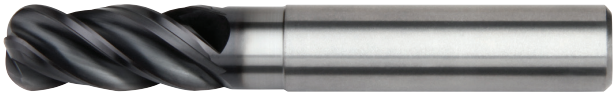
Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	TiAlN Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameter.

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Application Data • VariMill I™ • Series 47N7 • Metric





Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min	–	max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
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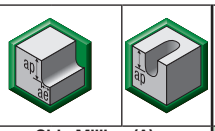


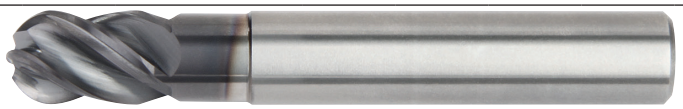
Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min	–	max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
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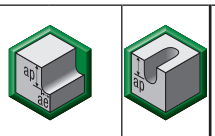


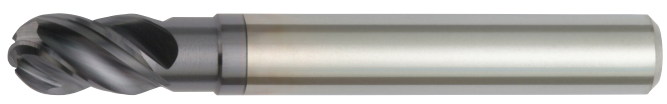


Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,25 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,25 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,5 x D	1 x D	140	–	190	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,25 x D	0,5 x D	1 x D	120	–	160	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,25 x D	0,5 x D	0,75 x D	90	–	150	fz	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,25 x D	0,5 x D	1 x D	60	–	100	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1,25 x D	0,5 x D	0,75 x D	50	–	75	fz	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1,25 x D	0,5 x D	1 x D	90	–	115	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,5 x D	1 x D	60	–	80	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,25 x D	0,5 x D	1 x D	60	–	70	fz	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1,25 x D	0,5 x D	1 x D	120	–	150	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,5 x D	1 x D	110	–	140	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,25 x D	0,5 x D	1 x D	110	–	130	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1 x D	0,3 x D	0,3 x D	50	–	90	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,25 x D	0,5 x D	1 x D	60	–	80	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	4	1,25 x D	0,5 x D	1 x D	50	–	60	fz	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1,25 x D	0,5 x D	0,75 x D	80	–	140	fz	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
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Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 5,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,036	0,044	0,060	0,072	0,083	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,030	0,036	0,050	0,061	0,070	0,087	0,101
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,027	0,033	0,045	0,054	0,062	0,077	0,088
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,024	0,029	0,040	0,048	0,056	0,070	0,081
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,020	0,025	0,034	0,040	0,047	0,057	0,065
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,030	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,024	0,029	0,040	0,048	0,056	0,070	0,081
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,020	0,025	0,034	0,040	0,047	0,057	0,065
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,036	0,044	0,060	0,072	0,083	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,030	0,036	0,050	0,061	0,070	0,087	0,101
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,024	0,029	0,040	0,048	0,056	0,070	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,030	0,036	0,050	0,061	0,070	0,087	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,016	0,019	0,026	0,032	0,037	0,046	0,054
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,024	0,029	0,040	0,048	0,056	0,070	0,081
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,021	0,026	0,037	0,045	0,052	0,064	0,074
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,027	0,033	0,045	0,054	0,062	0,077	0,088

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VariMill II™

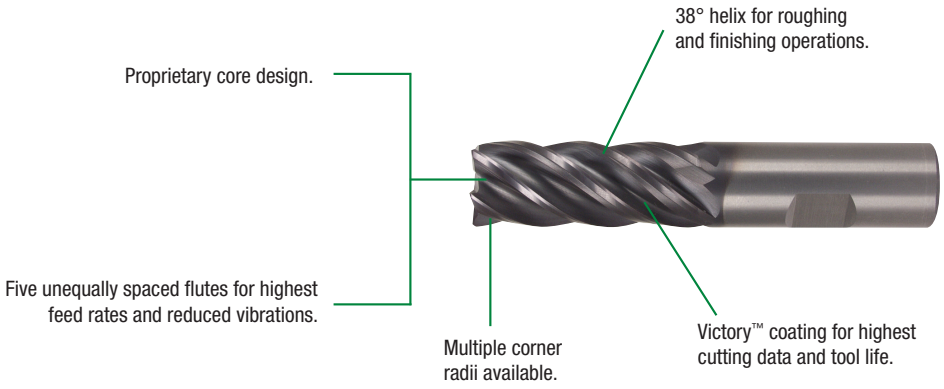
High-Performance Solid Carbide End Mills

Five unequally spaced flutes to increase your output with less tool changes and increased Metal Removal Rates (MRR).

Materials:

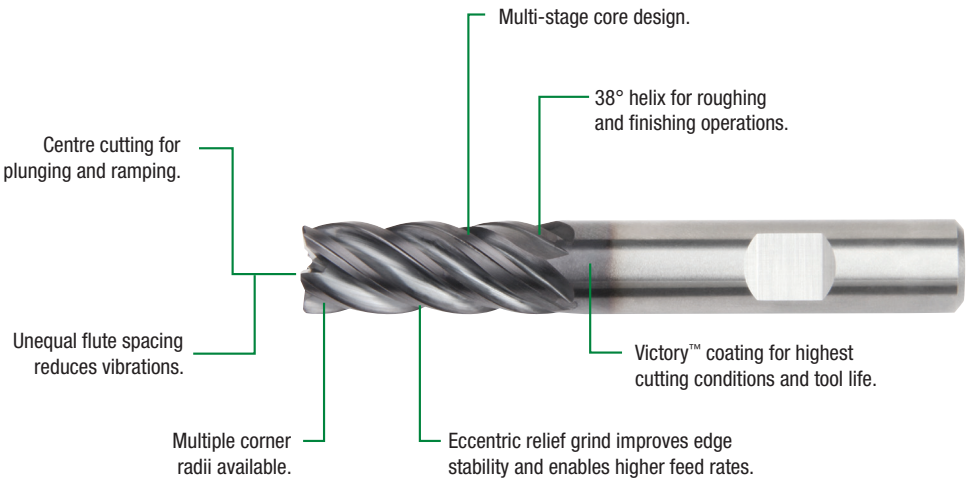
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VariMill II™



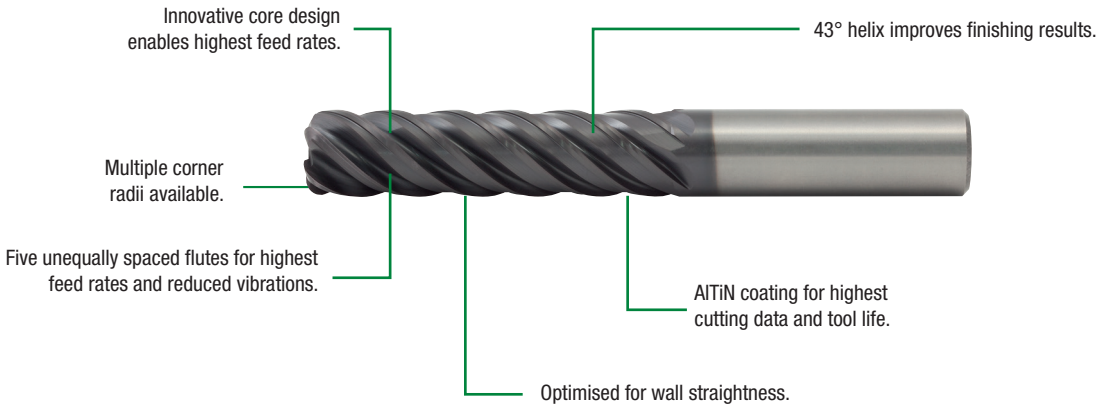
WIDIA VICTORY

VariMill II™ ER



WIDIA VICTORY

VariMill II™ Long



VariMill II™



577C Series

- High metal removal rates and tool life in:
  — Stainless steels, steels, and alloyed steels.
  — Cast iron.
  — High-temperature alloys and titanium.
- Corner radii and sharp edges.
- Centre cutting.



57NC Series

- Steels, stainless steels, and high-temperature alloys.
- Radii corner and neck design for depths requiring additional passes.
- Centre cutting.



5777/57N8 Series

- High metal removal rates and tool life in:
  — Stainless steels, steels, and alloyed steels.
  — Cast iron.
  — High-temperature alloys and titanium.
- Corner radii and sharp edges.
- Non-centre cutting.

VariMill II™ ER



577E Series

- Eccentric relief for edge stability and strength.
- Extensive radii corner offering.



57NE Series

- Eccentric relief for edge stability and strength.
- Extensive radii corner offering.
- Neck design for depths requiring additional passes.

VariMill II™ Long

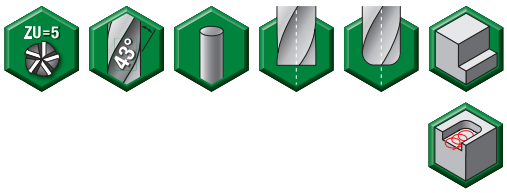


5718 Series

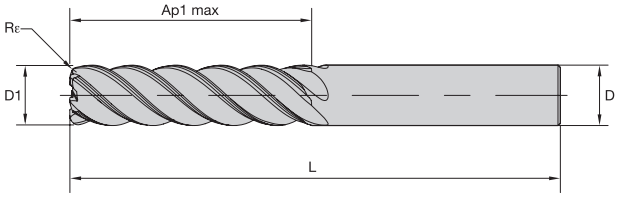
- Highest surface quality and tool life in:
  — Titanium.
  — Stainless steels.
- Corner radii and sharp edges.
- 4 x D length of cut.
- Non-centre cutting.

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B16–B25.

VariMill II™ • Series 5718 • Metric





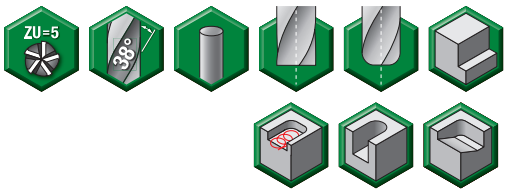


● first choice
○ alternate choice

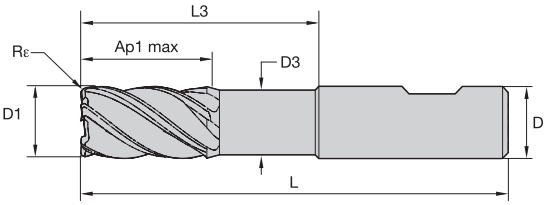
P		●
M		●
K		○
N		
S		●
H		●

catalogue number	D1	D	length of cut Ap1 max	length L	Rε	AlTiN-MT
571806002MT	6,0	6	24,00	76	–	**5096566**
571806012MT	6,0	6	24,00	76	0,50	**5096567**
571806022MT	6,0	6	24,00	76	1,00	**5096568**
571808013MT	8,0	8	32,00	76	0,50	**5096660**
571808023MT	8,0	8	32,00	76	1,00	**5096661**
571810004MT	10,0	10	40,00	100	–	**4124297**
571810014MT	10,0	10	40,00	100	0,50	**5096662**
571812005MT	12,0	12	48,00	125	–	**4124298**
571812015MT	12,0	12	48,00	125	0,50	**5096666**
571812025MT	12,0	12	48,00	125	1,00	**5096667**
571814054MT	14,0	14	56,00	120	4,00	**5096755**
571816006MT	16,0	16	64,00	141	–	**4124300**
571816016MT	16,0	16	64,00	141	0,50	**5096756**
571816026MT	16,0	16	64,00	141	1,00	**5096757**
571816036MT	16,0	16	64,00	141	2,00	**5096758**
571816046MT	16,0	16	64,00	141	3,00	**5096759**
571816056MT	16,0	16	64,00	141	4,00	**5096800**
571820007MT	20,0	20	80,00	150	–	**4124302**
571820017MT	20,0	20	80,00	150	0,50	**5096805**
571820027MT	20,0	20	80,00	150	1,00	**5096806**
571820037MT	20,0	20	80,00	150	2,00	**5096807**
571820047MT	20,0	20	80,00	150	3,00	**5096808**
571820057MT	20,0	20	80,00	150	4,00	**5096809**
571825008MT	25,0	25	100,00	170	–	**4124323**
571825018MT	25,0	25	100,00	170	0,50	**5096860**
571825028MT	25,0	25	100,00	170	1,00	**5096861**
571825038MT	25,0	25	100,00	170	2,00	**5096862**
571825048MT	25,0	25	100,00	170	3,00	**5096863**

VariMill II™ • Series 57N8 • Metric





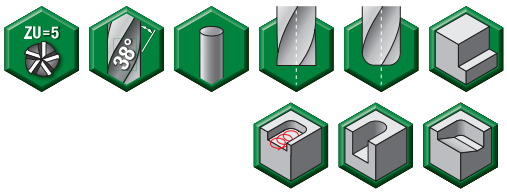


● first choice
○ alternate choice

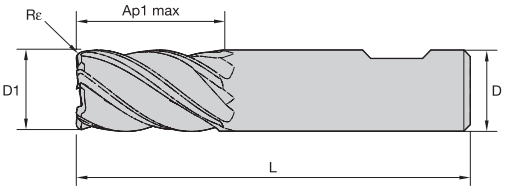
P		●
M		●
K		●
N		
S		○
H		○
		WS15PE

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	WS15PE
57N806002MT	6,0	6	5,60	13,00	18,00	63	–	3524626
57N812035MT	12,0	12	11,28	26,00	36,00	83	1,00	3524648
57N812055MT	12,0	12	11,28	26,00	36,00	83	2,00	3524649
57N8120R5MTK	12,0	12	11,28	26,00	36,00	83	1,50	6492827
57N816036MT	16,0	16	15,05	32,00	48,00	100	1,00	3524652

VariMill II • Series 5777 • Metric







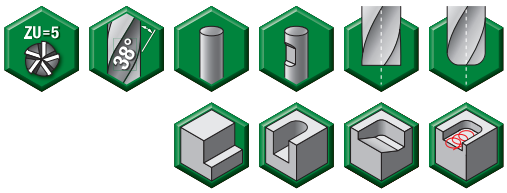
● first choice
○ alternate choice

P		●
M		●
K		●
N		
S		○
H		○

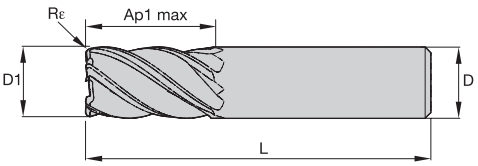
catalogue number	D1	D	length of cut Ap1 max	length L	Rε	WP15PE
577704002MT	4,0	6	11,00	55	0,25	3524587
577706002ET	6,0	6	13,00	57	0,50	6525049
577706002MT	6,0	6	13,00	57	0,40	3524590
577708003KT	8,0	8	19,00	63	1,50	6525182
577708003MT	8,0	8	19,00	63	0,50	3524593
577708013MT	8,0	8	19,00	63	–	3524592
577710004MT	10,0	10	22,00	72	0,50	3524596
577710014MT	10,0	10	22,00	72	–	3524595
577712005MT	12,0	12	26,00	83	0,75	3524598
577712015MT	12,0	12	26,00	83	–	3524597
577716006MT	16,0	16	32,00	92	0,75	3524601

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VariMill II™ • Series 577C • Metric







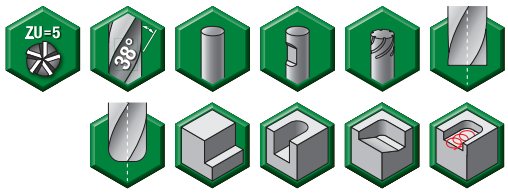
● first choice
○ alternate choice

P		●
M		●
K		●
N		
S		○
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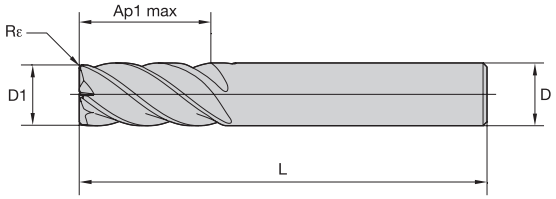
catalogue number	D1	D	length of cut Ap1 max	length L	Rε	SS	WP15PE
577C04002T	4,0	6	11,00	55	0,25	–	**5578866**
577C04002W	4,0	6	11,00	55	0,25	W	**5578867**
577C04012T	4,0	6	11,00	55	–	–	**5578868**
577C05002T	5,0	6	13,00	57	0,25	–	**5578990**
577C05002W	5,0	6	13,00	57	0,25	W	**5578991**
577C06002T	6,0	6	13,00	57	0,40	–	**5578992**
577C06002W	6,0	6	13,00	57	0,40	W	**5578993**
577C06012T	6,0	6	13,00	57	–	–	**5578994**
577C08003T	8,0	8	19,00	63	0,50	–	**5578997**
577C08003W	8,0	8	19,00	63	0,50	W	**5578998**
577C08013T	8,0	8	19,00	63	–	–	**5578999**
577C10004T	10,0	10	22,00	72	0,50	–	**5579023**
577C10004W	10,0	10	22,00	72	0,50	W	**5579024**
577C10014T	10,0	10	22,00	72	–	–	**5579025**
577C12005T	12,0	12	26,00	83	0,75	–	**5579026**
577C12005W	12,0	12	26,00	83	0,75	W	**5579027**
577C12015T	12,0	12	26,00	83	–	–	**5579028**
577C14004T	14,0	14	26,00	83	0,75	–	**5579029**
577C14004W	14,0	14	26,00	83	0,75	W	**5579040**
577C14014T	14,0	14	26,00	83	–	–	**5579041**
577C16006T	16,0	16	32,00	92	0,75	–	**5579042**
577C16006W	16,0	16	32,00	92	0,75	W	**5579043**
577C16016T	16,0	16	32,00	92	–	–	**5579044**
577C20007T	20,0	20	38,00	104	0,75	–	**5579047**
577C20007W	20,0	20	38,00	104	0,75	W	**5579048**
577C20017T	20,0	20	38,00	104	–	–	**5579049**

NOTE: SS = Shank Style
W = Weldon®

VariMill II™ ER • Series 577E • Metric







● first choice
○ alternate choice

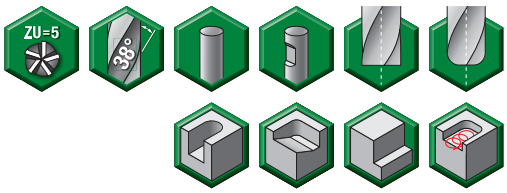
P	○
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S	●
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catalogue number	D1	D	length of cut Ap1 max	length L	Rε	SS	WS15PE
577E12015W	12,0	12	26,00	83	0,75	W	**5599176**
577E16006V	16,0	16	32,00	92	—	V	**5599177**
577E16016V	16,0	16	32,00	92	0,75	V	**5599178**
577E16016W	16,0	16	32,00	92	0,75	W	**5599179**
577E20007V	20,0	20	38,00	104	—	V	**5599180**
577E20017V	20,0	20	38,00	104	0,75	V	**5599181**
577E20017W	20,0	20	38,00	104	0,75	W	**5599182**

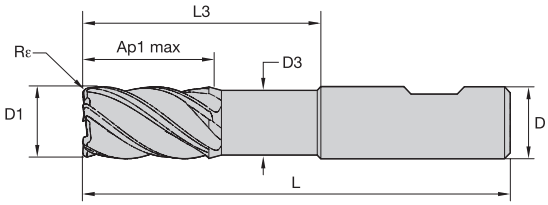
NOTE: SS = Shank Style
W = Weldon®
V= Safe-Lock™

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VariMill II™ • Series 57NC • Metric







● first choice
○ alternate choice

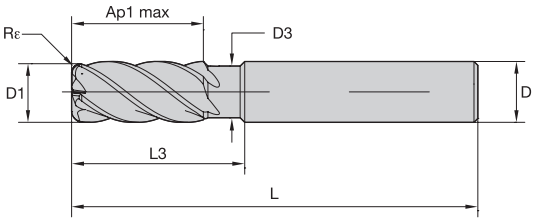
P		○
M		○
K		
N		
S		●
H		●

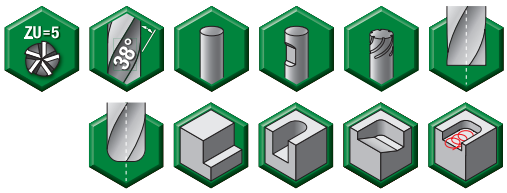
catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	SS	WS15PE
57NC06002T	6,0	6	5,64	13,00	18,00	63	–	–	**5598906**
57NC06022T	6,0	6	5,64	13,00	18,00	63	0,50	–	**5598907**
57NC06032T	6,0	6	5,64	13,00	18,00	63	1,00	–	**5598909**
57NC06042W	6,0	6	5,64	13,00	18,00	63	1,50	W	**5599071**
57NC08003T	8,0	8	7,52	19,00	24,00	76	–	–	**5599072**
57NC08023T	8,0	8	7,52	19,00	24,00	76	0,50	–	**5599073**
57NC08023W	8,0	8	7,52	19,00	24,00	76	0,50	W	**5599074**
57NC08033T	8,0	8	7,52	19,00	24,00	76	1,00	–	**5599075**
57NC08033W	8,0	8	7,52	19,00	24,00	76	1,00	W	**5599076**
57NC08053W	8,0	8	7,52	19,00	24,00	76	2,00	W	**5599077**
57NC10004T	10,0	10	9,40	22,00	30,00	76	–	–	**5599078**
57NC10024T	10,0	10	9,40	22,00	30,00	76	0,50	–	**5599079**
57NC10024W	10,0	10	9,40	22,00	30,00	76	0,50	W	**5599080**
57NC10034T	10,0	10	9,40	22,00	30,00	76	1,00	–	**5599081**
57NC10034W	10,0	10	9,40	22,00	30,00	76	1,00	W	**5599082**
57NC10054T	10,0	10	9,40	22,00	30,00	76	2,00	–	**5599083**
57NC12005T	12,0	12	11,28	26,00	36,00	83	–	–	**5599085**
57NC12025T	12,0	12	11,28	26,00	36,00	83	0,50	–	**5599086**
57NC12025W	12,0	12	11,28	26,00	36,00	83	0,50	W	**5599087**
57NC12035T	12,0	12	11,28	26,00	36,00	83	1,00	–	**5599088**
57NC12055T	12,0	12	11,28	26,00	36,00	83	2,00	–	**5599090**
57NC12055W	12,0	12	11,28	26,00	36,00	83	2,00	W	**5599091**
57NC16006T	16,0	16	15,04	32,00	48,00	100	–	–	**5599092**
57NC16026T	16,0	16	15,04	32,00	48,00	100	0,50	–	**5599093**
57NC16026W	16,0	16	15,04	32,00	48,00	100	0,50	W	**5598905**
57NC16036T	16,0	16	15,04	32,00	48,00	100	1,00	–	**5599094**
57NC16036W	16,0	16	15,04	32,00	48,00	100	1,00	W	**5599095**
57NC16056T	16,0	16	15,04	32,00	48,00	100	2,00	–	**5599096**
57NC16076T	16,0	16	15,04	32,00	48,00	100	3,00	–	**5599098**
57NC16076W	16,0	16	15,04	32,00	48,00	100	3,00	W	**5599099**
57NC20007T	20,0	20	18,80	38,00	60,00	115	–	–	**5599100**
57NC20027T	20,0	20	18,80	38,00	60,00	115	0,50	–	**5599101**
57NC20027W	20,0	20	18,80	38,00	60,00	115	0,50	W	**5599102**
57NC20037T	20,0	20	18,80	38,00	60,00	115	1,00	–	**5599103**
57NC20037W	20,0	20	18,80	38,00	60,00	115	1,00	W	**5599104**
57NC20057T	20,0	20	18,80	38,00	60,00	115	2,00	–	**5599105**
57NC20077T	20,0	20	18,80	38,00	60,00	115	3,00	–	**5599107**
57NC20077W	20,0	20	18,80	38,00	60,00	115	3,00	W	**5599108**
57NC25028T	25,0	25	23,50	45,00	75,00	135	0,50	–	**5599112**
57NC25058T	25,0	25	23,50	45,00	75,00	135	2,00	–	**5599116**

NOTE: SS = Shank Style
W = Weldon®

VariMill II™ ER • Series 57NE • Metric







● first choice
○ alternate choice

P		○
M		○
K		
N		
S		●
H		●

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	SS	WS15PE
57NE10004T	10,0	10	9,40	22,00	30,00	76	–	–	**5599122**
57NE10024T	10,0	10	9,40	22,00	30,00	76	0,50	–	**5599123**
57NE10024W	10,0	10	9,40	22,00	30,00	76	0,50	W	**5599124**
57NE10034T	10,0	10	9,40	22,00	30,00	76	1,00	–	**5599125**
57NE10034W	10,0	10	9,40	22,00	30,00	76	1,00	W	**5599126**
57NE10054T	10,0	10	9,40	22,00	30,00	76	2,00	–	**5599127**
57NE10054W	10,0	10	9,40	22,00	30,00	76	2,00	W	**5599128**
57NE12005V	12,0	12	11,28	26,00	36,00	83	–	V	**5599129**
57NE12025V	12,0	12	11,28	26,00	36,00	83	0,50	V	**5599130**
57NE12025W	12,0	12	11,28	26,00	36,00	83	0,50	W	**5599131**
57NE12035V	12,0	12	11,28	26,00	36,00	83	1,00	V	**5599132**
57NE12035W	12,0	12	11,28	26,00	36,00	83	1,00	W	**5599133**
57NE12055V	12,0	12	11,28	26,00	36,00	83	2,00	V	**5599134**
57NE12055W	12,0	12	11,28	26,00	36,00	83	2,00	W	**5599135**
57NE16006V	16,0	16	15,04	32,00	48,00	100	–	V	**5599136**
57NE16026V	16,0	16	15,04	32,00	48,00	100	0,50	V	**5599137**
57NE16026W	16,0	16	15,04	32,00	48,00	100	0,50	W	**5599138**
57NE16036V	16,0	16	15,04	32,00	48,00	100	1,00	V	**5599139**
57NE16036W	16,0	16	15,04	32,00	48,00	100	1,00	W	**5599140**
57NE16056V	16,0	16	15,04	32,00	48,00	100	2,00	V	**5599141**
57NE16056W	16,0	16	15,04	32,00	48,00	100	2,00	W	**5599142**
57NE20007V	20,0	20	18,80	38,00	60,00	115	–	V	**5599143**
57NE20027W	20,0	20	18,80	38,00	60,00	115	0,50	W	**5599145**
57NE20037V	20,0	20	18,80	38,00	60,00	115	1,00	V	**5599146**
57NE20057V	20,0	20	18,80	38,00	60,00	115	2,00	V	**5599148**
57NE20087V	20,0	20	18,80	38,00	60,00	115	4,00	V	**5599160**
57NE20087W	20,0	20	18,80	38,00	60,00	115	4,00	W	**5599161**
57NE25038V	25,0	25	23,50	45,00	75,00	135	1,00	V	**5599165**

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V= Safe-Lock™

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Application Data • VariMill II™ • Series 5718 • Metric





Material Group		Side Milling (A)		AlTiN			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min			D1 — Diameter								
		ap	ae	min		max	mm	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	Ap1 max	0,05 x D*	300	–	400	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	1	Ap1 max	0,05 x D*	300	–	400	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	2	Ap1 max	0,05 x D*	280	–	380	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	3	Ap1 max	0,05 x D*	240	–	320	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	4	Ap1 max	0,05 x D*	180	–	300	fz	0,039	0,054	0,065	0,075	0,084	0,092	0,099	0,106	0,117
	5	Ap1 max	0,05 x D*	120	–	200	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
	6	Ap1 max	0,05 x D*	100	–	150	fz	0,030	0,040	0,048	0,056	0,062	0,068	0,073	0,078	0,085
M	1	Ap1 max	0,05 x D*	180	–	230	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	2	Ap1 max	0,05 x D*	120	–	160	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
	3	Ap1 max	0,05 x D*	120	–	140	fz	0,030	0,040	0,048	0,056	0,062	0,068	0,073	0,078	0,085
K	1	Ap1 max	0,05 x D*	240	–	300	fz	0,053	0,072	0,086	0,099	0,111	0,121	0,130	0,137	0,149
	2	Ap1 max	0,05 x D*	220	–	280	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	3	Ap1 max	0,05 x D*	220	–	260	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
S	1	Ap1 max	0,05 x D*	100	–	180	fz	0,044	0,060	0,073	0,084	0,095	0,105	0,113	0,121	0,137
	2	Ap1 max	0,05 x D*	50	–	80	fz	0,023	0,032	0,038	0,045	0,050	0,056	0,060	0,065	0,074
	3	Ap1 max	0,05 x D*	120	–	160	fz	0,035	0,048	0,058	0,067	0,076	0,084	0,091	0,097	0,109
	4	Ap1 max	0,05 x D*	100	–	120	fz	0,031	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
H	1	Ap1 max	0,05 x D*	160	–	280	fz	0,039	0,054	0,065	0,075	0,084	0,092	0,099	0,106	0,117
	2	Ap1 max	0,06 x D*	140	–	240	fz	0,030	0,040	0,048	0,056	0,062	0,068	0,073	0,078	0,085

** For the above cutting data, do not exceed an overall ae of 0,8mm.*

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machinining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • VariMill II • Series 57N8 • Metric







Material Group		Side Milling (A) and Slotting (B)			WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.						
		A		B	Cutting Speed — vc m/min			D1 — Diameter						
		ap	ae	ap	min		max	mm	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,036	0,050	0,061	0,007	0,087	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters >12mm diameters.

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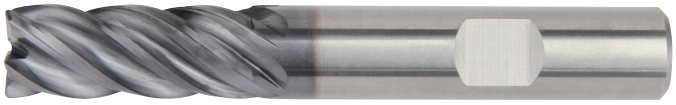


Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	100	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,077	0,088	0,098

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on > 12mm diameters.

Application Data • VariMill II • Series 577C • Metric



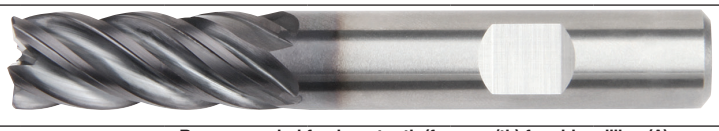


Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,3 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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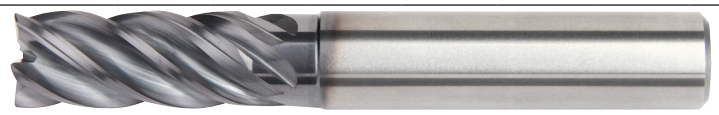
Application Data • VariMill II™ ER • Series 577E • Metric



Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 10,0	12,0	16,0	18,0	20,0	25,0
P	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,048	0,056	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,040	0,047	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,061	0,070	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,040	0,047	0,057	0,061	0,065	0,071
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,061	0,070	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,032	0,037	0,046	0,050	0,054	0,061
	3	1,5 x D	0,3 x D	1 x D	25	–	40	fz	0,048	0,056	0,070	0,076	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,045	0,052	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,054	0,062	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,040	0,047	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • VariMill II • Series 57NC • Metric

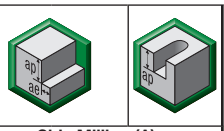


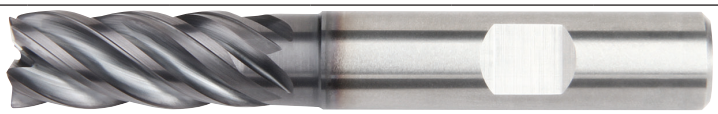
Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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Material Group		Side Milling (A) and Slotting (B)			WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.					
		A		B	Cutting Speed — vc m/min				D1 — Diameter				
		ap	ae	ap	min		max	mm	10,0	12,0	16,0	18,0	20,0	25,0
P	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,048	0,056	0,070	0,076	0,081	0,091
	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,040	0,047	0,057	0,061	0,065	0,071
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,061	0,070	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,040	0,047	0,057	0,061	0,065	0,071
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,061	0,070	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	50	fz	0,032	0,037	0,046	0,050	0,054	0,061
	3	1,5 x D	0,3 x D	1 x D	40	–	90	fz	0,048	0,056	0,070	0,076	0,081	0,091
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,045	0,052	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,054	0,062	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,040	0,047	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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VariMill III™ ER

High-Performance Solid Carbide End Mills

Seven unequally spaced flutes to increase productivity using high-speed machining techniques such as trochoidal and peel milling.

Materials:

P M S H



Innovative core design
Superior wall straightness.

Available with common aerospace radii.

2 x D (necked), 3 x D, and 5 x D standard.

Central Coolant Hole
(2 x D with neck only.)

Available with SAFE-λOCK® shanks.

Victory™ Grade WS15PE™
Market-leading surface technology using pre- and post-coat treatments.

7-Flute Design
Superior finishes specially suited for high-speed machining.

Eccentric Relief Grind
Consistent edge quality.



77NE Series

- Titanium and stainless steel geometry design.
- Corner radii.
- 2 x D length of cut.
- Necked 5 x D reach.
- Non-centre cutting.



772E Series

- Titanium and stainless steel geometry design.
- Corner radii.
- 5 x D length of cut.
- Centre cutting.
- SAFE-λOCK®.

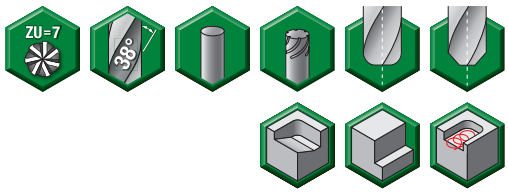


771E Series

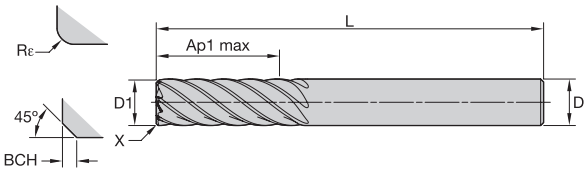
- Titanium and stainless steel geometry design.
- Corner radii.
- 3 x D length of cut.
- Centre cutting.
- SAFE-λOCK®.

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B27–B30.

VariMill III™ ER • Series 771E 772E • Metric







● first choice
○ alternate choice

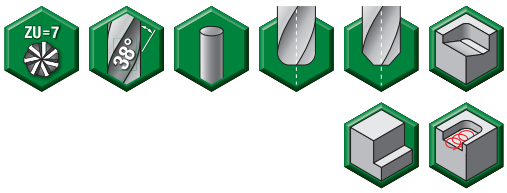
P		○
M		○
K		
N		
S		●
H		○

catalogue number	D1	D	length of cut Ap1 max	length L	Rε	BCH	SS	WS15PE
771E10004T	10,0	10	30,00	76	–	0,50	–	**5978092**
771E10024T	10,0	10	30,00	76	0,50	–	–	**5978093**
772E10004T	10,0	10	50,00	100	–	0,50	–	**5978094**
772E10024T	10,0	10	50,00	100	0,50	–	–	**5978095**
771E12005T	12,0	12	36,00	100	–	0,50	–	**5978098**
771E12025T	12,0	12	36,00	100	0,50	–	–	**5978099**
772E12005T	12,0	12	60,00	125	–	0,50	–	**5978100**
772E12005V	12,0	12	60,00	125	–	0,50	V	**5978102**
772E12025T	12,0	12	60,00	125	0,50	–	–	**5978101**
772E12025V	12,0	12	60,00	125	0,50	–	V	**5978103**
771E16006T	16,0	16	48,00	110	–	0,50	–	**5978106**
771E16026T	16,0	16	48,00	110	0,50	–	–	**5978107**
772E16006T	16,0	16	80,00	141	–	0,50	–	**5978108**
772E16006V	16,0	16	80,00	141	–	0,50	V	**5978110**
772E16026T	16,0	16	80,00	141	0,50	–	–	**5978109**
772E16026V	16,0	16	80,00	141	0,50	–	V	**5978111**
771E20007T	20,0	20	60,00	125	–	0,50	–	**5978114**
771E20027T	20,0	20	60,00	125	0,50	–	–	**5978115**
772E20007T	20,0	20	100,00	166	–	0,50	–	**5978116**
772E20027T	20,0	20	100,00	166	0,50	–	–	**5978117**

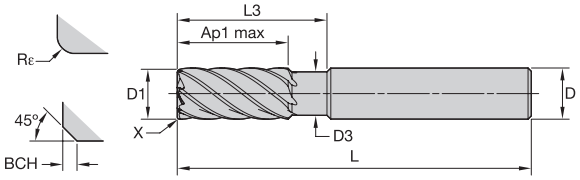
NOTE: SS = Shank Style
V= Safe-Lock™

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

VariMill III™ ER • Series 77NE • Metric







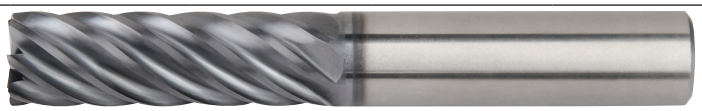
● first choice
○ alternate choice

P		○
M		○
K		
N		
S		●
H		○

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	BCH	WS15PE
77NE10004T	10,0	10	9,40	22,00	30,00	76	–	0,50	**5978039**
77NE10024T	10,0	10	9,40	22,00	30,00	76	0,50	–	**5978040**
77NE12005T	12,0	12	11,28	26,00	36,00	83	–	0,50	**5978096**
77NE12025T	12,0	12	11,28	26,00	36,00	83	0,50	–	**5978097**
77NE16006T	16,0	16	15,04	32,00	48,00	100	–	0,50	**5978104**
77NE16026T	16,0	16	15,04	32,00	48,00	100	0,50	–	**5978105**
77NE20007T	20,0	20	18,80	38,00	60,00	115	–	0,50	**5978112**
77NE20027T	20,0	20	18,80	38,00	60,00	115	0,50	–	**5978113**

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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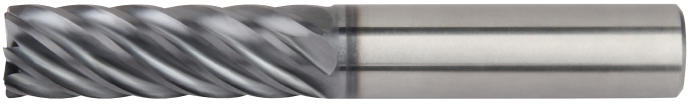
Application Data • VariMill III™ ER • Series 771E • Metric



Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).				
		A		Cutting Speed — vc m/min				D1 — Diameter			
		ap	ae	min		max	mm	10,0	12,0	16,0	18,0	20,0
P	4	3 x D	0,2 x D	90	–	150	fz	0,054	0,062	0,077	0,083	0,088
	5	3 x D	0,2 x D	60	–	100	fz	0,048	0,056	0,070	0,076	0,081
M	1	3 x D	0,2 x D	90	–	115	fz	0,061	0,070	0,087	0,095	0,101
	2	3 x D	0,2 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081
	3	3 x D	0,2 x D	60	–	70	fz	0,040	0,047	0,057	0,061	0,065
S	1	3 x D	0,2 x D	50	–	90	fz	0,061	0,070	0,087	0,095	0,101
	2	3 x D	0,2 x D	25	–	40	fz	0,032	0,037	0,046	0,050	0,054
	3	3 x D	0,2 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081
	4	3 x D	0,2 x D	50	–	60	fz	0,045	0,052	0,064	0,069	0,074
H	1	3 x D	0,2 x D	80	–	140	fz	0,054	0,062	0,077	0,083	0,088
	2	3 x D	0,2 x D	70	–	120	fz	0,040	0,047	0,057	0,061	0,065

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • VariMill III ER • Series 772E • Metric



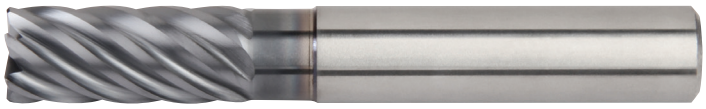
Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).				
		A		Cutting Speed — vc m/min				D1 — Diameter			
		ap	ae	min		max	mm	10,0	12,0	16,0	18,0	20,0
P	0	5 x D	0,05 x D	300	–	400	fz	0,086	0,099	0,121	0,130	0,137
	1	5 x D	0,05 x D	300	–	400	fz	0,086	0,099	0,121	0,130	0,137
	2	5 x D	0,05 x D	280	–	380	fz	0,086	0,099	0,121	0,130	0,137
	3	5 x D	0,05 x D	240	–	320	fz	0,073	0,084	0,105	0,113	0,121
	4	5 x D	0,05 x D	180	–	300	fz	0,065	0,075	0,092	0,099	0,106
	5	5 x D	0,05 x D	120	–	200	fz	0,058	0,067	0,084	0,091	0,097
	6	5 x D	0,05 x D	100	–	150	fz	0,048	0,056	0,068	0,073	0,078
M	1	5 x D	0,05 x D	180	–	230	fz	0,073	0,084	0,105	0,113	0,121
	2	5 x D	0,05 x D	120	–	160	fz	0,058	0,067	0,084	0,091	0,097
	3	5 x D	0,05 x D	120	–	140	fz	0,048	0,056	0,068	0,073	0,078
K	1	5 x D	0,05 x D	240	–	300	fz	0,086	0,099	0,121	0,130	0,137
	2	5 x D	0,05 x D	220	–	280	fz	0,073	0,084	0,105	0,113	0,121
	3	5 x D	0,05 x D	220	–	260	fz	0,058	0,067	0,084	0,091	0,097
S	1	5 x D	0,05 x D	100	–	180	fz	0,073	0,084	0,105	0,113	0,121
	2	5 x D	0,05 x D	50	–	80	fz	0,038	0,045	0,056	0,060	0,065
	3	5 x D	0,05 x D	120	–	160	fz	0,058	0,067	0,084	0,091	0,097
	4	5 x D	0,05 x D	100	–	120	fz	0,053	0,062	0,077	0,083	0,089
H	1	5 x D	0,05 x D	160	–	280	fz	0,065	0,075	0,092	0,099	0,106
	2	5x D	0,06 x D	140	–	240	fz	0,048	0,056	0,068	0,073	0,078

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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Application Data • VariMill III™ ER • Series 77NE • Semi-Finishing • Metric

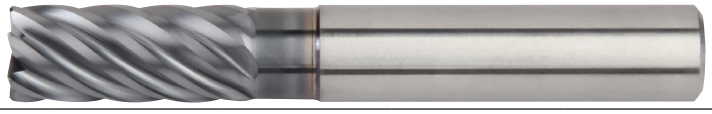




Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).				
		A		Cutting Speed — vc m/min				D1 — Diameter			
		ap	ae	min		max	mm	10,0	12,0	16,0	18,0	20,0
P	4	1,5 x D	0,3 x D	90	–	150	fz	0,054	0,062	0,077	0,083	0,088
	5	1,5 x D	0,3 x D	60	–	100	fz	0,048	0,056	0,070	0,076	0,081
M	1	1,5 x D	0,3 x D	90	–	115	fz	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081
	3	1,5 x D	0,3 x D	60	–	70	fz	0,040	0,047	0,057	0,061	0,065
S	1	1,5 x D	0,3 x D	50	–	90	fz	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	25	–	40	fz	0,032	0,037	0,046	0,050	0,054
	3	1,5 x D	0,3 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081
	4	1,5 x D	0,3 x D	50	–	60	fz	0,045	0,052	0,064	0,069	0,074
H	1	1,5 x D	0,3 x D	80	–	140	fz	0,054	0,062	0,077	0,083	0,088
	2	1,5 x D	0,3 x D	70	–	120	fz	0,040	0,047	0,057	0,061	0,065

Application Data • VariMill III ER • Series 77NE • Finishing • Metric



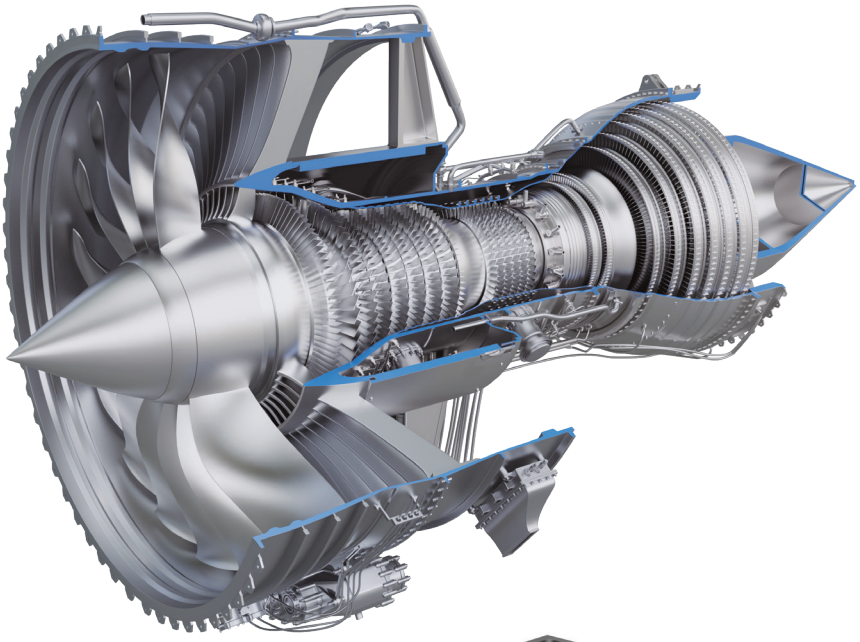


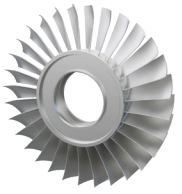
Material Group		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).				
		A		Cutting Speed — vc m/min				D1 — Diameter			
		ap	ae	min		max	mm	10,0	12,0	16,0	18,0	20,0
P	4	Ap1 max	0,06 x D	180	–	300	fz	0,065	0,075	0,092	0,099	0,106
	5	Ap1 max	0,06 x D	120	–	200	fz	0,058	0,067	0,084	0,091	0,097
M	1	Ap1 max	0,06 x D	180	–	230	fz	0,073	0,084	0,105	0,113	0,121
	2	Ap1 max	0,06 x D	120	–	160	fz	0,058	0,067	0,084	0,091	0,097
	3	Ap1 max	0,06 x D	120	–	140	fz	0,048	0,056	0,068	0,073	0,078
S	1	Ap1 max	0,06 x D	100	–	180	fz	0,073	0,084	0,105	0,113	0,121
	2	Ap1 max	0,06 x D	50	–	80	fz	0,038	0,045	0,056	0,060	0,065
	3	Ap1 max	0,06 x D	120	–	160	fz	0,058	0,067	0,084	0,091	0,097
	4	Ap1 max	0,06 x D	100	–	120	fz	0,053	0,062	0,077	0,083	0,089
H	1	Ap1 max	0,06 x D	160	–	280	fz	0,065	0,075	0,092	0,099	0,106
	2	Ap1 max	0,06 x D	140	–	240	fz	0,048	0,056	0,068	0,073	0,078

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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Engine Components





Integral Blade Rotor
(IBR)



Single Blade



Bracket



Depressor
Fine Seal

AEROSPACE

WIDIA™ Offers Machining Strategies and Innovative Tooling Technology that Reduces Cycle Time and Increases Cost Savings.

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Victory™ X-Feed™

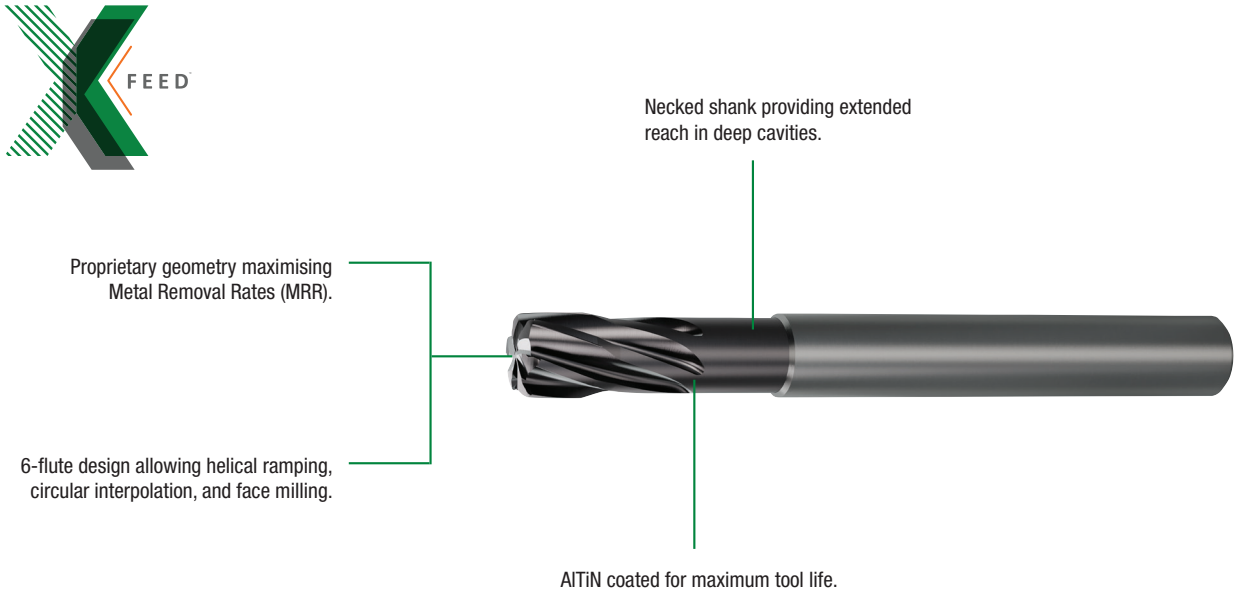
High-Performance Solid Carbide End Mills

X-Feed end mills significantly reduce manufacturing time due to having more effective cutting edges than a regular solid carbide tool. The extended reach design and neck are perfectly suited for pocketing using 3D machining techniques such as ramping and helical interpolation. During face milling, the proprietary front-end geometry of X-feed end mills are in full contact with the workpiece, providing up to 55% engagement compared to the regular 5–10% provided by ball nose-type tooling.

Materials:

M S H

- Covering hardened materials ranging from 37–67HRC, stainless steels, and high-temp alloys.
- One tool for roughing and finishing.
- Proprietary 6-flute design for high productivity.
- 3 x D neck.



Larger Radial Engagement vs. Standard Ball Nose End Mills.



5–10%
Radial engagement



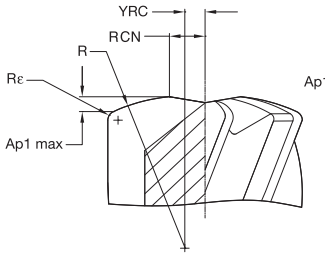
55%
Radial engagement

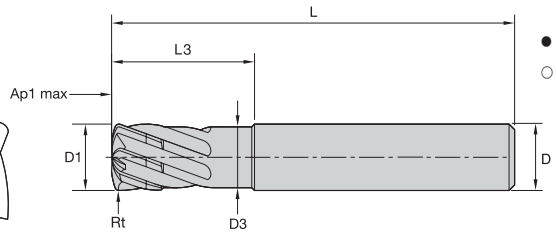
FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B33–B35.

Series 70N7 • Hard Materials • Metric









● first choice
○ alternate choice

P	
M	
K	
N	
S	
H	●

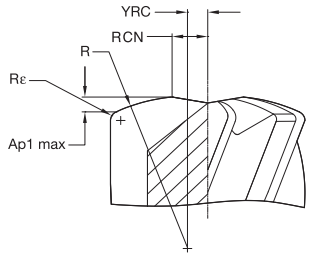
catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	Rt	ALTIN-MT1
70N706002MT	6,0	6	5,50	0,20	18,00	63	0,38	0,58	**3484756**
70N710004MT	10,0	10	9,00	0,33	30,00	89	0,63	0,96	**3484758**

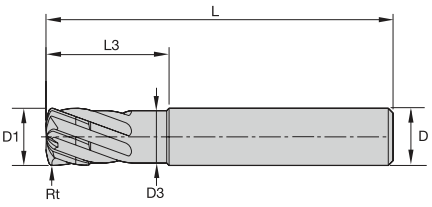
NOTE: YRC = distance from centre line to the crown of the R radius.
RCN = distance from centre line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
R = the head radius size.
Rε = the shoulder radius or radius at the corner of the cutter.

Series 70NS • Stainless Steel/High-Temp • Metric









● first choice
○ alternate choice

P	
M	●
K	
N	
S	●
H	

catalogue number	D1	D	D3	L3	length L	Rε	Rt	AlTiN-MT
70NS06002	6,0	6	5,50	17,75	63	0,38	0,67	**6441882**
70NS08003	8,0	8	7,50	23,75	76	0,50	0,89	**6441883**
70NS10004	10,0	10	9,00	29,50	89	0,63	1,12	**6441884**
70NS12005	12,0	12	11,00	35,50	100	0,75	1,34	**6441885**
70NS16006	16,0	16	15,00	47,50	110	1,00	1,79	**6441886**
70NS20007	20,0	20	19,00	59,50	125	1,25	2,23	**6441887**

NOTE: YRC = distance from centre line to the crown of the R radius.
RCN = distance from centre line to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
R = the head radius size.
Rε = the shoulder radius or radius at the corner of the cutter.

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

Application Data • Series 70N7 • Hard Materials • Metric





Material Group		Profile Milling		AlTiN			Recommended Feed Per Tooth (fz = mm/th) for 3D milling/profiling (A)						
		A		Cutting Speed — vc m/min				D1 — Diameter					
		ap	ae	min		max	mm	6,0	8,0	10,0	12,0	16,0	20,0
H	2	0,03 x D	0,55 x D	100	–	120	fz	0,200	0,300	0,300	0,400	0,500	0,600
	3	0,03 x D	0,55 x D	80	–	100	fz	0,200	0,300	0,300	0,400	0,500	0,600
	4	0,03 x D	0,55 x D	50	–	70	fz	0,150	0,200	0,250	0,300	0,400	0,500

Tool List 70N7

Geometrical Parameters									Ramping Guide for Circular and Linear Interpolation						
									Circular Interpolation		Linear Interpolation				
									Allowed Range of Hole Diameter		Calculated Length (mm) per Ramp Angle				
diameter	Ap1 max	Rfm	Rt	Rc	Xfm	Yfm	YD	Number			Ramp Angle (degree)				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	flutes	Smallest	Largest	1	2	3	4	5
6	0,20	9	0,58	0,375	0,20	0,75	1,26	6	8,52	12	11,51	5,75	3,83	2,87	2,30
8	0,27	12	0,77	0,500	0,27	1,00	1,68	6	11,36	16	15,34	7,67	5,11	3,83	3,06
10	0,33	15	0,96	0,625	0,33	1,25	2,10	6	14,2	20	19,18	9,58	6,39	4,79	3,83
12	0,40	18	1,15	0,750	0,40	1,50	2,52	6	17,04	24	23,01	11,50	7,66	5,74	4,59
16	0,54	24	1,54	1,000	0,54	2,00	3,36	6	22,72	32	30,68	15,34	10,22	7,66	6,12
20	0,67	30	1,92	1,250	0,67	2,50	4,20	6	28,4	40	38,35	19,17	12,77	9,57	7,65
Recommended Feed											100%	70%	50%	30%	10%

NOTE: Above parametres are based on ideal conditions. For smaller taper machining centres, please adjust parametres accordingly on diameters >12mm.

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Application Data • Series 70NS • Stainless Steel/High-Temp • Metric

Material Group		Profile Milling		AlTiN-MT			Recommended Feed Per Tooth (fz = mm/th) for 3D milling/profiling (A)						
		A		Cutting Speed — Vc m/min				D1 — Diameter					
		ap	ae	min		max	mm	6,0	8,0	10,0	12,0	16,0	20,0	25,0
M	1	0.5 x D	0.55 x D	90	–	115	fz	0,300	0,400	0,500	0,540	0,720	0,900	1,125
	2	0.5 x D	0.55 x D	60	–	80	fz	0,240	0,320	0,400	0,480	0,640	0,800	1,000
	3	0.5 x D	0.55 x D	60	–	70	fz	0,240	0,320	0,400	0,480	0,640	0,800	1,000
S	1	0.5 x D	0.55 x D	50	–	90	fz	0,270	0,360	0,450	0,500	0,650	0,800	1,000
	2	0.5 x D	0.55 x D	50	–	80	fz	0,240	0,320	0,400	0,480	0,600	0,700	0,900
	3	0.5 x D	0.55 x D	25	–	40	fz	0,180	0,240	0,300	0,350	0,430	0,500	0,600
	4	0.5 x D	0.55 x D	50	–	60	fz	0,210	0,280	0,350	0,420	0,560	0,700	0,875

70NS Metric															
Geometrical Parameters									Ramping Guide for Circular and Linear Interpolation						
									Circular Interpolation		Linear Interpolation				
									Allowed Range of Hole Diameter		Calculated Length (mm) per Ramp Angle				
diameter	Ap1 max	Rfm	Rt	Rc	Xfm	Yfm	YD	Number			Ramp Angle (degree)				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	flutes	Smallest	Largest	1	2	3	4	5
6	0,32	6	0,67	0,375	0,338	0,75	1,26	6	8,52	12	18,12	9,06	6,03	4,52	3,61
8	0,42	8	0,89	0,500	0,450	1,00	1,68	6	11,36	16	24,16	12,08	8,05	6,03	4,82
10	0,53	10	1,12	0,625	0,562	1,25	2,10	6	14,2	20	30,20	15,09	10,06	7,54	6,02
12	0,63	12	1,34	0,750	0,674	1,50	2,52	6	17,04	24	36,24	18,11	12,07	9,05	7,23
16	0,84	16	1,79	1,000	0,915	2,00	3,36	6	22,72	32	48,31	24,15	16,09	12,06	9,64
20	1,05	20	2,23	1,250	1,124	2,50	4,20	6	28,4	40	60,39	30,19	20,11	15,08	12,05
25	1,25	25	2,90	1,5625	1,405	3,1250	5,25	6	35,5	50	70,61	35,80	23,85	17,88	14,29
Recommended Feed											30%	30%	30%	30%	10%

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters greater than 12mm.

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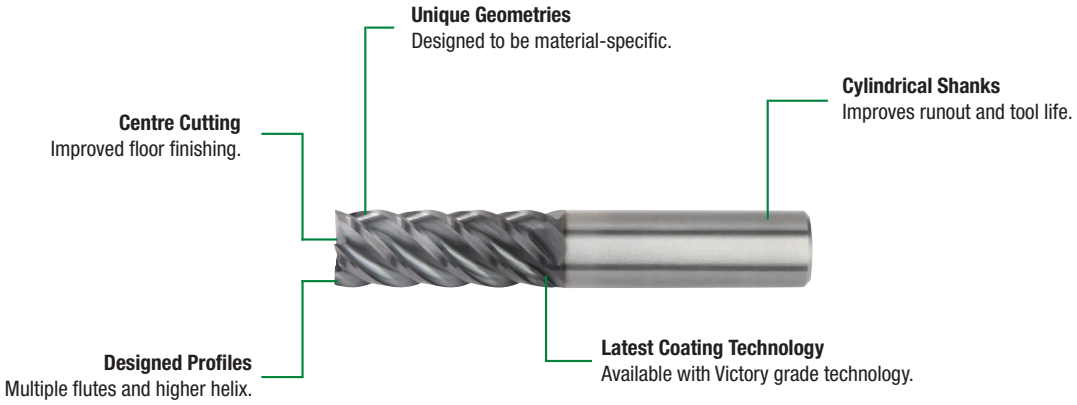
HP Finishers

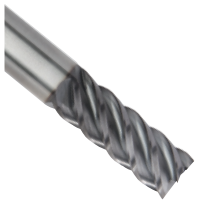
High-Performance Solid Carbide End Mills • Finishing

Specific geometries, with the latest coating technology, including Victory™ grades, targeted for steels, stainless steels, high-temperature alloys, and titanium.

Materials:

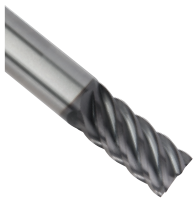
P M K S H





D503/4503 Series

- Centre cutting.
- High helix.
- Works in a variety of workpiece materials.
- 3-Flute

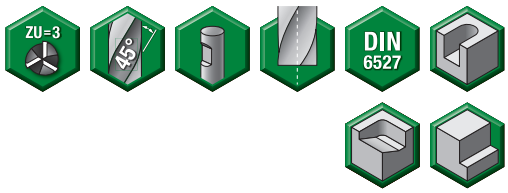


D507/D517 Series

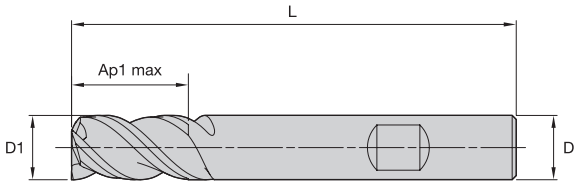
- Centre cutting.
- 6 flute.
- High helix.
- Use for super finishing in multiple workpiece materials.

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B37–B40.

Series D513 • Metric





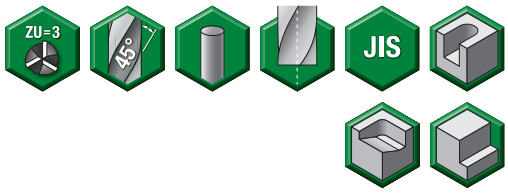


● first choice
○ alternate choice

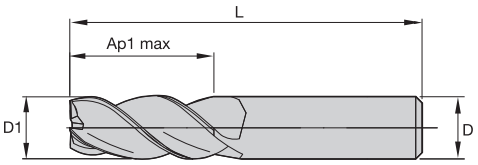
P	●
M	●
K	●
N	
S	●
H	●

catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
D51303002RW	3,0	6	7,00	57	**1661680**

Series 4503 JJ • Metric







● first choice
○ alternate choice

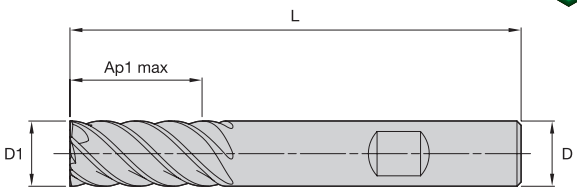
P	●
M	●
K	○
N	
S	○
H	○

catalogue number	D1	D	length of cut Ap1 max	length L	WP15PE
450301001T	1,0	4	3,00	50	**5559170**
450301501T	1,5	4	3,00	50	**5559171**
450302001T	2,0	4	3,00	50	**5559172**
450303002T	3,0	6	8,00	50	**5559175**
450304002T	4,0	6	12,00	50	**5559177**
450304502T	4,5	6	14,00	50	**5559178**
450306002T	6,0	6	16,00	50	**5559180**

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FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

Series D507 D517 • Metric





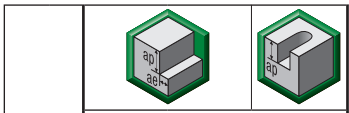
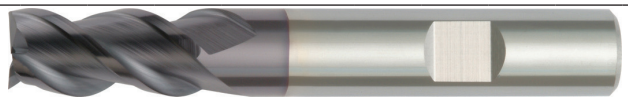
● first choice
○ alternate choice

P		●
M		●
K		○
N		
S		○
H		●

catalogue number	D1	D	length of cut Ap1 max	length L	WP15PE
D50706002W	6,0	6	10,00	54	**5559100**
D51706002W	6,0	6	13,00	57	**5559108**
D50708003W	8,0	8	12,00	58	**5559101**
D51708003W	8,0	8	19,00	63	**5559109**
D50710004W	10,0	10	14,00	66	**5559102**
D51710004W	10,0	10	22,00	72	**5559110**
D50712005W	12,0	12	16,00	73	**5559103**
D51712005W	12,0	12	26,00	83	**5559111**
D50716006W	16,0	16	22,00	82	**5559105**
D51716006W	16,0	16	32,00	92	**5559113**

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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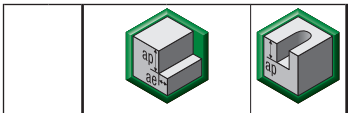
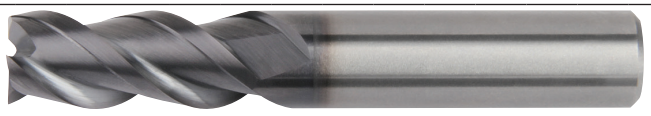
Application Data • Series D513 • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	TiAlN Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,25 x D	0,2 x D	0,25 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,25 x D	0,2 x D	0,25 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,2 x D	0,25 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,25 x D	0,2 x D	0,25 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,25 x D	0,2 x D	0,25 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,25 x D	0,2 x D	0,25 x D	60	–	100	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1,25 x D	0,2 x D	0,25 x D	50	–	75	fz	0,008	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1,25 x D	0,2 x D	0,25 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,2 x D	0,25 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,25 x D	0,2 x D	0,25 x D	60	–	70	fz	0,008	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1,25 x D	0,2 x D	0,25 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,2 x D	0,25 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,25 x D	0,2 x D	0,25 x D	110	–	130	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1,25 x D	0,2 x D	0,25 x D	50	–	90	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,2 x D	0,25 x D	25	–	40	fz	0,006	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,25 x D	0,2 x D	0,25 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	4	1,25 x D	0,2 x D	0,25 x D	50	–	60	fz	0,007	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1,25 x D	0,2 x D	0,25 x D	80	–	140	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • Series 4503 JJ • Metric

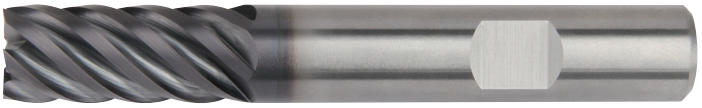



Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0
P	0	1,5 x D	0,3 x D	0,5 x D	150	–	200	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	1	1,5 x D	0,3 x D	0,5 x D	150	–	200	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	2	1,5 x D	0,3 x D	0,5 x D	140	–	190	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	3	1,5 x D	0,3 x D	0,5 x D	120	–	160	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	4	1,5 x D	0,3 x D	0,3 x D	90	–	150	fz	0,005	0,008	0,010	0,013	0,016	0,019	0,021	0,024	0,027	0,033	0,045	0,054	0,062	0,077	0,083	0,088
	5	1,5 x D	0,3 x D	0,5 x D	60	–	100	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
	6	1,5 x D	0,3 x D	0,3 x D	50	–	75	fz	0,004	0,006	0,008	0,010	0,012	0,014	0,016	0,018	0,020	0,025	0,034	0,040	0,047	0,057	0,061	0,065
M	1	1,5 x D	0,3 x D	0,5 x D	90	–	115	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	0,5 x D	60	–	80	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
	3	1,5 x D	0,3 x D	0,5 x D	60	–	70	fz	0,004	0,006	0,008	0,010	0,012	0,014	0,016	0,018	0,020	0,025	0,034	0,040	0,047	0,057	0,061	0,065
K	1	1,5 x D	0,3 x D	0,5 x D	120	–	150	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	2	1,5 x D	0,3 x D	0,5 x D	110	–	140	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	3	1,5 x D	0,3 x D	0,5 x D	110	–	130	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,003	0,005	0,006	0,008	0,009	0,011	0,013	0,014	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054
	3	1,5 x D	0,3 x D	0,5 x D	60	–	80	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
	4	1,5 x D	0,3 x D	0,5 x D	50	–	60	fz	0,003	0,005	0,007	0,009	0,011	0,014	0,016	0,018	0,021	0,026	0,037	0,045	0,052	0,064	0,069	0,074
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,005	0,008	0,010	0,013	0,016	0,019	0,021	0,024	0,027	0,033	0,045	0,054	0,062	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
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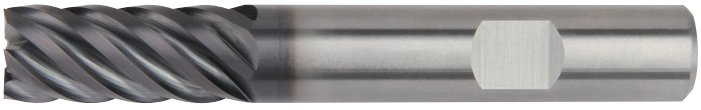
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Application Data • Series D507 • Metric

Material Group		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min			D1 — Diameter								
		ap	ae	min		max	mm	4,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,0 x D	0,2 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,0 x D	0,2 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,0 x D	0,2 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,0 x D	0,1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,0 x D	0,1 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,0 x D	0,1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1,0 x D	0,1 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1,0 x D	0,1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,0 x D	0,1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1,0 x D	0,1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1,0 x D	0,1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,0 x D	0,1 x D	110	–	140	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1,0 x D	0,1 x D	110	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1,0 x D	0,1 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,0 x D	0,1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,0 x D	0,15 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	4	1,0 x D	0,15 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1,0 x D	0,1 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

Application Data • Series D517 • Metric

Material Group		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).								
		A		Cutting Speed — vc m/min			D1 — Diameter								
		ap	ae	min		max	mm	4,0	6,0	0,040	10,0	12,0	14,0	0,070	18,0	20,0
P	0	Ap1 max	0,2 x D	150	–	200	fz	0,028	0,044	0,037	0,072	0,083	0,092	0,064	0,108	0,114
	1	Ap1 max	0,2 x D	150	–	200	fz	0,028	0,044	0,045	0,072	0,083	0,092	0,077	0,108	0,114
	2	Ap1 max	0,2 x D	140	–	190	fz	0,028	0,044	16,0	0,072	0,083	0,092	–	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,023	0,036	0,101	0,061	0,070	0,079	–	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,021	0,033	0,101	0,054	0,062	0,070	–	0,083	0,088
	5	Ap1 max	0,1 x D	60	–	100	fz	0,019	0,029	0,101	0,048	0,056	0,063	–	0,076	0,081
	6	Ap1 max	0,1 x D	50	–	75	fz	0,016	0,025	0,087	0,040	0,047	0,052	–	0,061	0,065
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,023	0,036	0,077	0,061	0,070	0,079	–	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,019	0,029	0,070	0,048	0,056	0,063	–	0,076	0,081
	3	Ap1 max	0,1 x D	60	–	70	fz	0,016	0,025	0,057	0,040	0,047	0,052	–	0,061	0,065
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,028	0,044	0,087	0,072	0,083	0,092	–	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,023	0,036	0,070	0,061	0,070	0,079	–	0,095	0,101
	3	Ap1 max	0,1 x D	110	–	130	fz	0,019	0,029	0,057	0,048	0,056	0,063	–	0,076	0,081
S	1	Ap1 max	0,1 x D	50	–	90	fz	0,023	0,036	0,101	0,061	0,070	0,079	–	0,095	0,101
	2	Ap1 max	0,1 x D	25	–	40	fz	0,013	0,019	0,087	0,032	0,037	0,042	–	0,050	0,054
	3	Ap1 max	0,15 x D	60	–	80	fz	0,019	0,029	0,070	0,048	0,056	0,063	–	0,076	0,081
	4	Ap1 max	0,15 x D	50	–	60	fz	0,016	0,026	0,087	0,045	0,052	0,058	–	0,069	0,074
H	1	Ap1 max	0,1 x D	80	–	140	fz	0,021	0,033	0,046	0,054	0,062	0,070	–	0,083	0,088

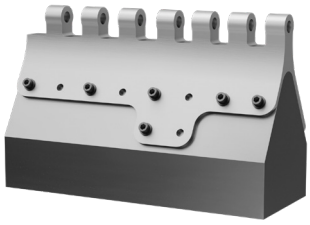
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters >12mm.

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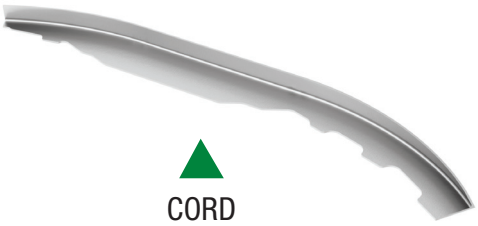
Structure

AEROSPACE

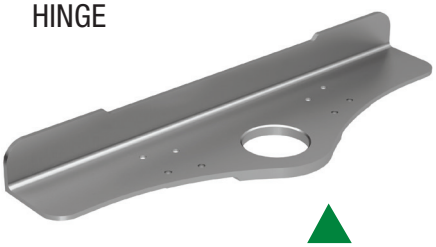
WIDIA™ offers machining strategies and advanced tooling solutions to machine aerospace components like the ones seen below.



HINGE



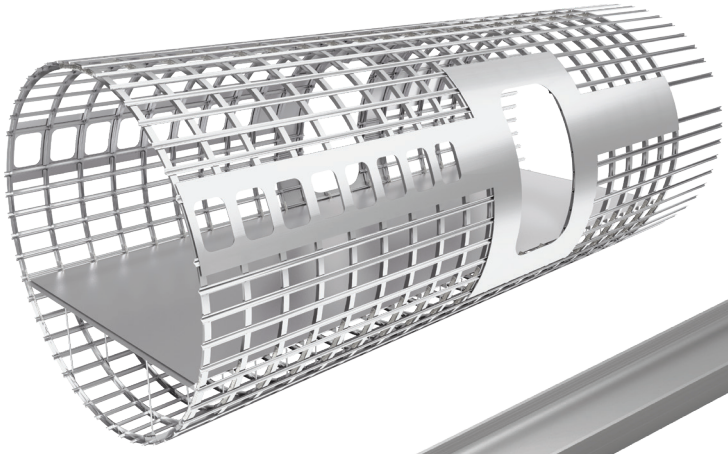
CORD



FITTING PIVOT



NOSE SECTION FUSELAGE





FLOOR BEAM



FLOOR BEAM FITTING

TO SEE ALL PRODUCT LINES, VISIT OUR DIGITAL RESOURCES

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HP Rougher

High-Performance Solid Carbide End Mills • Roughing

Rougher Profiles

Finishing End Mill



Straight cutting edge
Ra = 0,5–0,8
Rz = 4–6
Lower power
Higher feed speed

Flat Shallow Profile Rougher



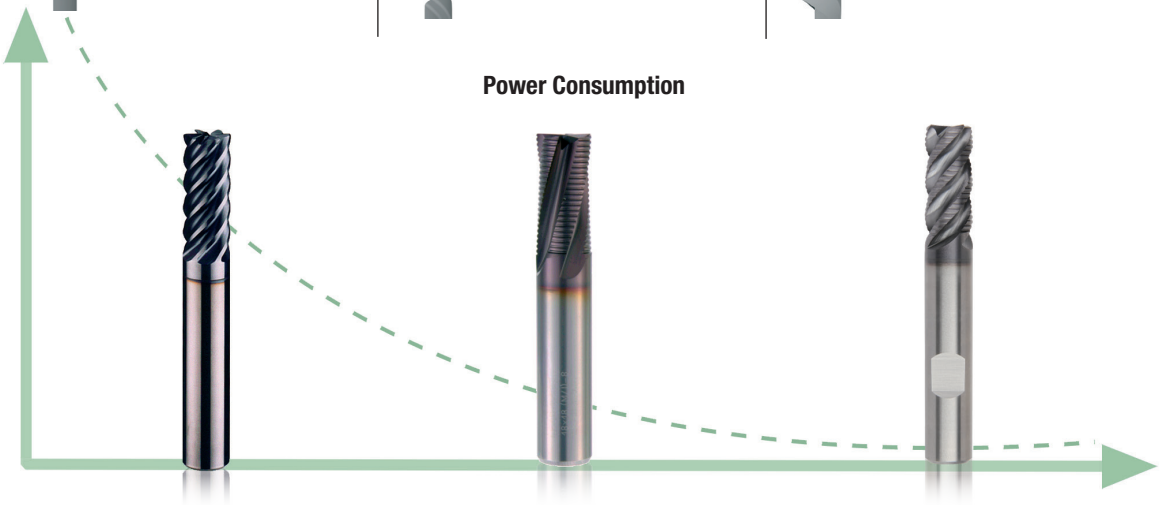
Flat profile
Ra = 2,5–3,5
Rz = 20–25
Low power consumption
Higher feed speed, less sensitive to vibration, good wear resistance; good surface finish that is better than finisher tools.

Fine-Profile Rougher



Cord profile
Ra = 12–14
Rz = 90–110
Low power consumption
Higher feed speed, not sensitive to vibration, good wear resistance.

Power Consumption



Profile Name
Flat shallow profile

Application Area:

Wide product range to cover most applications in aerospace market segments. Mainly for hard steel and stainless steel and high-temperature alloys applications in profiling and slotting, very good chip evacuation and wear resistance. It will provide surface finish Ra 2.5-3.5 Rz 20 25.

Profile Name
Fine-profile rougher

Application Area:

Wide product range to cover most applications in general engineering, as well as aerospace market segments. Mainly for steel applications in profiling and slotting, provides less force on the part. It will provide Surface finish Ra 12-14 Rz 90-110.

Profile Name
Chipbreaker pitch

Application Area:

Wide product range to cover most applications in general engineering, as well as aerospace market segments. Mainly for steel and stainless steel applications in profiling and slotting, provides less force on the part. It will provide surface finish Ra 2.5-3.5 Rz 20 25.



DQ13

- Centre cutting.
- Chipbreaker profile.
- All ferrous workpiece materials.



4906

- Centre cutting.
- Fine profile.
- All ferrous workpiece materials.



4976/4U70 Series

- Centre cutting.
- Flat shallow profile.
- Steels, stainless steel, and high-temperature alloys.



4U50

- Shallow pitch rougher.
- 4–6 flutes with variable spacing.
- Short length of cut and 3 x D diameter neck length.
- Stainless steel and high-temp alloys.
- Centre cutting.



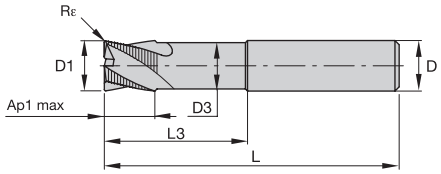
4U80

- Shallow pitch rougher.
- 4–6 flutes with variable spacing.
- Regular length of cut.
- Stainless steel and high-temp alloys.
- Centre cutting.

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B43–B50.

Series 4U50 • Metric





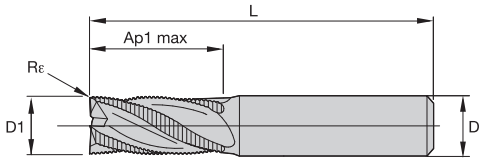
● first choice
○ alternate choice

P	
M	●
K	
N	
S	●
H	

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	Rε	ZU	WS15PE
4U50M080R3TC	8,0	8	7,52	8,00	24,00	63	0,30	4	6431404
4U50M100R4TE	10,0	10	9,40	10,00	30,00	72	0,50	4	6431405
4U50M120R5TE	12,0	12	11,28	12,00	36,00	83	0,50	4	6431406
4U50M160R6TE	16,0	16	15,04	16,00	48,00	92	0,50	6	6431407
4U50M200R7TG	20,0	20	18,80	20,00	60,00	104	1,00	6	6431408

Series 4U80 • Metric





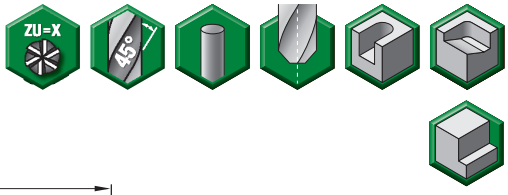
● first choice
○ alternate choice

P	
M	●
K	
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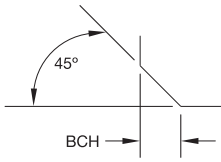
catalogue number	D1	D	length of cut Ap1 max	length L	Rε	ZU	WS15PE
4U80M060R2TC	6,0	6	13,00	57	0,30	4	6431246
4U80M080R3TC	8,0	8	16,00	63	0,30	4	6431247
4U80M100R4TE	10,0	10	22,00	72	0,50	4	6431248
4U80M120R5TE	12,0	12	26,00	83	0,50	4	6431249
4U80M160R6TE	16,0	16	32,00	92	0,50	6	6431250
4U80M200R7TG	20,0	20	38,00	104	1,00	6	6431401
4U80M250R8TG	25,0	25	45,00	121	1,00	6	6431402

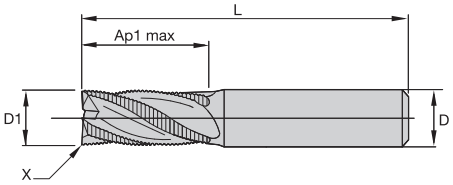
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Series 4970 • Metric







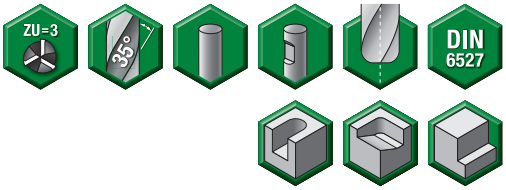


● first choice
○ alternate choice

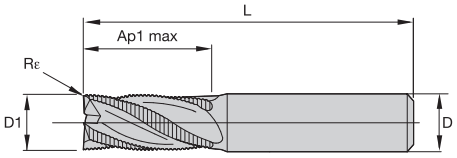
P	
M	●
K	
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S	●
H	

catalogue number	D1	D	length of cut Ap1 max	L3	length L	BCH	ZU	TiAlN-LT
497008003LT	8,0	8	16,00	16,00	63	0,60	6	1657243

Series DQ13 • Metric







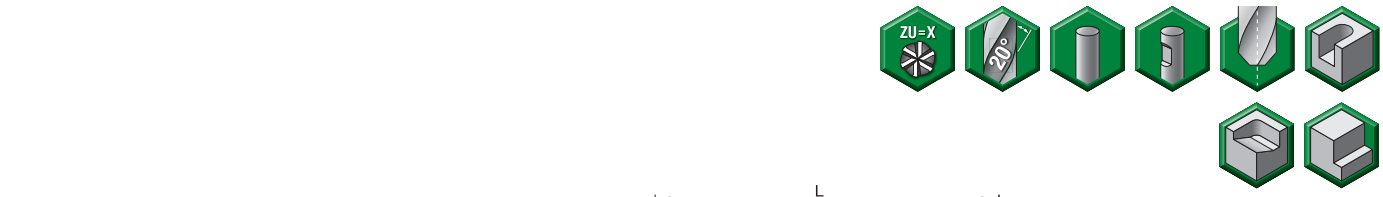
● first choice
○ alternate choice

P	●
M	○
K	●
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S	○
H	○

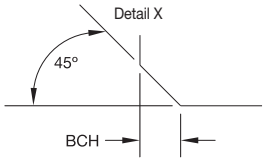
catalogue number	D1	D	length of cut Ap1 max	length L	Rε	WP15PE
DQ1303002W	3,0	6	7,00	54	0,25	5560536
DQ1305002W	5,0	6	10,00	57	0,25	5560538
DQ1306002W	6,0	6	10,00	57	0,45	5560539
DQ1312005W	12,0	12	22,00	83	0,45	5560703
DQ1314014W	14,0	14	22,00	83	0,45	5560704

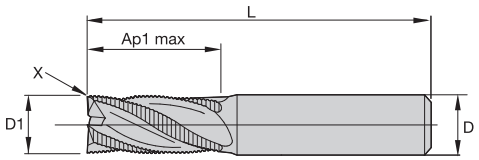
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Series 4906 • Metric







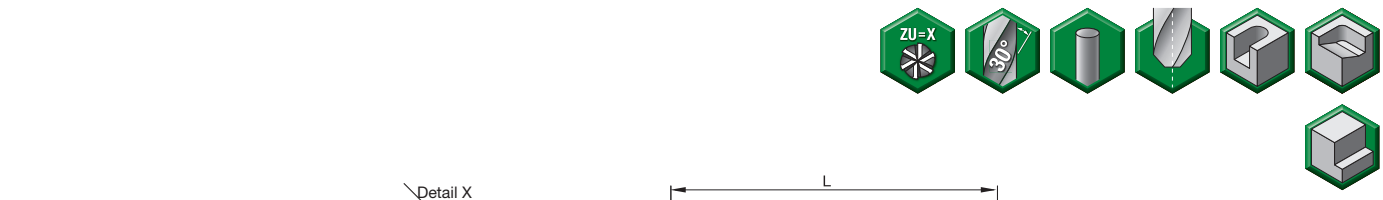


● first choice
○ alternate choice

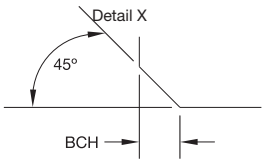
P	●
M	●
K	●
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S	○
H	●

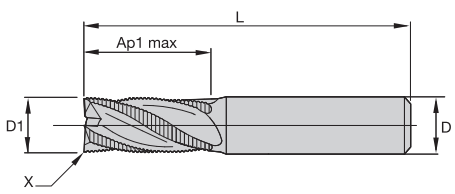
catalogue number	D1	D	length of cut Ap1 max	length L	BCH	ZU	WP15PE
490605002RW	5,0	6	13,00	57	0,30	3	1657010
490606002RW	6,0	6	13,00	57	0,30	3	1657019
490607003RW	7,0	8	16,00	63	0,30	3	1657025
490608003RW	8,0	8	16,00	63	0,30	3	1657034
490610004RT	10,0	10	22,00	72	0,50	4	1657050
490610004RW	10,0	10	22,00	72	0,50	4	1657051
490612005RT	12,0	12	26,00	83	0,50	4	1657063
490612005RW	12,0	12	26,00	83	0,50	4	1657064
490616006RT	16,0	16	32,00	92	0,50	4	1657096
490616006RW	16,0	16	32,00	92	0,50	4	1657097
490620007RW	20,0	20	38,00	104	0,50	4	1657113

Series 4976 • Metric







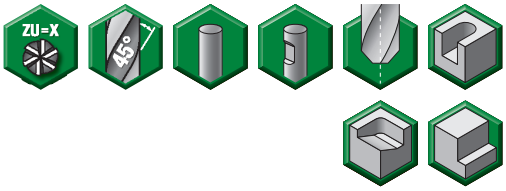


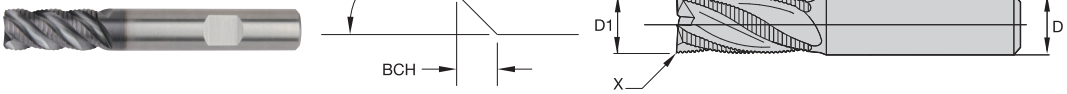
● first choice
○ alternate choice

P	●
M	●
K	●
N	
S	○
H	●

catalogue number	D1	D	length of cut Ap1 max	length L	BCH	ZU	WP15PE
497604002T	4,0	6	8,00	57	0,30	3	5560708
497605002T	5,0	6	13,00	57	0,30	3	5560709
497606002T	6,0	6	13,00	57	0,30	3	5560710
497608003T	8,0	8	16,00	63	0,30	3	5560711
497610004T	10,0	10	22,00	72	0,50	4	5560712
497612005T	12,0	12	26,00	83	0,50	4	5560713
497614014T	14,0	14	26,00	83	0,50	4	5560714
497616006T	16,0	16	32,00	92	0,50	4	5560715
497620007T	20,0	20	38,00	104	0,50	4	5560717

Series 4U70 • Metric



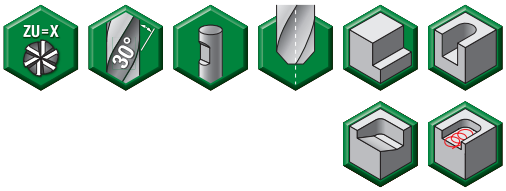


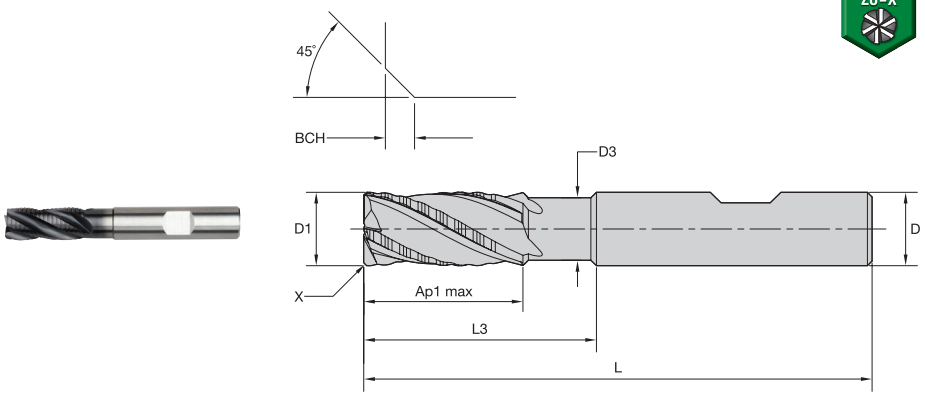
● first choice
○ alternate choice

P	○
M	●
K	○
N	
S	○
H	●

catalogue number	D1	D	length of cut Ap1 max	length L	BCH	ZU	WP15PE
4U7006002W	6,0	6	13,00	57	0,30	4	**5583436**
4U7008003W	8,0	8	16,00	63	0,40	4	**5583437**
4U7012005W	12,0	12	26,00	83	0,60	4	**5583439**
4U7016006W	16,0	16	32,00	92	0,60	6	**5583440**
4U7016046T	16,0	16	32,00	92	0,60	4	**5583431**
4U7020047T	20,0	20	38,00	104	1,00	4	**5583433**

Series 49N6 • Metric





● first choice
○ alternate choice

P	●
M	○
K	●
N	
S	○
H	●

catalogue number	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU	WP15PE
49N606002MW	6,0	6	5,50	13,00	21,00	57	0,30	3	**3474585**
49N608003MW	8,0	8	7,50	16,00	27,00	63	0,30	3	**3474587**
49N610004MW	10,0	10	9,50	22,00	32,00	72	0,50	4	**3474589**
49N612005MW	12,0	12	11,00	26,00	38,00	83	0,50	4	**3474591**
49N616006MW	16,0	16	15,00	32,00	44,00	92	0,50	4	**3474594**

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Application Data • Series 4U50 • Metric



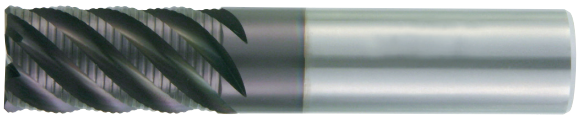


Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — Vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
M	1	0,8 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	0,8 x D	0,4 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	0,8 x D	0,4 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,8 x D	0,25 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	4	0,8 x D	0,3 x D	0,3 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters greater than 12mm.

Application Data • Series 4U80 • Metric



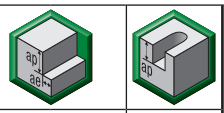


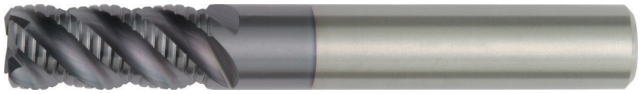
Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — Vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1 x D	0,5 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1 x D	0,5 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	1 x D	0,3 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters greater than 12mm.

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Application Data • Series 4970 • Metric

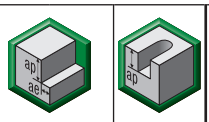


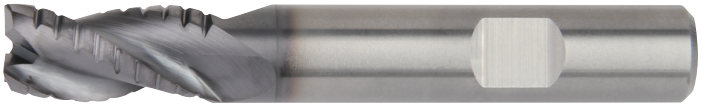


Material Group		A ap	A ae	B ap	TiCN Cutting Speed — vc m/min min		TiCN max	TiAlN Cutting Speed — vc m/min min		TiAlN max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. mm	D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	3	1 x D	0,5 x D	0,5 x D	96	–	128	120	–	160	fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	4	1 x D	0,3 x D	0,4 x D	72	–	120	90	–	150	fz	0,028	0,038	0,046	0,056	0,069	0,088	0,098
	5	1 x D	0,5 x D	0,5 x D	48	–	80	60	–	100	fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	6	1 x D	0,3 x D	0,4 x D	40	–	60	50	–	75	fz	0,021	0,029	0,034	0,042	0,051	0,065	0,071
M	1	1 x D	0,5 x D	0,5 x D	64	–	80	80	–	100	fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	2	1 x D	0,5 x D	0,5 x D	48	–	64	60	–	80	fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	3	1 x D	0,5 x D	0,5 x D	48	–	64	60	–	80	fz	0,021	0,029	0,034	0,042	0,051	0,065	0,071
K	1	1 x D	0,5 x D	0,5 x D	96	–	128	120	–	160	fz	0,037	0,051	0,061	0,075	0,091	0,114	0,124
	2	1 x D	0,5 x D	0,5 x D	88	–	112	110	–	140	fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	3	1 x D	0,5 x D	0,5 x D	80	–	104	100	–	130	fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
S	1	1 x D	0,3 x D	0,3 x D	40	–	72	50	–	90	fz	0,031	0,043	0,051	0,063	0,078	0,101	0,114
	2	1 x D	0,3 x D	0,3 x D	16	–	32	20	–	40	fz	0,017	0,022	0,027	0,033	0,042	0,054	0,061
	3	1 x D	0,4 x D	0,4 x D	40	–	64	50	–	80	fz	0,025	0,034	0,041	0,051	0,063	0,081	0,091
	4	1 x D	0,4 x D	0,4 x D	36	–	52	45	–	65	fz	0,022	0,031	0,038	0,046	0,058	0,074	0,084
H	1	1 x D	0,3 x D	0,3 x D	64	–	112	80	–	140	fz	0,028	0,038	0,046	0,056	0,069	0,088	0,098
	2	1 x D	0,2 x D	0,2 x D	56	–	96	70	–	120	fz	0,021	0,029	0,034	0,042	0,051	0,065	0,071
	3	1 x D	0,2 x D	0,2 x D	48	–	72	60	–	90	fz	0,017	0,023	0,027	0,034	0,041	0,052	0,057

NOTE: Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For rougher tool with 6 flutes, use ap in slotting 60% of table value.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters >12mm.

Application Data • Series DQ13 • Metric



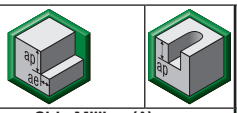


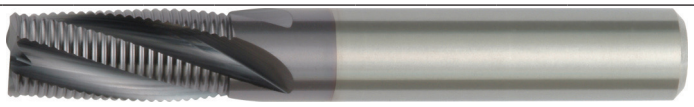
Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 3,0	4,0	5,0	6,0	7,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1 x D	0,5 x D	0,75 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,052	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1 x D	0,5 x D	0,75 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,052	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1 x D	0,5 x D	0,75 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,052	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1 x D	0,5 x D	0,75 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,043	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1 x D	0,5 x D	0,5 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,039	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1 x D	0,5 x D	0,75 x D	60	–	100	fz	0,014	0,019	0,024	0,029	0,035	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	6	1 x D	0,4 x D	0,5 x D	50	–	75	fz	0,012	0,016	0,020	0,025	0,029	0,034	0,040	0,047	0,052	0,057	0,061	0,065
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,043	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,4 x D	0,75 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,035	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	3	1 x D	0,4 x D	0,75 x D	60	–	70	fz	0,012	0,016	0,020	0,025	0,029	0,034	0,040	0,047	0,052	0,057	0,061	0,065
K	1	1 x D	0,5 x D	0,75 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,052	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1 x D	0,5 x D	0,75 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,043	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	3	1 x D	0,4 x D	0,75 x D	110	–	130	fz	0,014	0,019	0,024	0,029	0,035	0,040	0,048	0,056	0,063	0,070	0,076	0,081
S	1	1 x D	0,3 x D	0,4 x D	50	–	90	fz	0,017	0,023	0,030	0,036	0,043	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,009	0,013	0,016	0,019	0,023	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1 x D	0,4 x D	0,75 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,035	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,011	0,016	0,021	0,026	0,031	0,037	0,045	0,052	0,058	0,064	0,069	0,074
H	1	1 x D	0,2 x D	0,3 x D	80	–	140	fz	0,016	0,021	0,027	0,033	0,039	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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Application Data • Series 4906 • Metric

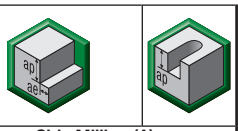


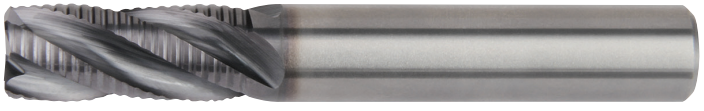


Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	4	1,5 x D	0,3 x D	0,3 x D	90	–	150	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083
	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
M	1	1,5 x D	0,4 x D	0,75 x D	90	–	115	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
	3	1,5 x D	0,4 x D	0,75 x D	60	–	70	fz	0,014	0,017	0,021	0,029	0,034	0,040	0,044	0,048	0,052	0,055	0,060
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	3	1,5 x D	0,4 x D	1 x D	110	–	130	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
S	1	1,5 x D	0,4 x D	0,75 x D	50	–	90	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	3	1,5 x D	0,3 x D	0,3 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • Series 4976 • Victory™ Grades



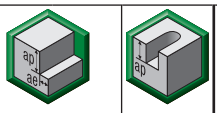
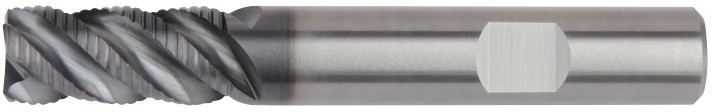


Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min		max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,4 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
M	1	1,5 x D	0,4 x D	0,75 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,4 x D	0,75 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,4 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,75 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	4	1,5 x D	0,3 x D	0,75 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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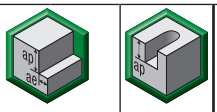
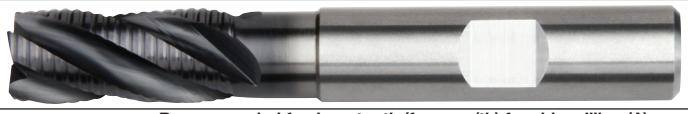
Application Data • Series 4U70 • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min	–	max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 6,0	8,0	10,0	12,0	16,0	20,0	25,0
P	3	1 x D	0,5 x D	0,75 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	4	1 x D	0,3 x D	0,75 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	5	1 x D	0,5 x D	0,75 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	6	1 x D	0,3 x D	0,3 x D	50	–	75	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1 x D	0,5 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	3	1 x D	0,5 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
K	1	1 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,101	0,114	0,124
	2	1 x D	0,5 x D	1 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	3	1 x D	0,5 x D	1 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
S	1	1 x D	0,3 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,087	0,101	0,114
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061
	3	1 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,070	0,081	0,091
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,064	0,074	0,084
H	1	1 x D	0,3 x D	0,3 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,077	0,088	0,098
	2	1 x D	0,2 x D	0,2 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,057	0,065	0,071
	3	1 x D	0,2 x D	0,2 x D	60	–	90	fz	0,019	0,026	0,032	0,037	0,046	0,054	0,061

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For rougher tool with 6 flutes, use ap in slotting 60% of table value.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • Series 49N6 • Metric

Material Group		Side Milling (A) and Slotting (B) A ap	ae	B ap	WP15PE Cutting Speed — vc m/min min	–	max	mm	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter 4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	4	1,5 x D	0,3 x D	0,5 x D	90	–	150	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083
	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
M	1	1,5 x D	0,4 x D	0,75 x D	80	–	100	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
	3	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,014	0,017	0,021	0,029	0,034	0,040	0,044	0,048	0,052	0,055	0,060
K	1	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,024	0,031	0,037	0,051	0,061	0,070	0,079	0,086	0,092	0,097	0,105
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	3	1,5 x D	0,4 x D	1 x D	100	–	130	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
S	1	1,5 x D	0,4 x D	0,75 x D	50	–	90	fz	0,020	0,025	0,031	0,043	0,051	0,060	0,067	0,074	0,080	0,086	0,097
	3	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,016	0,021	0,025	0,034	0,041	0,048	0,054	0,059	0,064	0,069	0,077
H	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,018	0,023	0,028	0,038	0,046	0,053	0,060	0,065	0,070	0,075	0,083

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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Table of Factors to Maximise Ball Nose Cutting Speed for Hard Machining • Metric

Calculation Examples

Table of Factors for Speed Calculation of Ball Nose							
Average Wall Angle	ap/D						
	0.003	0.006	0.010	0.016	0.020	0.025	0.030
0.0°	9.1	6.5	5.0	4.0	3.6	3.2	2.9
3.0°	6.2	4.9	4.0	3.3	3.0	2.8	2.6
5.0°	5.1	4.2	3.5	3.0	2.8	2.5	2.4
8.0°	4.1	3.4	3.0	2.6	2.4	2.3	2.1
10.0°	3.6	3.1	2.7	2.4	2.3	2.1	2.0
15.0°	2.8	2.5	2.2	2.0	1.9	1.8	1.7
20.0°	2.3	2.1	1.9	1.8	1.7	1.6	1.6
30.0°	1.7	1.6	1.5	1.4	1.4	1.3	1.3
40.0°	1.4	1.3	1.3	1.2	1.2	1.2	1.2
50.0°	1.2	1.2	1.1	1.1	1.1	1.1	1.1
55.0°	1.1	1.1	1.1	1.1	1.1	1.0	1.0

*For calculating real cutting speed, use formula: Basic cutting speed * Factor*

Choose the coefficient according to the ap/D and average wall angle.

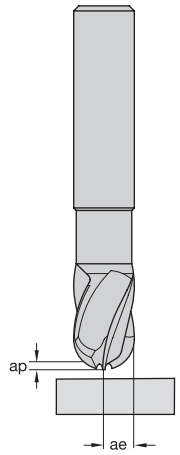
Example 1:
For Tool = 10mm and ap = 0,2mm for average wall angle 0°, ap/D ratio equal 0,2/10 = 0,02. Factor equal 3.6.

Example 2:
For Tool = 8mm and ap = 0,1mm for average wall angle 10°, ap/D ratio equal 0,1/8 = 0,0125. Factor will be between 2.7 and 2.4, choose 2.6.

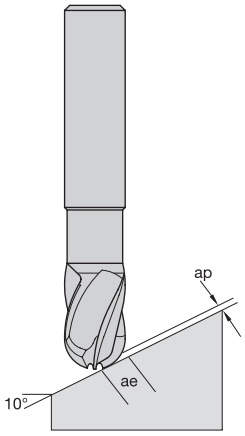
Keep in mind shank diameter and length effect.

If tool length out of the chuck is more than 2 x D, please decrease feed per tooth by 15% each 1 x D.

Material Group	TiAlN or AlTiN Basic Cutting Speed Vc m/min		
	min		max
P3	160	–	180
P4	140	–	160
H1	100	–	140
H2	70	–	120
H3	60	–	90
H4	50	–	70



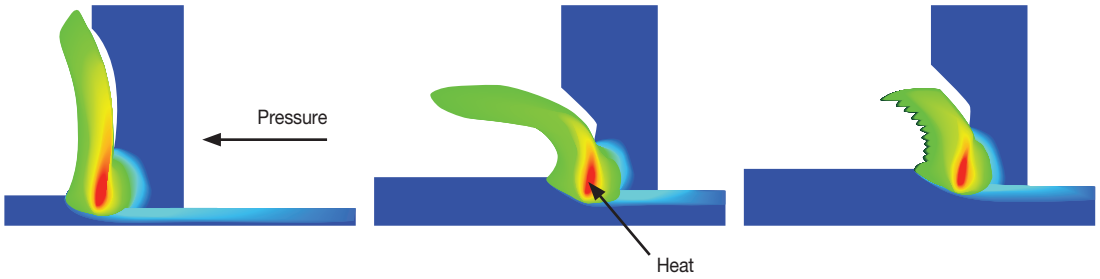
Application example #1 =
face milling a flat surface
D = 10mm
ap = 0,2mm
Average wall angle = 0°
Finishing H2
Starting vc from chart = 100
ap/D = 0.02
Factor from table =
3.6
vc to programme into machine = 100 * 3.6 = 360 m/min
RPM = 360* 1000/3.14/10 = 11460 RPM



Application example #2 =
face milling a 10° average wall angle
D = 8mm
ap = 0,1mm
Average wall angle = 10°
Finishing H2
Starting vc from chart = 100
ap/D = 0,1/8 = 0,0125
Factor from table =
2.6
vc to programme into machine = 100 * 2.6 = 260 m/min
RPM = 260* 1000/3.14/10 = 7640 RPM

Trochoidal Milling

▼ Cutting Speed

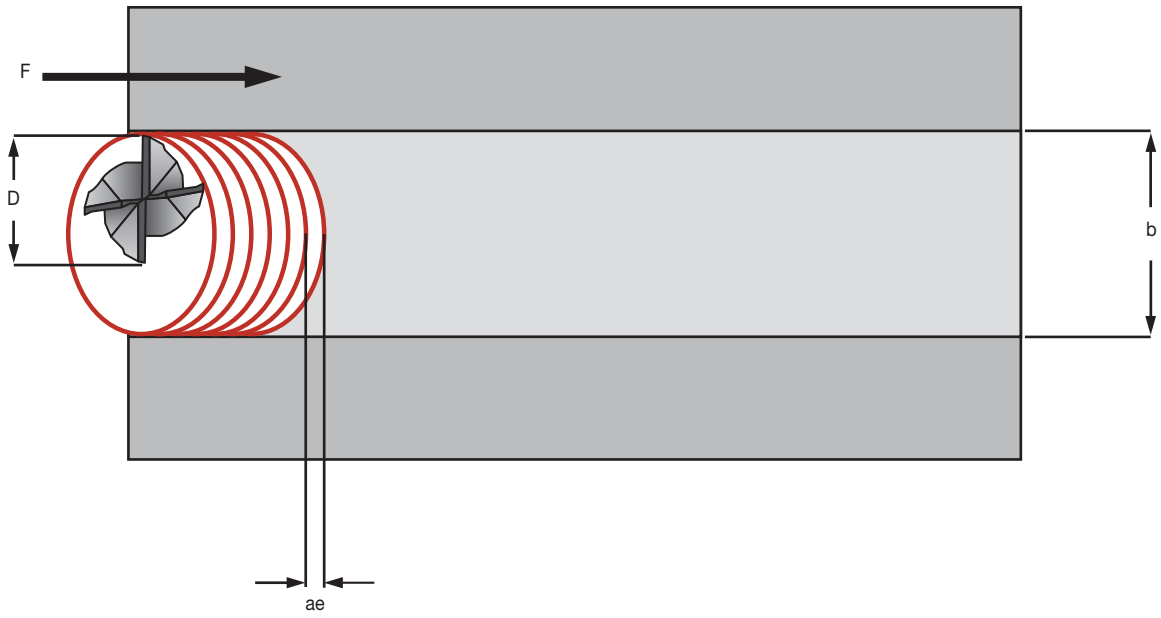


Reduced radial engagement influences the cutting speed, because the heat produced through the cutting process limits the cutting speed.

ae/D	full slot	50% ae	40% ae	30% ae	20% ae	10% ae	5% ae	4% ae
speed factors	0,9	1	1,1	1,2	1,3	1,4	2,5	3
phi [°]	180	90	78,46	66,42	53,13	36,87	25,84	23,07

▼ Static Trochoidal Milling for a Full Slot

- Use a tool in which D < b.
- Programme circles in the CNC programme (as a cycle).
- After one circle, repeat the same with an offset.
- Optimise by shortening the lane “in the air” to a form like a “D”.



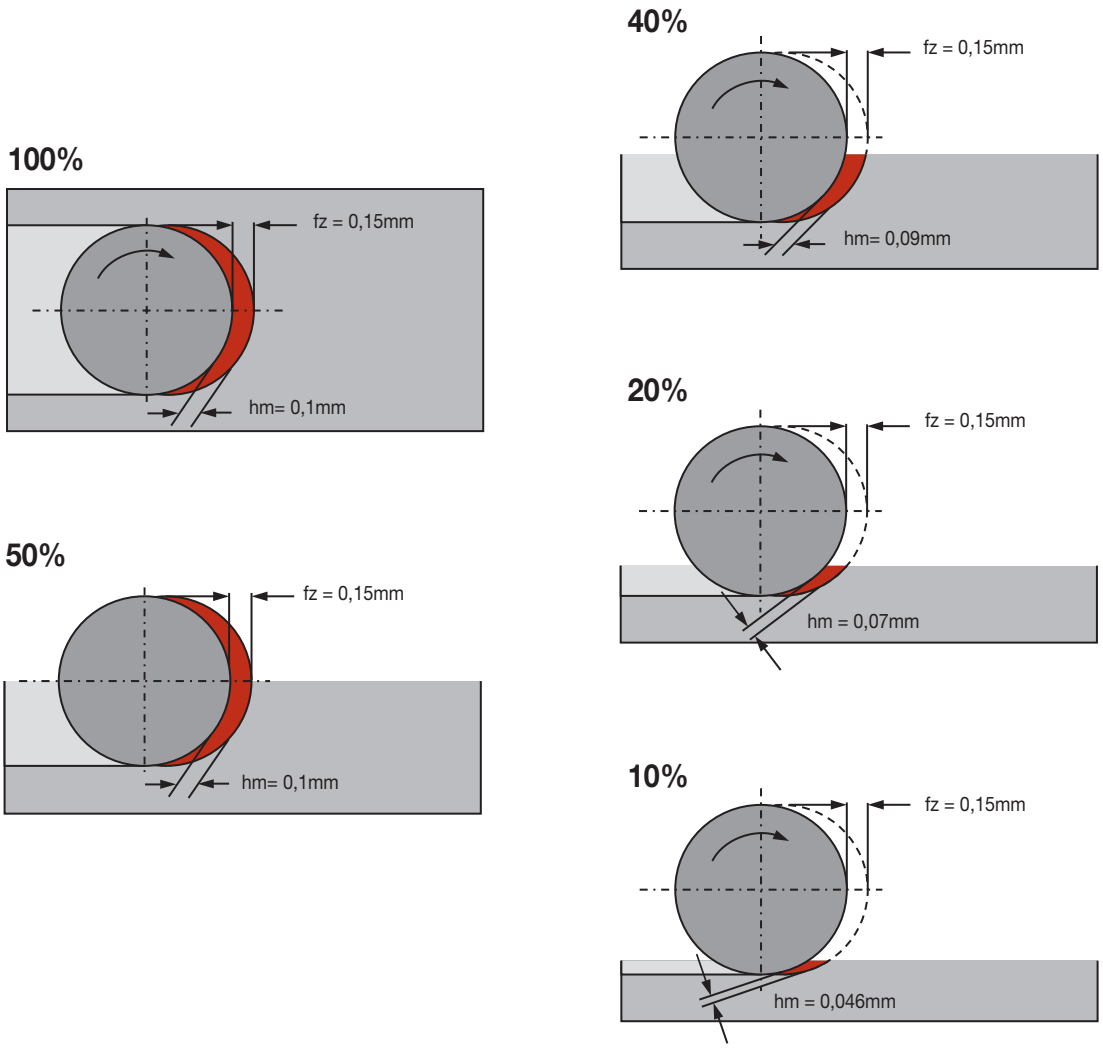
Trochoidal Milling can be performed with solid or indexable milling tools.

Trochoidal Milling

▼ ae and Chip Thickness

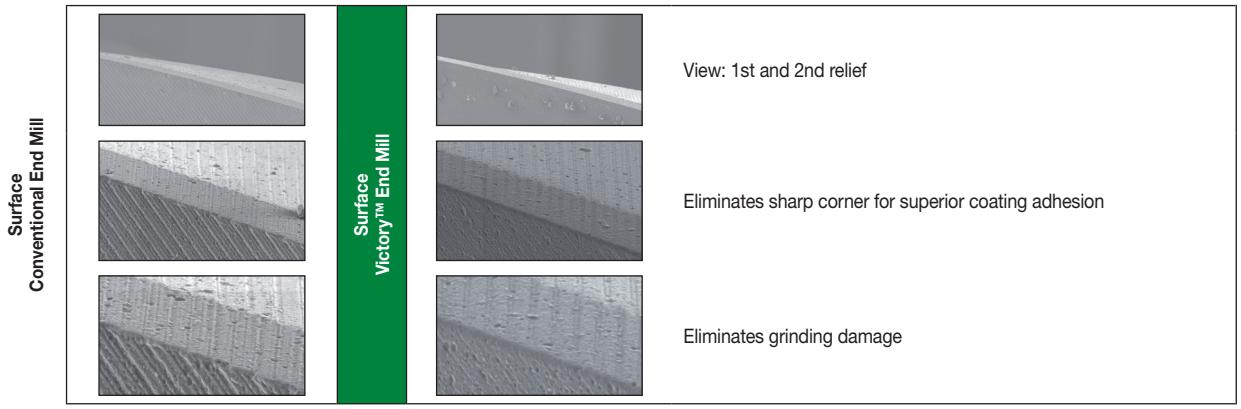
chip thinning effect		
ae	**programmed feed (fz)**	**chip thickness (hm)**
100%	0,15mm	0,1mm
50%	0,15mm	0,1mm
40%	0,15mm	0,09mm
20%	0,15mm	0,07mm
10%	0,15mm	0,046mm

The chip thickness needs to be compensated by feed.



Innovative Advantage of Victory™ Grades

WIDIA VICTORY



WP15PE™	WS15PE™
W = WIDIA™	W = WIDIA
P = Steels	S = High-Temp Alloys
15 = Application Range (Medium to Roughing)	15 = Application Range (Medium to Roughing)
P = Carbide + PVD	P = Carbide + PVD
E = Solid End Mills	E = Solid End Mills
Primary Materials	**Primary Materials**
P0 through P4 Steels	S1 through S4 High-Temp Alloys
M1 through M3 Austenitic Stainless Steels	P5 through P6 Ferritic and Martensitic Stainless Steels
K1 through K3 Cast Irons	H1 Hardened Steels
H1 Hardened Steels	
Secondary Materials	**Secondary Materials**
S1 through S4 High-Temp Alloys	M1 through M3 Austenitic Stainless Steels
H2 Hardened Steels	H2 Hardened Steels

The new Victory grades are spread across the high-performance offering, including high-performance roughers, high-performance finishers, and select VariMill™ platforms.

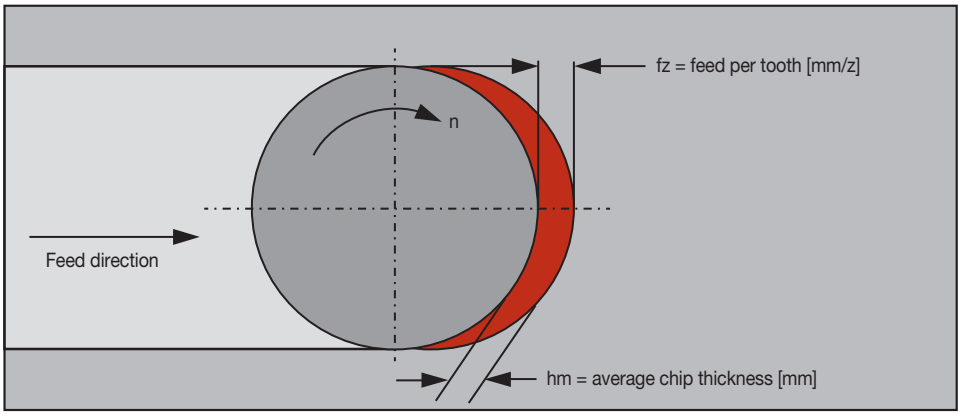
WIDIA VICTORY

Metric	series	Victory Grade		● first choice ○ alternate choice					
		WP15PE	WS15PE	P	M	K	N	S	H
VariMill I™	4777, 47N0	✓		●	●	●		○	○
VariMill II™	577C	✓		●	●	●		○	○
VariMill II™	57NC		✓	○	○			●	○
VariMill II™ ER	577E, 57NE		✓	○	○			●	○
HP Roughers	DQ13, 4976, 4U40, 4U70	✓		●	●	●		○	○
HP Finishers	4001JJ, 4503JJ, D507, D518	✓		●	●	●		○	○

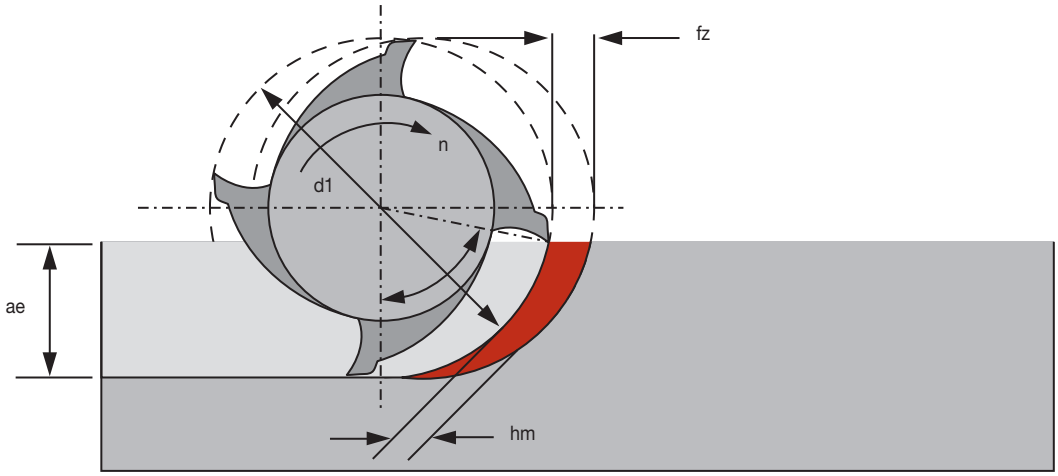
Trochoidal Milling

▼ Conventional Slotting

- Full slotting limitations:
  - Usually not more then ap = 1 x D.
  - Conventional and climb milling at the same time.
  - High heat development on the tool and on the workpiece.
  - Difficult chip evacuation.
  - High radial forces.
- This means:
  - No constant chip thickness.
  - Low MRR.
  - Surface quality from the left to right side are different.
  - Limited tool life.
  - High power and torque requirements for the machine.



▼ ae and Chip Thickness



To calculate average chip thickness:

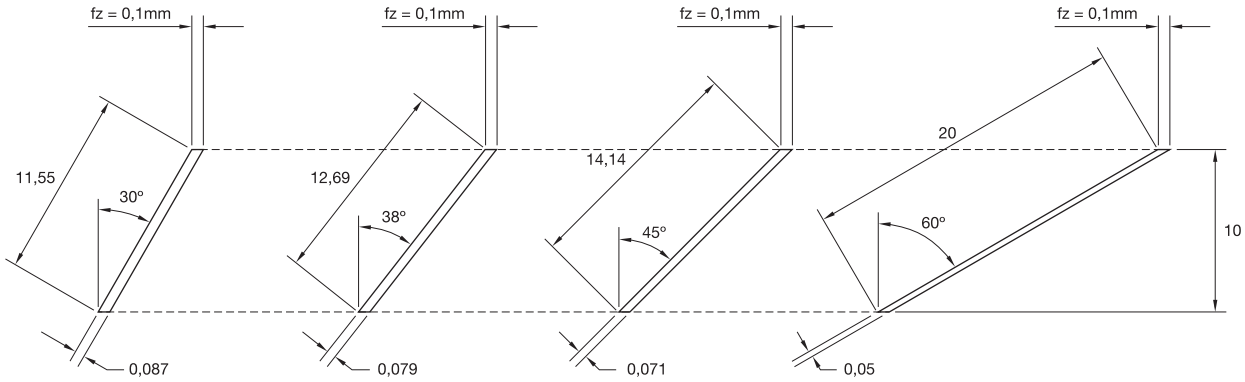
$$hm = fz \bullet \left(\sqrt{\frac{ae}{d1}}\right)$$

Simplified formula for shown application and 90° angles on the tool.
The chip thickness defines the load on the cutting edge.

Trochoidal Milling

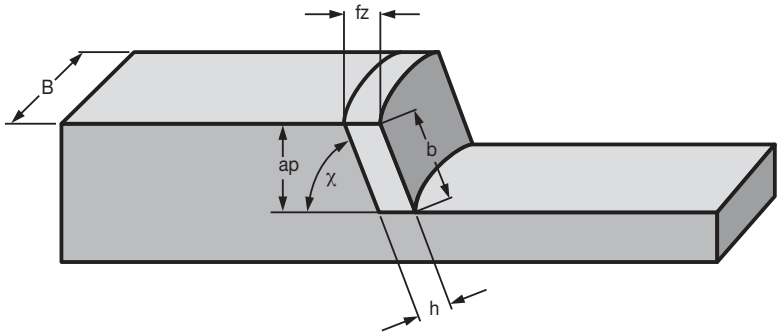
▼ Helix Angle and Chip Thickness

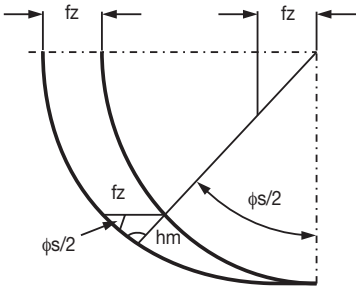
The chip thickness (h) depends on the helix angle of the cutting edge. If the feed fz is constant, the chip thickness gets thinner as helix angle rises. That means with more helix angle, the chip gets thinner — or you can rise feed rate to increase productivity and load to the cutting edge.



▼ Calculation of Chip Thickness

The chip thickness (h) is not constant, but defines the load of the cutting edge. By reducing the load on the cutting edge, machining at higher speeds is possible through the machining parameters. For easier calculation, use an average chip thickness hm. When calculating machining data this way cutting data may be compromised because the workpiece is often a different shape.





$$hm = \frac{360°}{\pi \bullet \phi s} \bullet \frac{ae}{D} \bullet fz \bullet \sin \chi$$

hm [mm]	=	average chip thickness
ϕs [°]	=	engagement angle
ae [mm]	=	width of engagement
D1 [mm]	=	outer diameter tool
fz [mm]	=	feed per tooth
χ [°]	=	lead angle
λ [°]	=	helix angle *

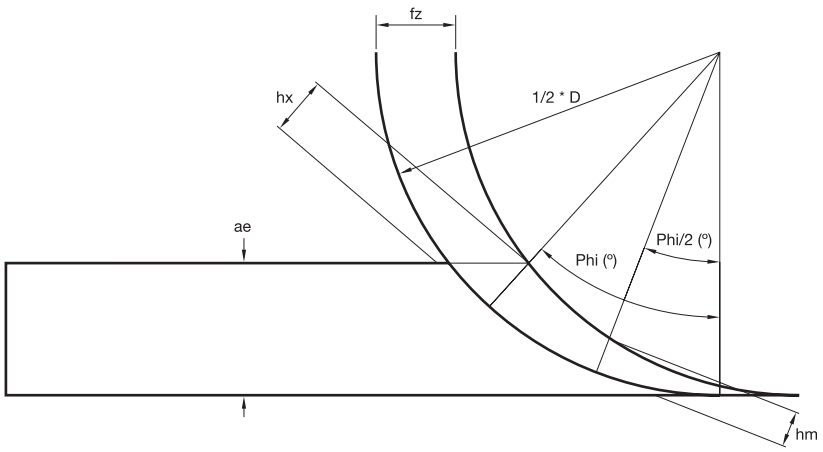
* Solid End Mills: $\chi = 90° - \lambda$

NOTE: It makes no difference if the tool is solid or an indexable milling tool.

Trochoidal Milling

▼ Differences between hm and hx

In conventional milling, it makes sense to calculate the load to the cutting edge through hm. With reducing the ae to very low values, you can calculate with the maximum chip thickness hx to make sure that the feed per tooth is set up correctly.



Conventional

$hm = 360°/\pi \cdot \phi s \cdot ae/D \cdot fz \cdot \sin x$

hm [mm]	=	average chip thickness
fs [°]	=	engagement angle
ae [mm]	=	width of engagement
D1 [mm]	=	outer diameter tool
fz [mm]	=	feed per tooth
χ [°]	=	lead angle
λ [°]	=	helix angle *

Smart Machining

$hx = 360°/\pi \cdot \phi s \cdot 2 \cdot ae/D \cdot fz \cdot \sin x$

hx [mm]	=	maximum chip thickness
fs [°]	=	engagement angle
ae [mm]	=	width of engagement
D1 [mm]	=	outer diameter tool
fz [mm]	=	feed per tooth
χ [°]	=	lead angle
λ [°]	=	helix angle *

* Solid End Mills: $\chi = 90° - \lambda$

Trochoidal Milling can be performed with solid or indexable milling tools.

GENERAL PURPOSE SOLID CA

2-FLUTE GP

Pages B60–B67

- D002/D012/4002/4012
- D001/D011/2838/4001/4011/4021





3-FLUTE GP

Pages B60, B68–B71

- 4003/4013/D003/D013

RBIDE END MILLS

ALL-STAR



4-FLUTE GP

Pages B60, B72–B78

- 4004/4014/2528/4004/4014/4024
- D010/4000/4010
- 4004/4014/4024

WIDIA-Hanita™ General Purpose End Mills offer plunging, slotting, and profiling for a wide range of materials and applications. Designed to provide high metal removal rates and excellent surface conditions at a value price.

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General Purpose End Mills

2-, 3-, and 4-Flute General Purpose Solid Carbide End Mills

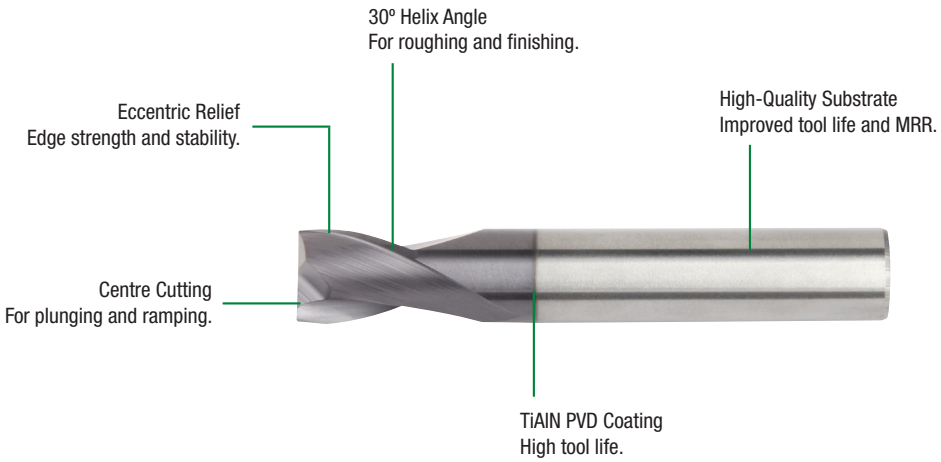
A wide range of diameters, lengths, and corner styles (such as chamfered, sharp edge, and ball nose) are available from stock.

2-, 4-Flute Materials:

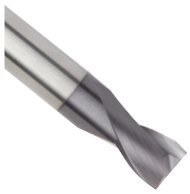
P M K

3-Flute Materials:

P M K N



2-Flute



D002 D012/4002 4012

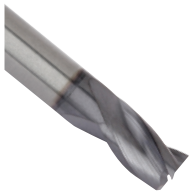
- Wide range of lengths-of-cut — short, regular, long, and extra long.
- Steel, stainless steel, and cast iron.
- Centre cut.



D001/D011/2838/4001/4011/4021

- Wide range of lengths-of-cut — short, regular, long, and extra long.
- Steel, stainless steel, and cast iron.
- Centre cut ball nose.

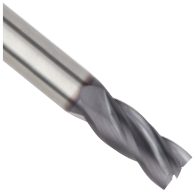
3-Flute



4003/4013/D003/D013

- Centre cutting.
- Short length-of-cut and overall length for ramping applications.
- Steel, stainless, and cast iron.

4-Flute



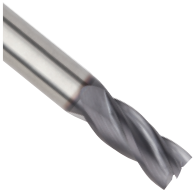
4004/4014/2528/4004/4014/4024

- Wide range of lengths-of-cut — short, regular, long, and extra long.
- Steel, stainless steel, and cast iron.



D010/4000/4010

- Wide range of lengths-of-cut — short, regular, long, and extra long.
- Steel, stainless steel, and cast iron.
- Centre cut ball nose.

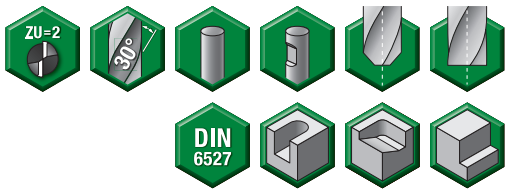


4004/4014/4024

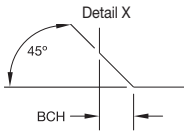
- Regular length-of-cut with corner radius.
- Steel, stainless steel, and cast iron.
- Centre cut.

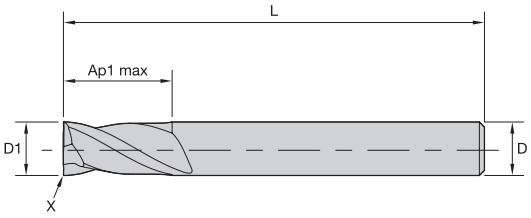
FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES B61–B78.

Series D002 • Metric









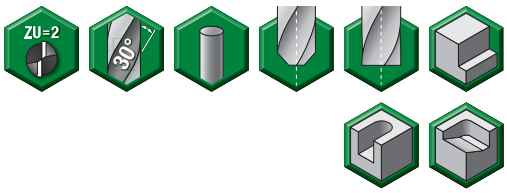
● first choice
○ alternate choice

P		●
M		●
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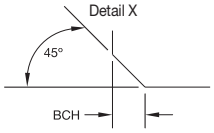
catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
D0020300T004	3,0	6	4,00	50	–	5877503

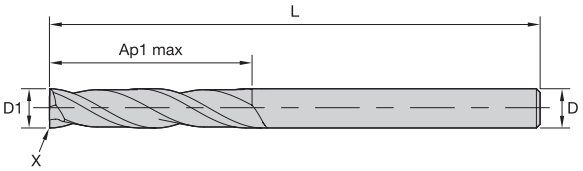
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Series 4002 4012 • Metric









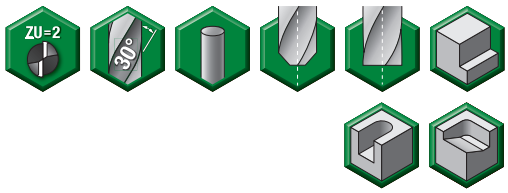
● first choice
○ alternate choice

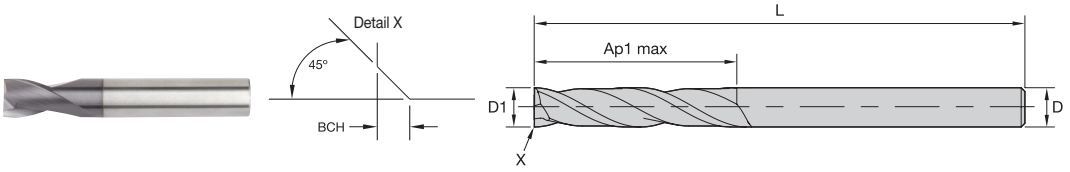
P	●
M	●
K	●
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catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
40020100T004	1,0	3	4,00	38	–	5873484
40020150T004	1,5	3	4,00	38	–	5873485
40020180T004	1,8	3	4,00	38	–	5873486
40020200T006	2,0	3	6,30	38	–	5873487
40020250T006	2,5	3	6,30	38	–	5873488
40020300T009	3,0	3	9,50	38	–	5873489
40020300T019	3,0	3	19,00	63	–	5873490
40120300T025	3,0	3	25,00	75	–	5873491
40020350T012	3,5	4	12,00	54	–	5873492
40020400T012	4,0	4	12,00	50	0,10	5873493
40020400T012S	4,0	4	12,00	50	–	6092621
40020400T019	4,0	4	19,00	63	0,10	5873494
40020400T019S	4,0	4	19,00	63	–	6092622
40120400T031S	4,0	4	31,00	75	–	6092623
40120400T031	4,0	4	31,00	75	0,10	5873495
40020450T014S	4,5	6	14,00	50	–	6092624
40020500T014S	5,0	5	14,00	50	–	6092627
40020500T014	5,0	5	14,00	50	0,10	5873498
40020500T020S	5,0	5	20,00	63	–	6092628
40020500T020	5,0	5	20,00	63	0,10	5873499
40120500T031S	5,0	5	31,00	100	–	6092631
40120500T031	5,0	5	31,00	100	0,10	5873500
40020550T014	5,5	6	14,00	50	0,10	5873501
40020550T014S	5,5	6	14,00	50	–	6092632
40020600T016S	6,0	6	16,00	50	–	6092633
40020600T016	6,0	6	16,00	50	0,10	5873502
40020600T028	6,0	6	28,00	76	0,10	5873503
40020600T028S	6,0	6	28,00	76	–	6092634
40120600T038S	6,0	6	38,00	100	–	6092636
40120600T038	6,0	6	38,00	100	0,10	5873504
40020700T020	7,0	7	20,00	63	0,10	5873505
40020700T020S	7,0	7	20,00	63	–	6092637
40020800T020	8,0	8	20,00	63	0,20	5873506
40020800T020S	8,0	8	20,00	63	–	6092638
40020800T028S	8,0	8	28,00	76	–	6092639
40020800T028	8,0	8	28,00	76	0,20	5873507
40120800T041S	8,0	8	41,00	100	–	6092640
40120800T041	8,0	8	41,00	100	0,20	5873508
40020900T020	9,0	9	20,00	63	0,20	5873509
40020900T020S	9,0	9	20,00	63	–	6092641
40021000T022	10,0	10	22,00	72	0,20	5873510
40021000T022S	10,0	10	22,00	72	–	6092643
40021000T032S	10,0	10	32,00	89	–	6092644
40021000T032	10,0	10	32,00	89	0,20	5873511
40121000T045S	10,0	10	45,00	100	–	6092645
40121000T045	10,0	10	45,00	100	0,20	5873512
40021100T025S	11,0	11	25,00	76	–	6092646
40021100T025	11,0	11	25,00	76	0,30	5873513
40021200T025	12,0	12	25,00	76	0,30	5873514
40021200T025S	12,0	12	25,00	76	–	6092647
40021200T045	12,0	12	45,00	100	0,30	5873515
40021200T045S	12,0	12	45,00	100	–	6092648
40121200T075S	12,0	12	75,00	150	–	6092650
40121200T075	12,0	12	75,00	150	0,30	5873516
40021400T032S	14,0	14	32,00	83	–	6092651
40021400T032	14,0	14	32,00	83	0,30	5873517

Series 4002 4012 • Metric

(continued)





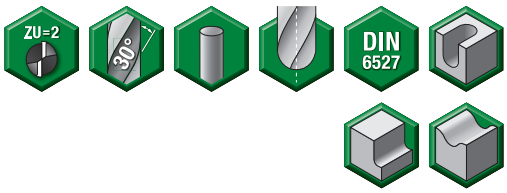
● first choice
○ alternate choice

P		●
M		●
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S		
H		

catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
40021400T050S	14,0	14	50,00	100	–	**6092653**
40021400T050	14,0	14	50,00	100	0,30	**5873518**
40121400T075S	14,0	14	75,00	150	–	**6092654**
40121400T075	14,0	14	75,00	150	0,30	**5873519**
40021600T032	16,0	16	32,00	89	0,30	**5873520**
40021600T032S	16,0	16	32,00	89	–	**6092657**
40021600T056S	16,0	16	56,00	110	–	**6092658**
40021600T056	16,0	16	56,00	110	0,30	**5873531**
40121600T075S	16,0	16	75,00	150	–	**6092659**
40121600T075	16,0	16	75,00	150	0,30	**5873532**
40021800T038	18,0	18	38,00	100	0,30	**5873533**
40021800T038S	18,0	18	38,00	100	–	**6092660**
40021800T060	18,0	18	60,00	125	0,30	**5873534**
40021800T060S	18,0	18	60,00	125	–	**6092681**
40022000T038S	20,0	20	38,00	104	–	**6092683**
40022000T038	20,0	20	38,00	104	0,30	**5873536**
40022000T056S	20,0	20	56,00	125	–	**6092684**
40122000T075S	20,0	20	75,00	150	–	**6092685**
40122000T075	20,0	20	75,00	150	0,30	**5873538**

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Series D001 D011 • Metric



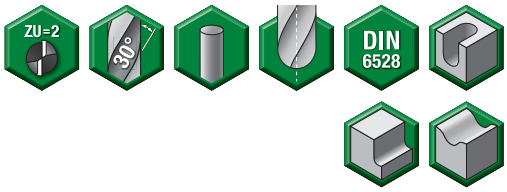


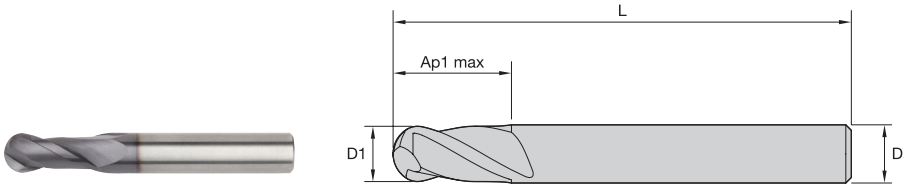
● first choice
○ alternate choice

P	●
M	●
K	●
N	
S	
H	

catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
D0110200T006	2,0	6	6,00	57	5880362
D0010300T004	3,0	6	4,00	50	5880363
D0110700T013	7,0	8	13,00	63	5880369
D0111000T019	10,0	10	19,00	72	5880381

Series 2838 • Metric





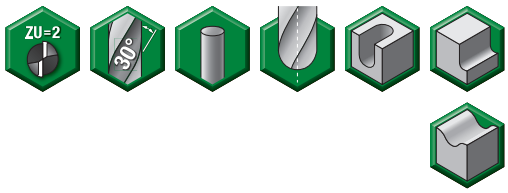
● first choice
○ alternate choice

P	●
M	●
K	●
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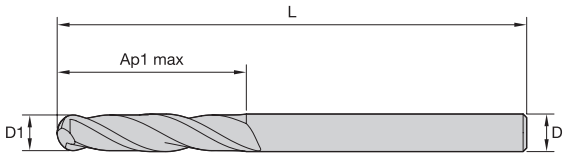
catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
28381600T026	16,0	16	26,00	92	5880460

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Series 4001 4011 4021 • Metric





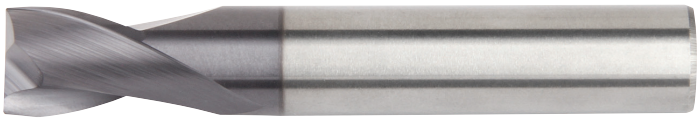


● first choice
○ alternate choice

P		●
M		●
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catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
40010100T004	1,0	3	4,00	38	**5880387**
40010150T005	1,5	3	5,00	38	**5880388**
40010200T006	2,0	3	6,30	38	**5880389**
40010250T007	2,5	3	7,00	38	**5880390**
40010300T009	3,0	3	9,50	38	**5880391**
40010400T012	4,0	4	12,00	50	**5880393**
40110400T019	4,0	4	19,00	63	**5880395**
40210400T031	4,0	4	31,00	75	**5880396**
40010500T014	5,0	5	14,00	50	**6209446**
40210500T014	5,0	6	14,00	50	**5880397**
40110500T020	5,0	5	20,00	63	**6209447**
40010600T020	6,0	6	20,00	63	**5880398**
40110600T028	6,0	6	28,00	76	**5880399**
40210600T038	6,0	6	38,00	100	**5880400**
40010800T020	8,0	8	20,00	63	**5880401**
40011000T022	10,0	10	22,00	76	**5880404**
40211000T045	10,0	10	45,00	100	**5880406**
40011200T025	12,0	12	25,00	75	**5880407**
40111200T045	12,0	12	45,00	100	**5880408**
40211600T075	16,0	16	75,00	150	**6209449**
40012000T038	20,0	20	38,00	100	**5880412**

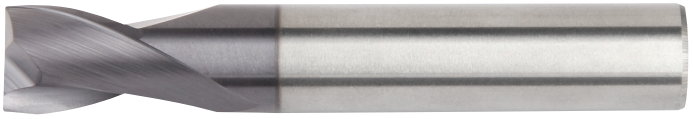
Application Data • Series D002 4002 • Metric



Material Group		Side Milling (A) and Slotting (B)			TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — vc m/min				D1 — Diameter												
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • Series D012 4012 • Metric

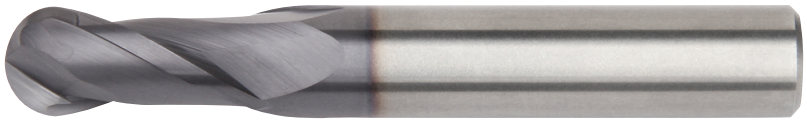


Material Group		Side Milling (A)		TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A).											
		A		Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	min		max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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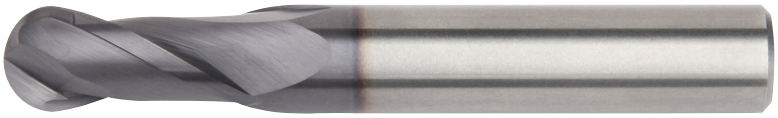
Application Data • Series D001 D011 2838 4001 • Metric



Material Group		Side Milling (A) and Slotting (B)			TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed – vc m/min				D1 — Diameter												
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.
For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • Series 4011 4021 • Metric

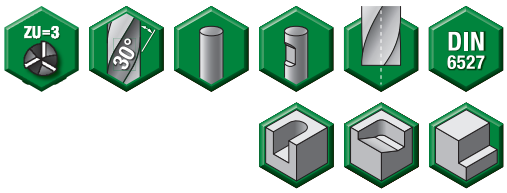


Material Group		Side Milling (A)		TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A).												
		A		Cutting Speed – vc m/min				D1 — Diameter												
		ap	ae	min		max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

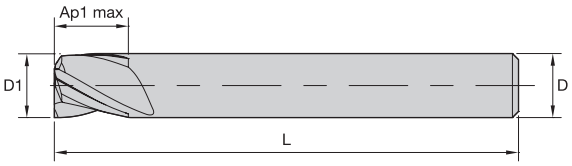
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.
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Series D003..S D013..S • Metric





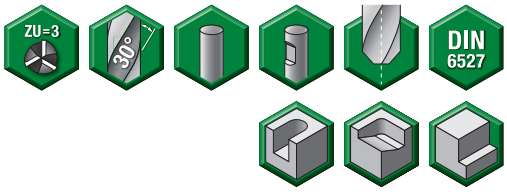


● first choice
○ alternate choice

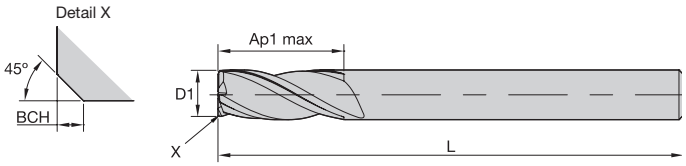
P		●
M		●
K		●
N		
S		
H		

catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
D0030300T004S	3,0	6	4,00	50	6144353
D0030350W004S	3,5	6	4,00	50	6144394

Series D003 D013 • Metric







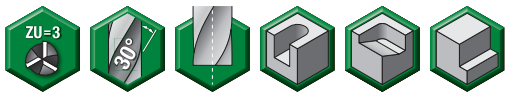
● first choice
○ alternate choice

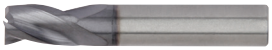
P		●
M		●
K		●
N		
S		
H		

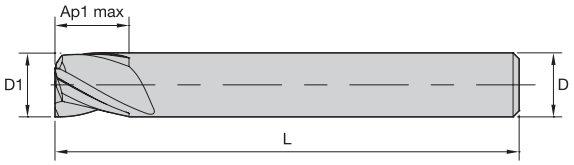
catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
D0130600T010	6,0	6	10,00	57	0,10	6144377
D0131000T019	10,0	10	19,00	72	0,20	6144383

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Series 4003..S 4013..S • Metric





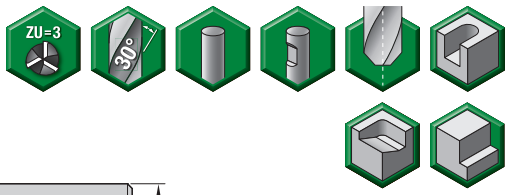


● first choice
○ alternate choice

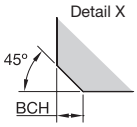
P		●
M		●
K		●
N		
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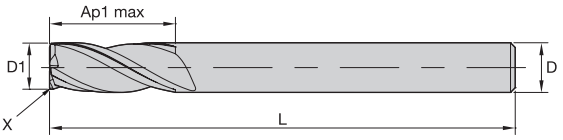
catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
40030100T004S	1,0	3	4,00	38	**6144056**
40030150T004S	1,5	3	4,00	38	**6144057**
40030200T006S	2,0	3	6,30	38	**6144058**
40030250T006S	2,5	3	6,30	38	**6144059**
40030300T009S	3,0	3	9,50	38	**6144060**
40130300T019S	3,0	6	19,00	63	**6145199**
40030400T012S	4,0	4	12,00	50	**6144551**
40130400T019S	4,0	4	19,00	63	**6145200**
40030500T014S	5,0	6	14,00	50	**6144552**
40130500T020S	5,0	6	20,00	63	**6145231**
40030600T016S	6,0	6	16,00	50	**6144553**
40130600T028S	6,0	6	28,00	75	**6145232**
40030800T019S	8,0	8	19,00	63	**6144554**
40130800T028S	8,0	8	28,00	75	**6145233**
40031000T022S	10,0	10	22,00	76	**6144555**
40131000T032S	10,0	10	32,00	89	**6145234**
40031200T025S	12,0	12	25,00	75	**6144556**
40131200T045S	12,0	12	45,00	100	**6145235**
40031600T032S	16,0	16	32,00	89	**6144557**
40131600T056S	16,0	16	56,00	110	**6145238**
40132000T064S	20,0	20	64,00	125	**6145241**

Series 4003 4013 • Metric









● first choice
○ alternate choice

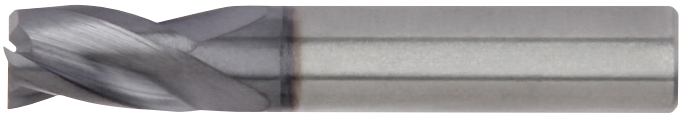
P		●
M		●
K		●
N		
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H		

catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
40030400T012	4,0	4	12,00	50	0,10	**6145107**
40130400T019	4,0	4	19,00	63	0,10	**6145181**
40130500T020	5,0	6	20,00	63	0,10	**6145182**
40030600T016	6,0	6	16,00	50	0,10	**6145109**
40130600T028	6,0	6	28,00	75	0,10	**6145183**
40030800T019	8,0	8	19,00	63	0,20	**6145110**
40130800T028	8,0	8	28,00	75	0,20	**6145184**
40031000T022	10,0	10	22,00	76	0,20	**6145171**
40131000T032	10,0	10	32,00	89	0,20	**6145185**
40031200T025	12,0	12	25,00	75	0,30	**6145172**
40131200T045	12,0	12	45,00	100	0,30	**6145186**
40031600T032	16,0	16	32,00	89	0,30	**6145173**
40131600T056	16,0	16	56,00	110	0,30	**6145187**

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Application Data • Series D003..S D013..S D003 D013 4003..S 4003 • Metric

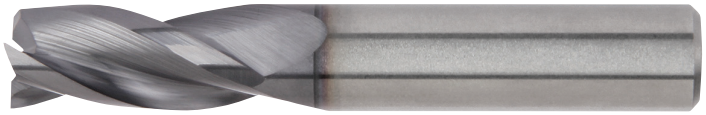




Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters >12mm.

Application Data • Series 4013..S 4013 • Metric

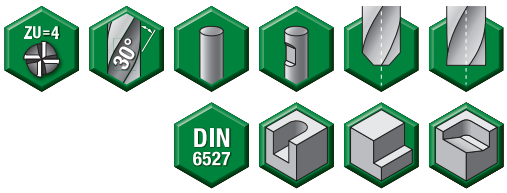



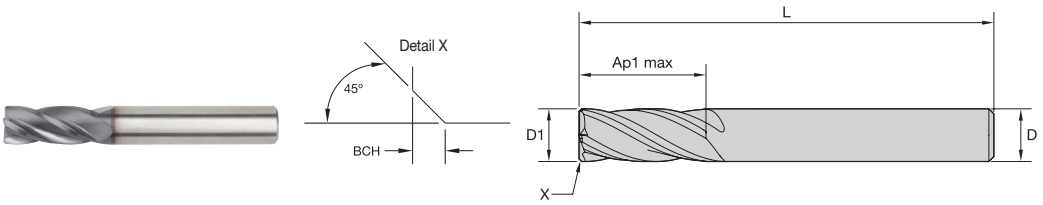
Material Group		Side Milling (A)		TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A).												
		A		Cutting Speed — vc m/min				D1 — Diameter												
		ap	ae	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
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Series D004 D014 • Metric





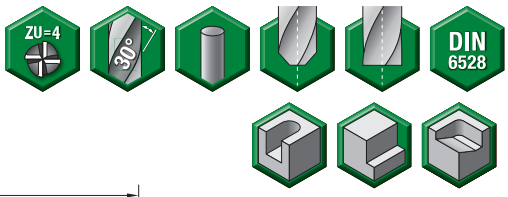
● first choice
○ alternate choice

P		●
M		●
K		●
N		
S		
H		

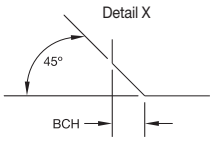
catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
D0040200T004	2,0	6	4,00	50	–	5825894
D0140200T007	2,0	6	7,00	57	–	5825895
D0140250T008	2,5	6	8,00	57	–	5825896
D0040300T005	3,0	6	5,00	50	–	5825897
D0140300T008	3,0	6	8,00	57	–	5825898
D0140350T010	3,5	6	10,00	57	–	5825899
D0040400T008S	4,0	6	8,00	54	–	6085348
D0140400T011S	4,0	6	11,00	57	–	6085349
D0140400T011	4,0	6	11,00	57	0,10	5825931
D0040500T009S	5,0	6	9,00	54	–	6085361
D0140500T013	5,0	6	13,00	57	0,10	5825934
D0140550T013S	5,5	6	13,00	57	–	6085363
D0040600T010	6,0	6	10,00	54	0,10	5825936
D0140600T013S	6,0	6	13,00	57	–	6085365
D0140600T013	6,0	6	13,00	57	0,10	5825937
D0140750T019	7,5	8	19,00	63	0,10	5825941
D0040800T012	8,0	8	12,00	58	0,20	5825942
D0140800T019S	8,0	8	19,00	63	–	6085371
D0140800T019	8,0	8	19,00	63	0,20	5825943
D0041000T014	10,0	10	14,00	66	0,20	5825946
D0141000T022S	10,0	10	22,00	72	–	6085375
D0141000T022	10,0	10	22,00	72	0,20	5825947
D0041200T016S	12,0	12	16,00	73	–	6085376
D0141200T026	12,0	12	26,00	83	0,30	5825949
D0141200W026S	12,0	12	26,00	83	–	6085397
D0041600T022	16,0	16	22,00	82	0,30	5825952
D0141600T032	16,0	16	32,00	92	0,30	5825953
D0141600W032	16,0	16	32,00	92	0,30	5825963

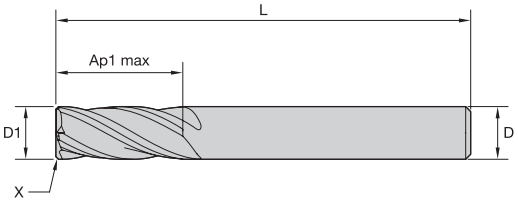
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Series 2528 • Metric







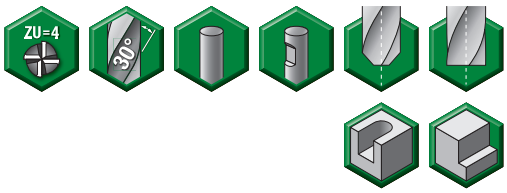


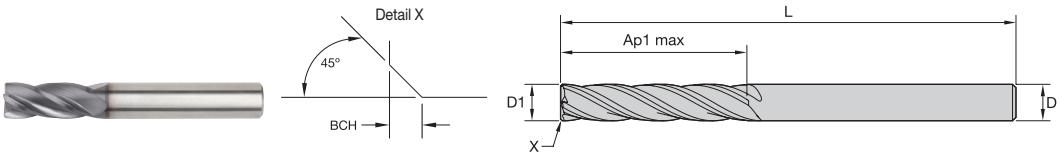
● first choice
○ alternate choice

P		●
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catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
25280800T019S	8,0	8	19,00	63	—	**6086495**
25280800T019	8,0	8	19,00	63	0,20	**5825981**
25281000T022	10,0	10	22,00	72	0,20	**5825982**

Series 4004 4014 4024 • Metric





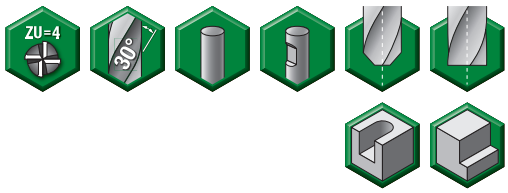
● first choice
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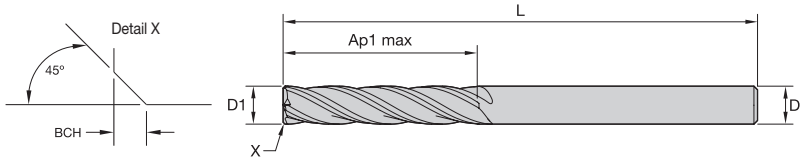
catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
40040100T004	1,0	3	4,00	38	–	5826016
40040150T004	1,5	3	4,00	38	–	5826017
40040200T006	2,0	3	6,30	38	–	5826018
40040250T006	2,5	3	6,30	38	–	5826019
40040300T009	3,0	3	9,50	38	–	5826020
40140300T019	3,0	3	19,00	63	–	5826021
40240300T025	3,0	3	25,00	75	–	5826022
40040350T012	3,5	4	12,00	50	–	5826023
40040400T011	4,0	4	11,00	50	0,10	5826024
40040400T011S	4,0	4	11,00	50	–	6085576
40140400T019S	4,0	4	19,00	63	–	6085577
40140400T019	4,0	4	19,00	63	0,10	5826025
40240400T031S	4,0	4	31,00	75	–	6085578
40240400T031	4,0	4	31,00	75	0,10	5826026
40040450T014S	4,5	5	14,00	50	–	6085579
40040450T014	4,5	5	14,00	50	0,10	5826027
40040500T013S	5,0	5	13,00	50	–	6085580
40040500T013	5,0	5	13,00	50	0,10	5826028
40040500T020S	5,0	5	20,00	63	–	6085581
40040500T020	5,0	5	20,00	63	0,10	5826029
40140500T030S	5,0	5	30,00	75	–	6085582
40140500T030	5,0	5	30,00	75	0,10	5826030
40240500T031S	5,0	5	31,00	100	–	6085583
40240500T031	5,0	5	31,00	100	0,10	5826031
40040600T016S	6,0	6	16,00	50	–	6085584
40040600T016	6,0	6	16,00	50	0,10	5826032
40140600T028S	6,0	6	28,00	75	–	6085585
40140600T028	6,0	6	28,00	75	0,10	5826033
40240600T038S	6,0	6	38,00	100	–	6085586
40240600T038	6,0	6	38,00	100	0,10	5826034
40040700T020S	7,0	8	20,00	63	–	6085587
40040700T020	7,0	8	20,00	63	0,10	5826035
40040800T021S	8,0	8	20,00	63	–	6200965
40040800T020S	8,0	8	20,00	50	–	6085588
40040800T020	8,0	8	20,00	50	0,20	5826036
40140800T028S	8,0	8	28,00	75	–	6085589
40140800T028	8,0	8	28,00	75	0,20	5826037
40240800T041S	8,0	8	41,00	100	–	6085590
40240800T041	8,0	8	41,00	100	0,20	5826038
40040900T020S	9,0	9	20,00	63	–	6085591
40040900T020	9,0	9	20,00	63	0,20	5826039
40041000T022	10,0	10	22,00	72	0,20	5826040
40041000T022S	10,0	10	22,00	72	–	6085592
40141000T032S	10,0	10	32,00	89	–	6085593
40141000T032	10,0	10	32,00	89	0,20	5826041
40241000T045S	10,0	10	45,00	100	–	6085594
40241000T045	10,0	10	45,00	100	0,20	5826042
40041200T025S	12,0	12	25,00	89	–	6085595
40041200T025	12,0	12	25,00	89	0,30	5826043
40141200T045	12,0	12	45,00	100	0,30	5826044
40141200W045S	12,0	12	45,00	100	–	6085611
40141200T045S	12,0	12	45,00	100	–	6085596
40241200T075S	12,0	12	75,00	150	–	6085597
40241200T075	12,0	12	75,00	150	0,30	5826045
40041400T032S	14,0	14	32,00	83	–	6085598
40041400T032	14,0	14	32,00	83	0,30	5826046

Series 4004 4014 4024 • Metric

(continued)





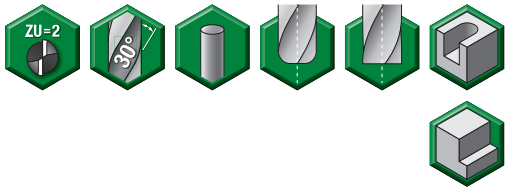


● first choice
○ alternate choice

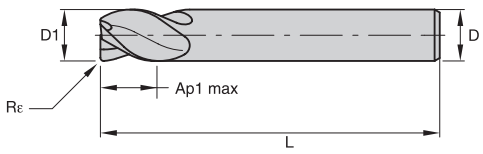
P		●
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catalogue number	D1	D	length of cut Ap1 max	length L	BCH	TIALN
40141400T050S	14,0	14	50,00	100	–	**6085599**
40141400T050	14,0	14	50,00	100	0,30	**5826047**
40241400T075S	14,0	14	75,00	150	–	**6085600**
40241400T075	14,0	14	75,00	150	0,30	**5826049**
40041600T032S	16,0	16	32,00	92	–	**6085601**
40041600T032	16,0	16	32,00	92	0,30	**5826061**
40141600T056S	16,0	16	56,00	110	–	**6085602**
40141600T056	16,0	16	56,00	110	0,30	**5826062**
40241600T075S	16,0	16	75,00	150	–	**6085603**
40241600T075	16,0	16	75,00	150	0,30	**5826063**
40041800T038S	18,0	18	38,00	100	–	**6085604**
40041800T038	18,0	18	38,00	100	0,30	**5826064**
40141800T060S	18,0	18	60,00	125	–	**6085605**
40141800T060	18,0	18	60,00	125	0,30	**5826065**
40241800T075S	18,0	18	75,00	150	–	**6085606**
40241800T075	18,0	18	75,00	150	0,30	**5826066**
40042000T038S	20,0	20	38,00	104	–	**6085607**
40042000T038	20,0	20	38,00	104	0,30	**5826067**
40142000T056	20,0	20	56,00	125	0,30	**5826068**
40142000T056S	20,0	20	56,00	125	–	**6085608**
40242000T075S	20,0	20	75,00	150	–	**6085609**
40242000T075	20,0	20	75,00	150	0,30	**5826069**
40242000W075	20,0	20	75,00	150	0,30	**5826084**

Series 4004 4014 4024 • Radius • Metric







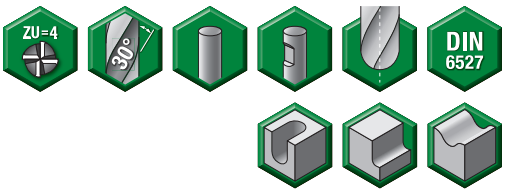
● first choice
○ alternate choice

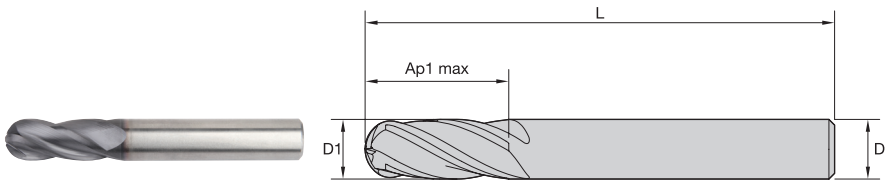
P		●
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K		●
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H		

catalogue number	D1	D	length of cut Ap1 max	length L	Rε	TIALN
40041000T022R100	10,0	10	22,00	72	1,00	**6337741**

NOTE: Refer to the NOVO™ app for the complete GP end mill offering.

Series D010 • Metric



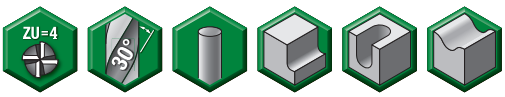


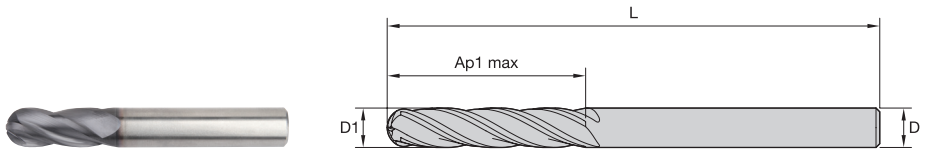
● first choice
○ alternate choice

P	●
M	●
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catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
D0100400T011	4,0	6	11,00	57	5825528
D0100500T013	5,0	6	13,00	57	5825529
D0100800T019	8,0	8	19,00	63	5825531
D0101000T022	10,0	10	22,00	72	5825532
D0101200T026	12,0	12	26,00	83	5825533

Series 4000 4010 • Metric



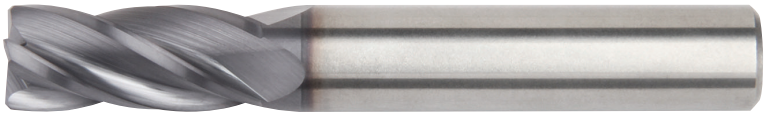


● first choice
○ alternate choice

P	●
M	●
K	●
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H	

catalogue number	D1	D	length of cut Ap1 max	length L	TIALN
40000200T006	2,0	3	6,30	38	5825555
40000300T009	3,0	3	9,50	38	6231685
40000300T020	3,0	3	20,00	75	5825556
40000400T014	4,0	4	14,00	50	5825557
40100400T025	4,0	4	25,00	75	5825558
40000500T016	5,0	5	16,00	50	5825559
40100500T030	5,0	5	30,00	75	5825560
40000600T016	6,0	6	16,00	50	5825573
40100600T019	6,0	6	19,00	63	5825574
40100600T030	6,0	6	30,00	75	5825575
40000800T019	8,0	8	19,00	63	5825576
40100800T028	8,0	8	28,00	76	6232638
40100800T040	8,0	8	40,00	100	5825577
40001000T022	10,0	10	22,00	72	5825578
40101000T032	10,0	10	32,00	89	6232639
40101000T040	10,0	10	40,00	100	5825579
40001200T025	12,0	12	25,00	75	5825580
40101200T045	12,0	12	45,00	150	5825581
40001600T032	16,0	16	32,00	89	5825585
40101600T065	16,0	16	65,00	150	5825586

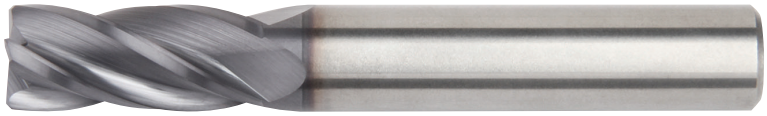
Application Data • Series D014 2528 4014 4024 • Metric



Material Group		Side Milling (A)		TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A).											
		A		Cutting Speed — vc m/min				D1 — Diameter											
		ap	ae	min		max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions.For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • 4004 Series • Metric

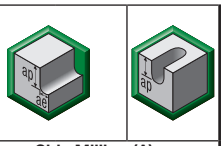


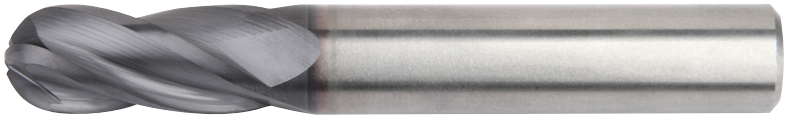
Material Group		Side Milling (A) and Slotting (B)			TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.												
		A		B	Cutting Speed — Vc m/min				D1 — Diameter												
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on greater than 12mm diameters.

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Application Data • Series 4000 4010 • Metric

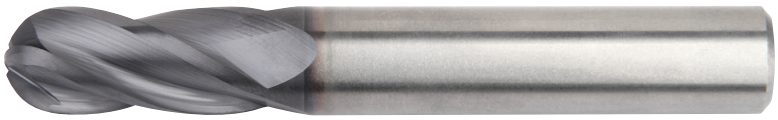




Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.										
		A		B	Cutting Speed — vc m/min				D1 — Diameter									
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
P	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
M	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
K	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

Application Data • Series D010 • Metric

Material Group		Side Milling (A)		TiAlN				Recommended feed per tooth (fz = mm/th) for side milling (A).										
		A		Cutting Speed — vc m/min				D1 — Diameter										
		ap	ae	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	1	Ap1 max	0,1 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	2	Ap1 max	0,1 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
P	3	Ap1 max	0,1 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
P	4	Ap1 max	0,1 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
M	2	Ap1 max	0,1 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
K	2	Ap1 max	0,1 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

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HOLEMAKING

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Pages C4–C43

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MODULAR DRILLS

Pages C44–C56

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VariDrill™

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TOP DRILL S™ and TOP DRILL S+™

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The VariDrill advanced-point geometry design offers the ultimate solution for multipurpose drilling operations. It offers dependable tool life in all materials due to less chipping on the cutting edge.

- Reduced chipping on cutting edge means longer tool life.
- Geometry design offers strength and versatility.
- Delivers proper surface finish across multiple materials: Steel, stainless steel, cast iron, aluminium, and high-temp alloys.

Materials:



Lengths
Available with and without through coolant channels.



Diameter Range
1–20mm

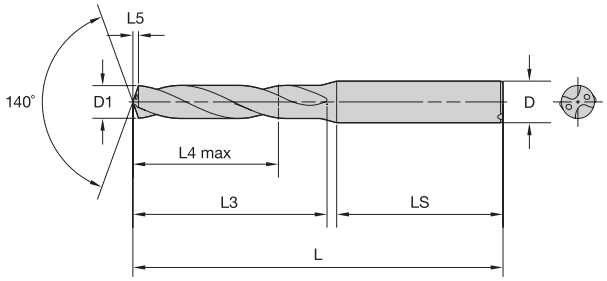


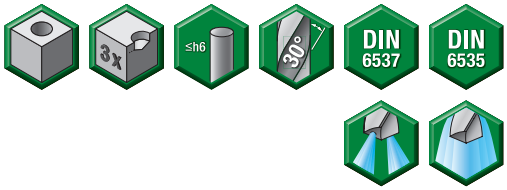
Grade:
WU25PD



VDS201A • VDS401A • 3 x D







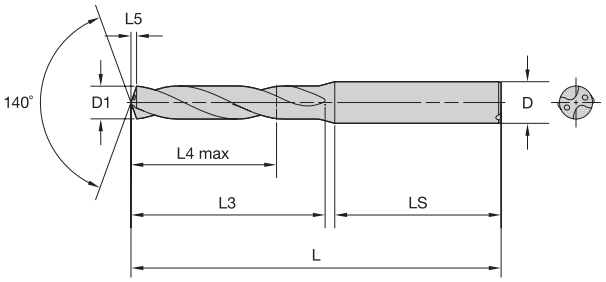
● first choice
○ alternate choice

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H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS201A01000	1,000	.0394	5	7	0,1	58	28	4	e	4144195
VDS201A01100	1,100	.0433	5	7	0,2	58	28	4	e	4144200
VDS201A01200	1,200	.0472	5	7	0,2	58	28	4	e	4144523
VDS201A01300	1,300	.0512	5	7	0,2	58	28	4	e	4144524
VDS201A01400	1,400	.0551	5	7	0,2	58	28	4	e	4144527
VDS201A01500	1,500	.0591	6	9	0,2	58	28	4	e	4144528
VDS401A01500	1,500	.0591	6	9	0,2	58	28	4	i	4140270
VDS201A01600	1,600	.0630	6	9	0,2	58	28	4	e	4144529
VDS401A01600	1,600	.0630	6	9	0,2	58	28	4	i	4140271
VDS201A01700	1,700	.0669	6	9	0,3	58	28	4	e	4144530
VDS401A01700	1,700	.0669	6	9	0,3	58	28	4	i	4140272
VDS201A01800	1,800	.0709	6	9	0,3	58	28	4	e	4144531
VDS401A01800	1,800	.0709	6	9	0,3	58	28	4	i	4140423
VDS201A01900	1,900	.0748	6	9	0,3	58	28	4	e	4144532
VDS401A01900	1,900	.0748	6	9	0,3	58	28	4	i	4140424
VDS201A01984	1,984	.0781	10	13	0,3	58	28	4	e	4144533
VDS201A02000	2,000	.0787	10	13	0,3	58	28	4	e	4144534
VDS401A02000	2,000	.0787	10	13	0,3	58	28	4	i	4140426
VDS201A02100	2,100	.0827	10	13	0,3	58	28	4	e	4144535
VDS401A02100	2,100	.0827	10	13	0,3	58	28	4	i	4140427
VDS201A02200	2,200	.0866	10	13	0,3	58	28	4	e	4144536
VDS401A02200	2,200	.0866	10	13	0,3	58	28	4	i	4140428
VDS201A02300	2,300	.0906	10	13	0,4	58	28	4	e	4144537
VDS401A02300	2,300	.0906	10	13	0,4	58	28	4	i	4140429
VDS201A02400	2,400	.0945	12	17	0,4	58	28	4	e	4144539
VDS401A02400	2,400	.0945	12	17	0,4	58	28	4	i	4140431
VDS201A02500	2,500	.0984	12	17	0,4	58	28	4	e	4144542
VDS401A02500	2,500	.0984	12	17	0,4	58	28	4	i	4140434
VDS201A02600	2,600	.1024	12	17	0,4	58	28	4	e	4144544
VDS401A02600	2,600	.1024	12	17	0,4	58	28	4	i	4140436
VDS201A02700	2,700	.1063	12	17	0,4	58	28	4	e	4144546
VDS401A02700	2,700	.1063	12	17	0,4	58	28	4	i	4140438
VDS201A02800	2,800	.1102	12	17	0,5	58	28	4	e	4144549
VDS401A02800	2,800	.1102	12	17	0,5	58	28	4	i	4140441
VDS201A02900	2,900	.1142	12	17	0,5	58	28	4	e	4144552
VDS401A02900	2,900	.1142	12	17	0,5	58	28	4	i	4140444
VDS201A02947	2,947	.1160	12	17	0,5	58	28	4	e	4144553
VDS201A03000	3,000	.1181	14	20	0,5	62	36	6	e	4143907
VDS401A03000	3,000	.1181	14	20	0,5	62	36	6	i	4140299
VDS201A03048	3,048	.1200	14	20	0,5	62	36	6	e	4143908
VDS401A03048	3,048	.1200	14	20	0,5	62	36	6	i	4140300
VDS201A03100	3,100	.1220	14	20	0,5	62	36	6	e	4143909
VDS401A03100	3,100	.1220	14	20	0,5	62	36	6	i	4140301
VDS201A03200	3,200	.1260	14	20	0,5	62	36	6	e	4143911
VDS401A03200	3,200	.1260	14	20	0,5	62	36	6	i	4140303
VDS201A03300	3,300	.1299	14	20	0,5	62	36	6	e	4143913
VDS401A03300	3,300	.1299	14	20	0,5	62	36	6	i	4140305
VDS201A03400	3,400	.1339	14	20	0,6	62	36	6	e	4143914
VDS401A03400	3,400	.1339	14	20	0,6	62	36	6	i	4140306
VDS201A03500	3,500	.1378	14	20	0,6	62	36	6	e	4143916
VDS401A03500	3,500	.1378	14	20	0,6	62	36	6	i	4140308
VDS201A03600	3,600	.1417	14	20	0,6	62	36	6	e	4143918
VDS401A03600	3,600	.1417	14	20	0,6	62	36	6	i	4140310
VDS201A03700	3,700	.1457	14	20	0,6	62	36	6	e	4143920
VDS401A03700	3,700	.1457	14	20	0,6	62	36	6	i	4140312
VDS401A03734	3,734	.1470	14	20	0,6	62	36	6	i	4140313

VDS201A • VDS401A • 3 x D

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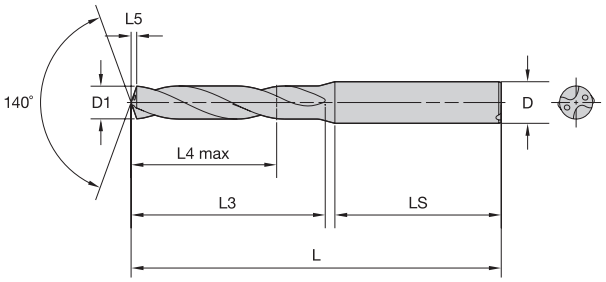
● first choice
○ alternate choice

P		●
M		●
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H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS201A03800	3,800	.1496	17	24	0,6	66	36	6	e	4143922
VDS401A03800	3,800	.1496	17	24	0,6	66	36	6	i	4140314
VDS201A03900	3,900	.1535	17	24	0,6	66	36	6	e	4143923
VDS401A03900	3,900	.1535	17	24	0,6	66	36	6	i	4140315
VDS201A04000	4,000	.1575	17	24	0,7	66	36	6	e	4143925
VDS401A04000	4,000	.1575	17	24	0,7	66	36	6	i	4140317
VDS201A04039	4,039	.1590	17	24	0,7	66	36	6	e	4143926
VDS201A04100	4,100	.1614	17	24	0,7	66	36	6	e	4143928
VDS401A04100	4,100	.1614	17	24	0,7	66	36	6	i	4140320
VDS201A04200	4,200	.1654	17	24	0,7	66	36	6	e	4143929
VDS401A04200	4,200	.1654	17	24	0,7	66	36	6	i	4140321
VDS201A04300	4,300	.1693	17	24	0,7	66	36	6	e	4143931
VDS401A04300	4,300	.1693	17	24	0,7	66	36	6	i	4140323
VDS201A04400	4,400	.1732	17	24	0,7	66	36	6	e	4143933
VDS401A04400	4,400	.1732	17	24	0,7	66	36	6	i	4140325
VDS201A04500	4,500	.1772	17	24	0,7	66	36	6	e	4143934
VDS401A04500	4,500	.1772	17	24	0,7	66	36	6	i	4140326
VDS201A04600	4,600	.1811	17	24	0,8	66	36	6	e	4143935
VDS401A04600	4,600	.1811	17	24	0,8	66	36	6	i	4140328
VDS201A04700	4,700	.1850	17	24	0,8	66	36	6	e	4143937
VDS401A04700	4,700	.1850	17	24	0,8	66	36	6	i	4140330
VDS201A04763	4,763	.1875	20	28	0,8	66	36	6	e	4143938
VDS201A04800	4,800	.1890	20	28	0,8	66	36	6	e	4143939
VDS401A04800	4,800	.1890	20	28	0,8	66	36	6	i	4140332
VDS201A04900	4,900	.1929	20	28	0,8	66	36	6	e	4143941
VDS401A04900	4,900	.1929	20	28	0,8	66	36	6	i	4140334
VDS201A05000	5,000	.1969	20	28	0,8	66	36	6	e	4143942
VDS401A05000	5,000	.1969	20	28	0,8	66	36	6	i	4140335
VDS201A05100	5,100	.2008	20	28	0,9	66	36	6	e	4143943
VDS401A05100	5,100	.2008	20	28	0,9	66	36	6	i	4140336
VDS201A05200	5,200	.2047	20	28	0,9	66	36	6	e	4143946
VDS401A05200	5,200	.2047	20	28	0,9	66	36	6	i	4140339
VDS201A05300	5,300	.2087	20	28	0,9	66	36	6	e	4143947
VDS401A05300	5,300	.2087	20	28	0,9	66	36	6	i	4140340
VDS201A05400	5,400	.2126	20	28	0,9	66	36	6	e	4143948
VDS401A05400	5,400	.2126	20	28	0,9	66	36	6	i	4140341
VDS201A05500	5,500	.2165	20	28	0,9	66	36	6	e	4143950
VDS401A05500	5,500	.2165	20	28	0,9	66	36	6	i	4140343
VDS201A05600	5,600	.2205	20	28	0,9	66	36	6	e	4143952
VDS401A05600	5,600	.2205	20	28	0,9	66	36	6	i	4140345
VDS201A05700	5,700	.2244	20	28	1,0	66	36	6	e	4143954
VDS401A05700	5,700	.2244	20	28	1,0	66	36	6	i	4140347
VDS201A05800	5,800	.2283	20	28	1,0	66	36	6	e	4143955
VDS401A05800	5,800	.2283	20	28	1,0	66	36	6	i	4140348
VDS201A05900	5,900	.2323	20	28	1,0	66	36	6	e	4143956
VDS401A05900	5,900	.2323	20	28	1,0	66	36	6	i	4140349
VDS201A06000	6,000	.2362	20	28	1,0	66	36	6	e	4143958
VDS401A06000	6,000	.2362	20	28	1,0	66	36	6	i	4140351
VDS201A06100	6,100	.2402	24	34	1,0	79	36	8	e	4143959
VDS401A06100	6,100	.2402	24	34	1,0	79	36	8	i	4140352
VDS201A06200	6,200	.2441	24	34	1,0	79	36	8	e	4143960
VDS401A06200	6,200	.2441	24	34	1,0	79	36	8	i	4140353
VDS201A06300	6,300	.2480	24	34	1,1	79	36	8	e	4143961
VDS401A06300	6,300	.2480	24	34	1,1	79	36	8	i	4140354
VDS201A06350	6,350	.2500	24	34	1,1	79	36	8	e	4143962
VDS201A06400	6,400	.2520	24	34	1,1	79	36	8	e	4143963
VDS401A06400	6,400	.2520	24	34	1,1	79	36	8	i	4140356
VDS201A06500	6,500	.2559	24	34	1,1	79	36	8	e	4143964
VDS401A06500	6,500	.2559	24	34	1,1	79	36	8	i	4140357
VDS201A06600	6,600	.2598	24	34	1,1	79	36	8	e	4143966
VDS401A06600	6,600	.2598	24	34	1,1	79	36	8	i	4140359
VDS201A06700	6,700	.2638	24	34	1,1	79	36	8	e	4143968
VDS401A06700	6,700	.2638	24	34	1,1	79	36	8	i	4140361
VDS201A06800	6,800	.2677	24	34	1,1	79	36	8	e	4143970

VDS201A • VDS401A • 3 x D

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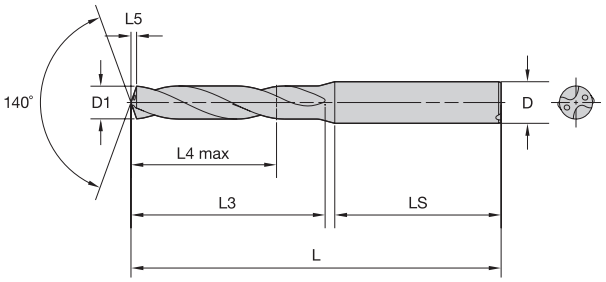
● first choice
○ alternate choice

P		●
M		●
K		●
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S		●
H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS401A06800	6,800	.2677	24	34	1,1	79	36	8	i	4140363
VDS201A06900	6,900	.2717	24	34	1,2	79	36	8	e	4143971
VDS401A06900	6,900	.2717	24	34	1,2	79	36	8	i	4140364
VDS201A07000	7,000	.2756	24	34	1,2	79	36	8	e	4143972
VDS401A07000	7,000	.2756	24	34	1,2	79	36	8	i	4140365
VDS201A07100	7,100	.2795	29	41	1,2	79	36	8	e	4143973
VDS401A07100	7,100	.2795	29	41	1,2	79	36	8	i	4140366
VDS201A07200	7,200	.2835	29	41	1,2	79	36	8	e	4143975
VDS401A07200	7,200	.2835	29	41	1,2	79	36	8	i	4140368
VDS201A07300	7,300	.2874	29	41	1,2	79	36	8	e	4143976
VDS401A07300	7,300	.2874	29	41	1,2	79	36	8	i	4140369
VDS201A07400	7,400	.2913	29	41	1,3	79	36	8	e	4143977
VDS401A07400	7,400	.2913	29	41	1,3	79	36	8	i	4140370
VDS201A07500	7,500	.2953	29	41	1,3	79	36	8	e	4143978
VDS401A07500	7,500	.2953	29	41	1,3	79	36	8	i	4140371
VDS201A07600	7,600	.2992	29	41	1,3	79	36	8	e	4143980
VDS401A07600	7,600	.2992	29	41	1,3	79	36	8	i	4140373
VDS201A07700	7,700	.3031	29	41	1,3	79	36	8	e	4143981
VDS401A07700	7,700	.3031	29	41	1,3	79	36	8	i	4140374
VDS201A07800	7,800	.3071	29	41	1,3	79	36	8	e	4143982
VDS401A07800	7,800	.3071	29	41	1,3	79	36	8	i	4140375
VDS201A07900	7,900	.3110	29	41	1,3	79	36	8	e	4143983
VDS401A07900	7,900	.3110	29	41	1,3	79	36	8	i	4140376
VDS201A07938	7,938	.3125	29	41	1,3	79	36	8	e	4143984
VDS201A08000	8,000	.3150	29	41	1,4	79	36	8	e	4143985
VDS401A08000	8,000	.3150	29	41	1,4	79	36	8	i	4140378
VDS201A08100	8,100	.3189	35	47	1,4	89	40	10	e	4143986
VDS401A08100	8,100	.3189	35	47	1,4	89	40	10	i	4140379
VDS201A08200	8,200	.3228	35	47	1,4	89	40	10	e	4143987
VDS401A08200	8,200	.3228	35	47	1,4	89	40	10	i	4140380
VDS201A08300	8,300	.3268	35	47	1,4	89	40	10	e	4143988
VDS401A08300	8,300	.3268	35	47	1,4	89	40	10	i	4140381
VDS201A08400	8,400	.3307	35	47	1,4	89	40	10	e	4143990
VDS401A08400	8,400	.3307	35	47	1,4	89	40	10	i	4140383
VDS201A08500	8,500	.3346	35	47	1,4	89	40	10	e	4143992
VDS401A08500	8,500	.3346	35	47	1,4	89	40	10	i	4140385
VDS201A08600	8,600	.3386	35	47	1,5	89	40	10	e	4143993
VDS401A08600	8,600	.3386	35	47	1,5	89	40	10	i	4140386
VDS201A08700	8,700	.3425	35	47	1,5	89	40	10	e	4143994
VDS401A08700	8,700	.3425	35	47	1,5	89	40	10	i	4140387
VDS201A08800	8,800	.3465	35	47	1,5	89	40	10	e	4143996
VDS401A08800	8,800	.3465	35	47	1,5	89	40	10	i	4140389
VDS201A08900	8,900	.3504	35	47	1,5	89	40	10	e	4143997
VDS401A08900	8,900	.3504	35	47	1,5	89	40	10	i	4140390
VDS201A09000	9,000	.3543	35	47	1,5	89	40	10	e	4143998
VDS401A09000	9,000	.3543	35	47	1,5	89	40	10	i	4140391
VDS201A09100	9,100	.3583	35	47	1,5	89	40	10	e	4143999
VDS401A09100	9,100	.3583	35	47	1,6	89	40	10	i	4140392
VDS201A09200	9,200	.3622	35	47	1,6	89	40	10	e	4144001
VDS401A09200	9,200	.3622	35	47	1,6	89	40	10	i	4140394
VDS201A09300	9,300	.3661	35	47	1,6	89	40	10	e	4144002
VDS401A09300	9,300	.3661	35	47	1,6	89	40	10	i	4140395
VDS201A09400	9,400	.3701	35	47	1,6	89	40	10	e	4144004
VDS401A09400	9,400	.3701	35	47	1,6	89	40	10	i	4140397
VDS201A09500	9,500	.3740	35	47	1,6	89	40	10	e	4144005
VDS401A09500	9,500	.3740	35	47	1,6	89	40	10	i	4140398
VDS201A09600	9,600	.3780	35	47	1,6	89	40	10	e	4144007
VDS401A09600	9,600	.3780	35	47	1,6	89	40	10	i	4140400
VDS201A09700	9,700	.3819	35	47	1,7	89	40	10	e	4144008
VDS401A09700	9,700	.3819	35	47	1,7	89	40	10	i	4140401
VDS201A09800	9,800	.3858	35	47	1,7	89	40	10	e	4144009
VDS401A09800	9,800	.3858	35	47	1,7	89	40	10	i	4140402
VDS201A09900	9,900	.3898	35	47	1,7	89	40	10	e	4144010
VDS401A09900	9,900	.3898	35	47	1,7	89	40	10	i	4140403

VDS201A • VDS401A • 3 x D

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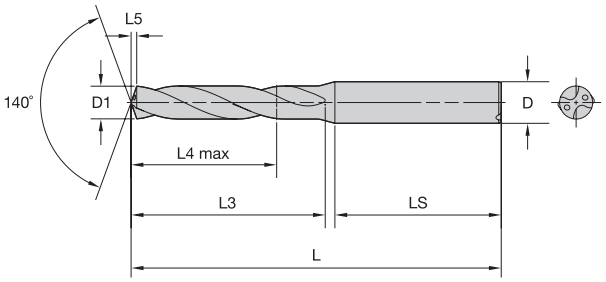
● first choice
○ alternate choice

P		●
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S		●
H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS201A10000	10,000	.3937	35	47	1,7	89	40	10	e	4144172
VDS401A10000	10,000	.3937	35	47	1,7	89	40	10	i	4140001
VDS201A10100	10,100	.3976	40	55	1,7	102	45	12	e	4144423
VDS401A10100	10,100	.3976	40	55	1,7	102	45	12	i	4140002
VDS201A10200	10,200	.4016	40	55	1,7	102	45	12	e	4144424
VDS401A10200	10,200	.4016	40	55	1,7	102	45	12	i	4140163
VDS201A10300	10,300	.4055	40	55	1,8	102	45	12	e	4144425
VDS401A10300	10,300	.4055	40	55	1,8	102	45	12	i	4140164
VDS201A10400	10,400	.4094	40	55	1,8	102	45	12	e	4144427
VDS401A10400	10,400	.4094	40	55	1,8	102	45	12	i	4140166
VDS201A10500	10,500	.4134	40	55	1,8	102	45	12	e	4144428
VDS401A10500	10,500	.4134	40	55	1,8	102	45	12	i	4140167
VDS201A10600	10,600	.4173	40	55	1,8	102	45	12	e	4144429
VDS401A10600	10,600	.4173	40	55	1,8	102	45	12	i	4140168
VDS201A10700	10,700	.4213	40	55	1,8	102	45	12	e	4144430
VDS401A10700	10,700	.4213	40	55	1,8	102	45	12	i	4140169
VDS201A10800	10,800	.4252	40	55	1,9	102	45	12	e	4144432
VDS401A10800	10,800	.4252	40	55	1,9	102	45	12	i	4140171
VDS201A10900	10,900	.4291	40	55	1,9	102	45	12	e	4144433
VDS401A10900	10,900	.4291	40	55	1,9	102	45	12	i	4140172
VDS201A11000	11,000	.4331	40	55	1,9	102	45	12	e	4144434
VDS401A11000	11,000	.4331	40	55	1,9	102	45	12	i	4140173
VDS201A11100	11,100	.4370	40	55	1,9	102	45	12	e	4144435
VDS401A11100	11,100	.4370	40	55	1,9	102	45	12	i	4140174
VDS201A11200	11,200	.4409	40	55	1,9	102	45	12	e	4144437
VDS401A11200	11,200	.4409	40	55	1,9	102	45	12	i	4140176
VDS201A11300	11,300	.4449	40	55	1,9	102	45	12	e	4144438
VDS401A11300	11,300	.4449	40	55	1,9	102	45	12	i	4140177
VDS401A11400	11,400	.4488	40	55	2,0	102	45	12	i	4140178
VDS201A11500	11,500	.4528	40	55	2,0	102	45	12	e	4144440
VDS401A11500	11,500	.4528	40	55	2,0	102	45	12	i	4140179
VDS201A11600	11,600	.4567	40	55	2,0	102	45	12	e	4144442
VDS401A11600	11,600	.4567	40	55	2,0	102	45	12	i	4140181
VDS201A11700	11,700	.4606	40	55	2,0	102	45	12	e	4144443
VDS401A11700	11,700	.4606	40	55	2,0	102	45	12	i	4140182
VDS201A11800	11,800	.4646	40	55	2,0	102	45	12	e	4144444
VDS401A11800	11,800	.4646	40	55	2,0	102	45	12	i	4140183
VDS201A11900	11,900	.4685	40	55	2,0	102	45	12	e	4144445
VDS401A11900	11,900	.4685	40	55	2,0	102	45	12	i	4140184
VDS201A12000	12,000	.4724	40	55	2,1	102	45	12	e	4144447
VDS401A12000	12,000	.4724	40	55	2,1	102	45	12	i	4140186
VDS201A12100	12,100	.4764	43	60	2,1	107	45	14	e	4144448
VDS401A12100	12,100	.4764	43	60	2,1	107	45	14	i	4140187
VDS201A12200	12,200	.4803	43	60	2,1	107	45	14	e	4144449
VDS401A12200	12,200	.4803	43	60	2,1	107	45	14	i	4140188
VDS201A12300	12,300	.4843	43	60	2,1	107	45	14	e	4144450
VDS401A12300	12,300	.4843	43	60	2,1	107	45	14	i	4140189
VDS401A12400	12,400	.4882	43	60	2,1	107	45	14	i	4140191
VDS201A12500	12,500	.4921	43	60	2,2	107	45	14	e	4144453
VDS401A12500	12,500	.4921	43	60	2,2	107	45	14	i	4140192
VDS201A12600	12,600	.4961	43	60	2,2	107	45	14	e	4144454
VDS401A12600	12,600	.4961	43	60	2,2	107	45	14	i	4140194
VDS201A12700	12,700	.5000	43	60	2,2	107	45	14	e	4144455
VDS401A12700	12,700	.5000	43	60	2,2	107	45	14	i	4140195
VDS201A12800	12,800	.5039	43	60	2,2	107	45	14	e	4144456
VDS401A12800	12,800	.5039	43	60	2,2	107	45	14	i	4140196
VDS401A12900	12,900	.5079	43	60	2,2	107	45	14	i	4140197
VDS201A13000	13,000	.5118	43	60	2,2	107	45	14	e	4144458
VDS401A13000	13,000	.5118	43	60	2,2	107	45	14	i	4140198
VDS201A13100	13,100	.5157	43	60	2,3	107	45	14	e	4144460
VDS401A13100	13,100	.5157	43	60	2,3	107	45	14	i	4140200
VDS201A13200	13,200	.5197	43	60	2,3	107	45	14	e	4144461
VDS401A13200	13,200	.5197	43	60	2,3	107	45	14	i	4140201
VDS401A13300	13,300	.5236	43	60	2,3	107	45	14	i	4140202

VDS201A • VDS401A • 3 x D

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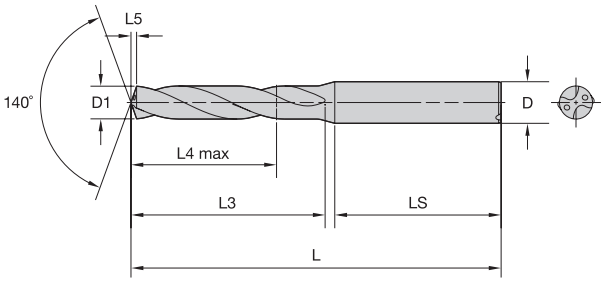
● first choice
○ alternate choice

P		●
M		●
K		●
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S		●
H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS401A13400	13,400	.5276	43	60	2,3	107	45	14	i	4140203
VDS201A13500	13,500	.5315	43	60	2,3	107	45	14	e	4144464
VDS401A13500	13,500	.5315	43	60	2,3	107	45	14	i	4140204
VDS201A13600	13,600	.5354	43	60	2,3	107	45	14	e	4144465
VDS401A13600	13,600	.5354	43	60	2,3	107	45	14	i	4140205
VDS201A13700	13,700	.5394	43	60	2,4	107	45	14	e	4144466
VDS401A13700	13,700	.5394	43	60	2,4	107	45	14	i	4140206
VDS201A13800	13,800	.5433	43	60	2,4	107	45	14	e	4144467
VDS401A13800	13,800	.5433	43	60	2,4	107	45	14	i	4140207
VDS401A13900	13,900	.5472	43	60	2,4	107	45	14	i	4140209
VDS201A14000	14,000	.5512	43	60	2,4	107	45	14	e	4144470
VDS401A14000	14,000	.5512	43	60	2,4	107	45	14	i	4140210
VDS201A14100	14,100	.5551	45	65	2,4	115	48	16	e	4144471
VDS401A14100	14,100	.5551	45	65	2,4	115	48	16	i	4140211
VDS201A14200	14,200	.5591	45	65	2,5	115	48	16	e	4144472
VDS401A14200	14,200	.5591	45	65	2,5	115	48	16	i	4140212
VDS201A14300	14,300	.5630	45	65	2,5	115	48	16	e	4144474
VDS401A14300	14,300	.5630	45	65	2,5	115	48	16	i	4140214
VDS401A14400	14,400	.5669	45	65	2,5	115	48	16	i	4140215
VDS201A14500	14,500	.5709	45	65	2,5	115	48	16	e	4144476
VDS401A14500	14,500	.5709	45	65	2,5	115	48	16	i	4140216
VDS401A14600	14,600	.5748	45	65	2,5	115	48	16	i	4140217
VDS401A14700	14,700	.5787	45	65	2,5	115	48	16	i	4140219
VDS201A14800	14,800	.5827	45	65	2,6	115	48	16	e	4144480
VDS401A14800	14,800	.5827	45	65	2,6	115	48	16	i	4140220
VDS401A14900	14,900	.5866	45	65	2,6	115	48	16	i	4140221
VDS201A15000	15,000	.5906	45	65	2,6	115	48	16	e	4144482
VDS401A15000	15,000	.5906	45	65	2,6	115	48	16	i	4140222
VDS201A15100	15,100	.5945	45	65	2,6	115	48	16	e	4144484
VDS401A15100	15,100	.5945	45	65	2,6	115	48	16	i	4140224
VDS401A15200	15,200	.5984	45	65	2,6	115	48	16	i	4140225
VDS201A15300	15,300	.6024	45	65	2,6	115	48	16	e	4144486
VDS401A15300	15,300	.6024	45	65	2,6	115	48	16	i	4140226
VDS401A15400	15,400	.6063	45	65	2,7	115	48	16	i	4140227
VDS201A15500	15,500	.6102	45	65	2,7	115	48	16	e	4144489
VDS401A15500	15,500	.6102	45	65	2,7	115	48	16	i	4140229
VDS401A15600	15,600	.6142	45	65	2,7	115	48	16	i	4140230
VDS201A15700	15,700	.6181	45	65	2,7	115	48	16	e	4144491
VDS401A15700	15,700	.6181	45	65	2,7	115	48	16	i	4140231
VDS201A15800	15,800	.6220	45	65	2,7	115	48	16	e	4144492
VDS401A15800	15,800	.6220	45	65	2,7	115	48	16	i	4140232
VDS401A15900	15,900	.6260	45	65	2,8	115	48	16	i	4140234
VDS201A16000	16,000	.6299	45	65	2,8	115	48	16	e	4144495
VDS401A16000	16,000	.6299	45	65	2,8	115	48	16	i	4140235
VDS201A16100	16,100	.6339	51	73	2,8	123	48	18	e	4144496
VDS401A16100	16,100	.6339	51	73	2,8	123	48	18	i	4140236
VDS201A16200	16,200	.6378	51	73	2,8	123	48	18	e	4144497
VDS401A16200	16,200	.6378	51	73	2,8	123	48	18	i	4140237
VDS201A16300	16,300	.6417	51	73	2,8	123	48	18	e	4144499
VDS401A16300	16,300	.6417	51	73	2,8	123	48	18	i	4140239
VDS201A16400	16,400	.6457	51	73	2,8	123	48	18	e	4144500
VDS401A16400	16,400	.6457	51	73	2,8	123	48	18	i	4140241
VDS201A16500	16,500	.6496	51	73	2,9	123	48	18	e	4144501
VDS401A16500	16,500	.6496	51	73	2,9	123	48	18	i	4140242
VDS401A16600	16,600	.6535	51	73	2,9	123	48	18	i	4140243
VDS201A16700	16,700	.6575	51	73	2,9	123	48	18	e	4144505
VDS401A16700	16,700	.6575	51	73	2,9	123	48	18	i	4140245
VDS401A16800	16,800	.6614	51	73	2,9	123	48	18	i	4140246
VDS401A16900	16,900	.6654	51	73	2,9	123	48	18	i	4140247
VDS201A17000	17,000	.6693	51	73	3,0	123	48	18	e	4144508
VDS401A17000	17,000	.6693	51	73	2,9	123	48	18	i	4140248
VDS401A17100	17,100	.6732	51	73	3,0	123	48	18	i	4140249
VDS201A17200	17,200	.6772	51	73	3,0	123	48	18	e	4144510
VDS401A17200	17,200	.6772	51	73	3,0	123	48	18	i	4140250

VDS201A • VDS401A • 3 x D

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● first choice
○ alternate choice

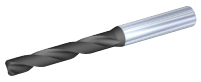
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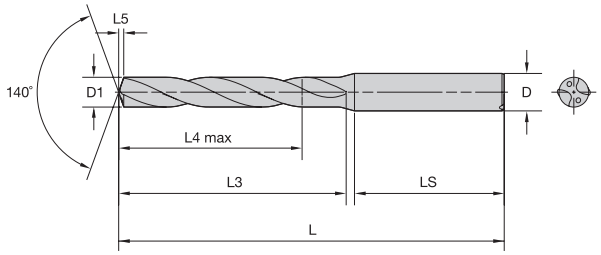
	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS401A17300	17,300	.6811	51	73	3,0	123	48	18	i	**4140251**
VDS401A17400	17,400	.6850	51	73	3,0	123	48	18	i	**4140252**
VDS201A17500	17,500	.6890	51	73	3,0	123	48	18	e	**4144514**
VDS401A17500	17,500	.6890	51	73	3,0	123	48	18	i	**4140254**
VDS401A17600	17,600	.6929	51	73	3,1	123	48	18	i	**4140255**
VDS401A17700	17,700	.6969	51	73	3,1	123	48	18	i	**4140256**
VDS201A17800	17,800	.7008	51	73	3,1	123	48	18	e	**4144517**
VDS401A17800	17,800	.7008	51	73	3,1	123	48	18	i	**4140257**
VDS201A18000	18,000	.7087	51	73	3,1	123	48	18	e	**4144590**
VDS401A18000	18,000	.7087	51	73	3,1	123	48	18	i	**4140449**
VDS201A18100	18,100	.7126	55	79	3,1	131	50	20	e	**4144591**
VDS401A18100	18,100	.7126	55	79	3,1	131	50	20	i	**4140450**
VDS201A18200	18,200	.7165	55	79	3,2	131	50	20	e	**4144592**
VDS401A18200	18,200	.7165	55	79	3,2	131	50	20	i	**4140451**
VDS401A18300	18,300	.7205	55	79	3,2	131	50	20	i	**4140463**
VDS401A18400	18,400	.7244	55	79	3,2	131	50	20	i	**4140464**
VDS201A18500	18,500	.7283	55	79	3,2	131	50	20	e	**4144596**
VDS401A18500	18,500	.7283	55	79	3,2	131	50	20	i	**4140465**
VDS201A18600	18,600	.7323	55	79	3,2	131	50	20	e	**4144597**
VDS401A18600	18,600	.7323	55	79	3,2	131	50	20	i	**4140466**
VDS401A18700	18,700	.7362	55	79	3,2	131	50	20	i	**4140468**
VDS401A18800	18,800	.7402	55	79	3,3	131	50	20	i	**4140469**
VDS401A18900	18,900	.7441	55	79	3,3	131	50	20	i	**4140470**
VDS201A19000	19,000	.7480	55	79	3,3	131	50	20	e	**4144602**
VDS401A19000	19,000	.7480	55	79	3,3	131	50	20	i	**4140471**
VDS201A19100	19,100	.7520	55	79	3,3	131	50	20	e	**4144604**
VDS401A19100	19,100	.7520	55	79	3,3	131	50	20	i	**4140473**
VDS401A19200	19,200	.7559	55	79	3,3	131	50	20	i	**4140474**
VDS401A19300	19,300	.7598	55	79	3,4	131	50	20	i	**4140475**
VDS401A19400	19,400	.7638	55	79	3,4	131	50	20	i	**4140476**
VDS401A19500	19,500	.7677	55	79	3,4	131	50	20	i	**4140477**
VDS401A19600	19,600	.7717	55	79	3,4	131	50	20	i	**4140478**
VDS401A19700	19,700	.7756	55	79	3,4	131	50	20	i	**4140479**
VDS401A19800	19,800	.7795	55	79	3,4	131	50	20	i	**4140480**
VDS401A19900	19,900	.7835	55	79	3,5	131	50	20	i	**4140481**
VDS201A20000	20,000	.7874	55	79	3,5	131	50	20	e	**4144613**
VDS401A20000	20,000	.7874	55	79	3,5	131	50	20	i	**4140482**

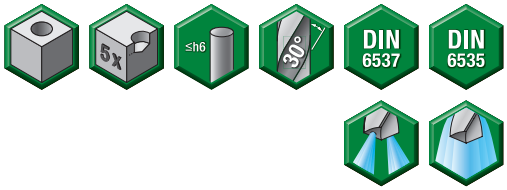
NOTE: CF = Coolant Feature:
i = internal
e = external
i/e = internal and external

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

VDS202A • VDS402A • 5 x D







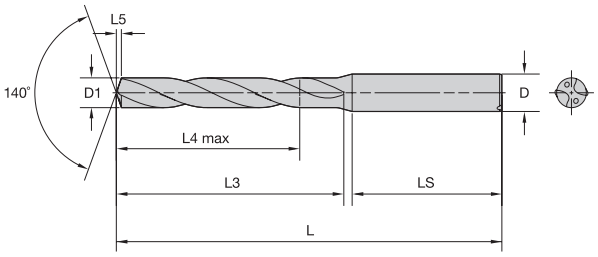
● first choice
○ alternate choice

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	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS202A01000	1,000	.0394	6	9	0,1	58	28	4	e	4148000
VDS202A01100	1,100	.0433	6	9	0,2	58	28	4	e	4148005
VDS202A01200	1,200	.0472	6	9	0,2	58	28	4	e	4148008
VDS202A01300	1,300	.0512	6	9	0,2	58	28	4	e	4148009
VDS202A01400	1,400	.0551	6	9	0,2	58	28	4	e	4148012
VDS202A01500	1,500	.0591	9	12	0,2	58	28	4	e	4148013
VDS402A01500	1,500	.0591	9	12	0,2	58	28	4	i	4142871
VDS202A01600	1,600	.0630	9	12	0,2	58	28	4	e	4148014
VDS402A01600	1,600	.0630	9	12	0,2	58	28	4	i	4142884
VDS202A01700	1,700	.0669	9	12	0,3	58	28	4	e	4148015
VDS402A01700	1,700	.0669	9	12	0,3	58	28	4	i	4142887
VDS202A01800	1,800	.0709	9	12	0,3	58	28	4	e	4148016
VDS402A01800	1,800	.0709	9	12	0,3	58	28	4	i	4142890
VDS202A01900	1,900	.0748	9	12	0,3	58	28	4	e	4148017
VDS402A01900	1,900	.0748	9	12	0,3	58	28	4	i	4142893
VDS202A02000	2,000	.0787	14	18	0,3	58	28	4	e	4148019
VDS402A02000	2,000	.0787	14	18	0,3	58	28	4	i	4142899
VDS202A02100	2,100	.0827	14	18	0,3	58	28	4	e	4148020
VDS402A02100	2,100	.0827	14	18	0,3	58	28	4	i	4142902
VDS202A02200	2,200	.0866	14	18	0,3	58	28	4	e	4148021
VDS402A02200	2,200	.0866	14	18	0,3	58	28	4	i	4142905
VDS202A02300	2,300	.0906	14	18	0,4	58	28	4	e	4148022
VDS402A02300	2,300	.0906	14	18	0,4	58	28	4	i	4142908
VDS202A02400	2,400	.0945	17	22	0,4	58	28	4	e	4148024
VDS402A02400	2,400	.0945	17	22	0,4	58	28	4	i	4142924
VDS202A02500	2,500	.0984	17	22	0,4	58	28	4	e	4148027
VDS402A02500	2,500	.0984	17	22	0,4	58	28	4	i	4142933
VDS202A02600	2,600	.1024	17	22	0,4	58	28	4	e	4148029
VDS402A02600	2,600	.1024	17	22	0,4	58	28	4	i	4142939
VDS202A02700	2,700	.1063	17	22	0,4	58	28	4	e	4148031
VDS402A02700	2,700	.1063	17	22	0,4	58	28	4	i	4142945
VDS202A02800	2,800	.1102	17	22	0,5	58	28	4	e	4148034
VDS402A02800	2,800	.1102	17	22	0,5	58	28	4	i	4142964
VDS202A02900	2,900	.1142	17	22	0,5	58	28	4	e	4148037
VDS402A02900	2,900	.1142	17	22	0,5	58	28	4	i	4142973
VDS402A02947	2,947	.1160	17	22	0,5	58	28	4	i	4142976
VDS202A03000	3,000	.1181	23	28	0,5	66	36	6	e	4148142
VDS402A03000	3,000	.1181	23	28	0,5	66	36	6	i	4142844
VDS402A03048	3,048	.1200	23	28	0,5	66	36	6	i	4142846
VDS202A03100	3,100	.1220	23	28	0,5	66	36	6	e	4148144
VDS402A03100	3,100	.1220	23	28	0,5	66	36	6	i	4142847
VDS202A03200	3,200	.1260	23	28	0,5	66	36	6	e	4148146
VDS402A03200	3,200	.1260	23	28	0,5	66	36	6	i	4142851
VDS202A03300	3,300	.1299	23	28	0,5	66	36	6	e	4148148
VDS402A03300	3,300	.1299	23	28	0,5	66	36	6	i	4142865
VDS202A03400	3,400	.1339	23	28	0,6	66	36	6	e	4148149
VDS402A03400	3,400	.1339	23	28	0,6	66	36	6	i	4142867
VDS202A03500	3,500	.1378	23	28	0,6	66	36	6	e	4148151
VDS402A03500	3,500	.1378	23	28	0,6	66	36	6	i	4142872
VDS202A03600	3,600	.1417	23	28	0,6	66	36	6	e	4148153
VDS402A03600	3,600	.1417	23	28	0,6	66	36	6	i	4142888
VDS202A03700	3,700	.1457	23	28	0,6	66	36	6	e	4148155
VDS402A03700	3,700	.1457	23	28	0,6	66	36	6	i	4142894
VDS202A03800	3,800	.1496	29	36	0,6	74	36	6	e	4148157
VDS402A03800	3,800	.1496	29	36	0,6	74	36	6	i	4142900
VDS202A03900	3,900	.1535	29	36	0,6	74	36	6	e	4148158

VDS202A • VDS402A • 5 x D

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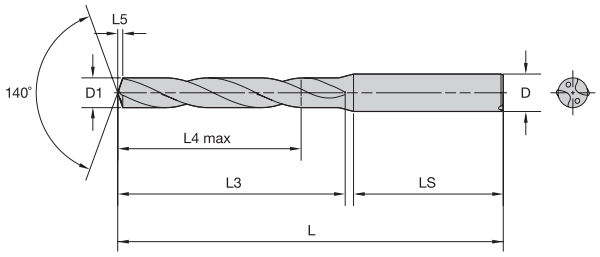
● first choice
○ alternate choice

P		●
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S		●
H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS402A03900	3,900	.1535	29	36	0,6	74	36	6	i	4142903
VDS202A04000	4,000	.1575	29	36	0,7	74	36	6	e	4148160
VDS402A04000	4,000	.1575	29	36	0,7	74	36	6	i	4142909
VDS202A04100	4,100	.1614	29	36	0,7	74	36	6	e	4148163
VDS402A04100	4,100	.1614	29	36	0,7	74	36	6	i	4142928
VDS202A04200	4,200	.1654	29	36	0,7	74	36	6	e	4148164
VDS402A04200	4,200	.1654	29	36	0,7	74	36	6	i	4142931
VDS202A04300	4,300	.1693	29	36	0,7	74	36	6	e	4148166
VDS402A04300	4,300	.1693	29	36	0,7	74	36	6	i	4142937
VDS202A04400	4,400	.1732	29	36	0,7	74	36	6	e	4148168
VDS402A04400	4,400	.1732	29	36	0,7	74	36	6	i	4142943
VDS202A04500	4,500	.1772	29	36	0,7	74	36	6	e	4148169
VDS402A04500	4,500	.1772	29	36	0,7	74	36	6	i	4142946
VDS202A04600	4,600	.1811	29	36	0,8	74	36	6	e	4148170
VDS402A04600	4,600	.1811	29	36	0,8	74	36	6	i	4142949
VDS402A04623	4,623	.1820	29	36	0,8	74	36	6	i	4142952
VDS202A04700	4,700	.1850	29	36	0,8	74	36	6	e	4148172
VDS402A04700	4,700	.1850	29	36	0,8	74	36	6	i	4142965
VDS202A04800	4,800	.1890	35	44	0,8	82	36	6	e	4148174
VDS402A04800	4,800	.1890	35	44	0,8	82	36	6	i	4142971
VDS202A04900	4,900	.1929	35	44	0,8	82	36	6	e	4148176
VDS402A04900	4,900	.1929	35	44	0,8	82	36	6	i	4142977
VDS202A05000	5,000	.1969	35	44	0,8	82	36	6	e	4148177
VDS402A05000	5,000	.1969	35	44	0,8	82	36	6	i	4142979
VDS202A05100	5,100	.2008	35	44	0,9	82	36	6	e	4148178
VDS402A05100	5,100	.2008	35	44	0,9	82	36	6	i	4142981
VDS202A05200	5,200	.2047	35	44	0,9	82	36	6	e	4148181
VDS402A05200	5,200	.2047	35	44	0,9	82	36	6	i	4142997
VDS202A05300	5,300	.2087	35	44	0,9	82	36	6	e	4148182
VDS402A05300	5,300	.2087	35	44	0,9	82	36	6	i	4142999
VDS202A05400	5,400	.2126	35	44	0,9	82	36	6	e	4148183
VDS402A05400	5,400	.2126	35	44	0,9	82	36	6	i	4143000
VDS202A05500	5,500	.2165	35	44	0,9	82	36	6	e	4148185
VDS402A05500	5,500	.2165	35	44	0,9	82	36	6	i	4143002
VDS402A05558	5,558	.2188	35	44	0,9	82	36	6	i	4143003
VDS202A05600	5,600	.2205	35	44	0,9	82	36	6	e	4148187
VDS402A05600	5,600	.2205	35	44	0,9	82	36	6	i	4143004
VDS202A05700	5,700	.2244	35	44	1,0	82	36	6	e	4148189
VDS402A05700	5,700	.2244	35	44	1,0	82	36	6	i	4143006
VDS202A05800	5,800	.2283	35	44	1,0	82	36	6	e	4148190
VDS402A05800	5,800	.2283	35	44	1,0	82	36	6	i	4143007
VDS202A05900	5,900	.2323	35	44	1,0	82	36	6	e	4148191
VDS402A05900	5,900	.2323	35	44	1,0	82	36	6	i	4143008
VDS202A06000	6,000	.2362	35	44	1,0	82	36	6	e	4148193
VDS402A06000	6,000	.2362	35	44	1,0	82	36	6	i	4143010
VDS202A06100	6,100	.2402	43	53	1,0	91	36	8	e	4148194
VDS402A06100	6,100	.2402	43	53	1,0	91	36	8	i	4143011
VDS202A06200	6,200	.2441	43	53	1,0	91	36	8	e	4148195
VDS402A06200	6,200	.2441	43	53	1,0	91	36	8	i	4143012
VDS202A06300	6,300	.2480	43	53	1,1	91	36	8	e	4148196
VDS402A06300	6,300	.2480	43	53	1,1	91	36	8	i	4143023
VDS202A06400	6,400	.2520	43	53	1,1	91	36	8	e	4148198
VDS402A06400	6,400	.2520	43	53	1,1	91	36	8	i	4143025
VDS202A06500	6,500	.2559	43	53	1,1	91	36	8	e	4148199
VDS402A06500	6,500	.2559	43	53	1,1	91	36	8	i	4143026
VDS202A06600	6,600	.2598	43	53	1,1	91	36	8	e	4148201
VDS402A06600	6,600	.2598	43	53	1,1	91	36	8	i	4143028
VDS202A06700	6,700	.2638	43	53	1,1	91	36	8	e	4148203
VDS402A06700	6,700	.2638	43	53	1,1	91	36	8	i	4143030
VDS202A06800	6,800	.2677	43	53	1,1	91	36	8	e	4148205
VDS402A06800	6,800	.2677	43	53	1,1	91	36	8	i	4143032
VDS202A06900	6,900	.2717	43	53	1,2	91	36	8	e	4148206
VDS402A06900	6,900	.2717	43	53	1,2	91	36	8	i	4143043
VDS202A07000	7,000	.2756	43	53	1,2	91	36	8	e	4148207

VDS202A • VDS402A • 5 x D

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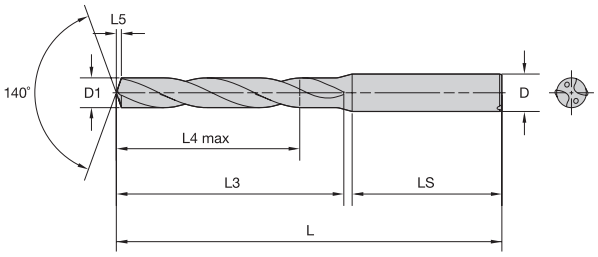
● first choice
○ alternate choice

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	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS402A07000	7,000	.2756	43	53	1,2	91	36	8	i	4143044
VDS202A07100	7,100	.2795	43	53	1,2	91	36	8	e	4148208
VDS402A07100	7,100	.2795	43	53	1,2	91	36	8	i	4143045
VDS202A07200	7,200	.2835	43	53	1,2	91	36	8	e	4148210
VDS402A07200	7,200	.2835	43	53	1,2	91	36	8	i	4143047
VDS202A07300	7,300	.2874	43	53	1,2	91	36	8	e	4148211
VDS402A07300	7,300	.2874	43	53	1,2	91	36	8	i	4143048
VDS202A07400	7,400	.2913	43	53	1,3	91	36	8	e	4148212
VDS402A07400	7,400	.2913	43	53	1,3	91	36	8	i	4143049
VDS202A07500	7,500	.2953	43	53	1,3	91	36	8	e	4148213
VDS402A07500	7,500	.2953	43	53	1,3	91	36	8	i	4143050
VDS202A07600	7,600	.2992	43	53	1,3	91	36	8	e	4148215
VDS402A07600	7,600	.2992	43	53	1,3	91	36	8	i	4143052
VDS202A07700	7,700	.3031	43	53	1,3	91	36	8	e	4148216
VDS402A07700	7,700	.3031	43	53	1,3	91	36	8	i	4143063
VDS202A07800	7,800	.3071	43	53	1,3	91	36	8	e	4148217
VDS402A07800	7,800	.3071	43	53	1,3	91	36	8	i	4143064
VDS202A07900	7,900	.3110	43	53	1,3	91	36	8	e	4148218
VDS402A07900	7,900	.3110	43	53	1,3	91	36	8	i	4143065
VDS202A08000	8,000	.3150	43	53	1,4	91	36	8	e	4148220
VDS402A08000	8,000	.3150	43	53	1,4	91	36	8	i	4143067
VDS202A08100	8,100	.3189	49	61	1,4	103	40	10	e	4148221
VDS402A08100	8,100	.3189	49	61	1,4	103	40	10	i	4143068
VDS202A08200	8,200	.3228	49	61	1,4	103	40	10	e	4148222
VDS402A08200	8,200	.3228	49	61	1,4	103	40	10	i	4143069
VDS202A08300	8,300	.3268	49	61	1,4	103	40	10	e	4148223
VDS402A08300	8,300	.3268	49	61	1,4	103	40	10	i	4143070
VDS202A08400	8,400	.3307	49	61	1,4	103	40	10	e	4148225
VDS402A08400	8,400	.3307	49	61	1,4	103	40	10	i	4143072
VDS202A08500	8,500	.3346	49	61	1,4	103	40	10	e	4148227
VDS402A08500	8,500	.3346	49	61	1,4	103	40	10	i	4143084
VDS202A08600	8,600	.3386	49	61	1,5	103	40	10	e	4148228
VDS402A08600	8,600	.3386	49	61	1,5	103	40	10	i	4143085
VDS202A08700	8,700	.3425	49	61	1,5	103	40	10	e	4148229
VDS402A08700	8,700	.3425	49	61	1,5	103	40	10	i	4143086
VDS202A08800	8,800	.3465	49	61	1,5	103	40	10	e	4148231
VDS402A08800	8,800	.3465	49	61	1,5	103	40	10	i	4143088
VDS202A08900	8,900	.3504	49	61	1,5	103	40	10	e	4148232
VDS402A08900	8,900	.3504	49	61	1,5	103	40	10	i	4143089
VDS202A09000	9,000	.3543	49	61	1,5	103	40	10	e	4148233
VDS402A09000	9,000	.3543	49	61	1,5	103	40	10	i	4143090
VDS202A09100	9,100	.3583	49	61	1,6	103	40	10	e	4148234
VDS402A09100	9,100	.3583	49	61	1,5	103	40	10	i	4143091
VDS202A09200	9,200	.3622	49	61	1,6	103	40	10	e	4148236
VDS402A09200	9,200	.3622	49	61	1,6	103	40	10	i	4143103
VDS202A09300	9,300	.3661	49	61	1,6	103	40	10	e	4148237
VDS402A09300	9,300	.3661	49	61	1,6	103	40	10	i	4143104
VDS202A09400	9,400	.3701	49	61	1,6	103	40	10	e	4148239
VDS402A09400	9,400	.3701	49	61	1,6	103	40	10	i	4143106
VDS202A09500	9,500	.3740	49	61	1,6	103	40	10	e	4148240
VDS402A09500	9,500	.3740	49	61	1,6	103	40	10	i	4143107
VDS402A09600	9,600	.3780	49	61	1,6	103	40	10	i	4143109
VDS202A09700	9,700	.3819	49	61	1,7	103	40	10	e	4148243
VDS402A09700	9,700	.3819	49	61	1,7	103	40	10	i	4143110
VDS202A09800	9,800	.3858	49	61	1,7	103	40	10	e	4148244
VDS402A09800	9,800	.3858	49	61	1,7	103	40	10	i	4143111
VDS202A09900	9,900	.3898	49	61	1,7	103	40	10	e	4148245
VDS402A09900	9,900	.3898	49	61	1,7	103	40	10	i	4143112
VDS202A10000	10,000	.3937	49	61	1,7	103	40	10	e	4148258
VDS402A10000	10,000	.3937	49	61	1,7	103	40	10	i	4142823
VDS202A10100	10,100	.3976	56	71	1,7	118	45	12	e	4148259
VDS402A10100	10,100	.3976	56	71	1,7	118	45	12	i	4142825
VDS202A10200	10,200	.4016	56	71	1,7	118	45	12	e	4148260
VDS402A10200	10,200	.4016	56	71	1,7	118	45	12	i	4142827

VDS202A • VDS402A • 5 x D

(continued)



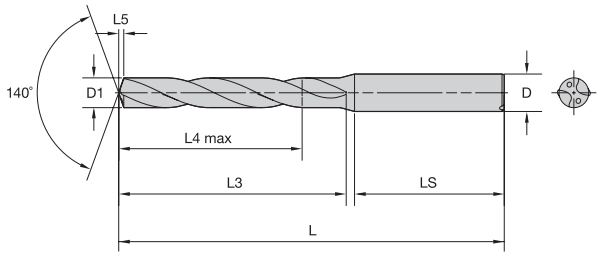
● first choice
○ alternate choice

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	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS202A10300	10,300	.4055	56	71	1,8	118	45	12	e	4148261
VDS402A10300	10,300	.4055	56	71	1,8	118	45	12	i	4142829
VDS402A10400	10,400	.4094	56	71	1,8	118	45	12	i	4142832
VDS202A10500	10,500	.4134	56	71	1,8	118	45	12	e	4148284
VDS402A10500	10,500	.4134	56	71	1,8	118	45	12	i	4142834
VDS202A10600	10,600	.4173	56	71	1,8	118	45	12	e	4148285
VDS402A10600	10,600	.4173	56	71	1,8	118	45	12	i	4142836
VDS202A10700	10,700	.4213	56	71	1,8	118	45	12	e	4148286
VDS402A10700	10,700	.4213	56	71	1,8	118	45	12	i	4142838
VDS202A10800	10,800	.4252	56	71	1,9	118	45	12	e	4148288
VDS402A10800	10,800	.4252	56	71	1,9	118	45	12	i	4142842
VDS202A10900	10,900	.4291	56	71	1,9	118	45	12	e	4148289
VDS402A10900	10,900	.4291	56	71	1,9	118	45	12	i	4142855
VDS202A11000	11,000	.4331	56	71	1,9	118	45	12	e	4148290
VDS402A11000	11,000	.4331	56	71	1,9	118	45	12	i	4142857
VDS202A11100	11,100	.4370	56	71	1,9	118	45	12	e	4148291
VDS402A11100	11,100	.4370	56	71	1,9	118	45	12	i	4142858
VDS202A11200	11,200	.4409	56	71	1,9	118	45	12	e	4148293
VDS402A11200	11,200	.4409	56	71	1,9	118	45	12	i	4142862
VDS202A11300	11,300	.4449	56	71	1,9	118	45	12	e	4148294
VDS402A11300	11,300	.4449	56	71	1,9	118	45	12	i	4142873
VDS402A11400	11,400	.4488	56	71	2,0	118	45	12	i	4142874
VDS202A11500	11,500	.4528	56	71	2,0	118	45	12	e	4148296
VDS402A11500	11,500	.4528	56	71	2,0	118	45	12	i	4142875
VDS202A11600	11,600	.4567	56	71	2,0	118	45	12	e	4148298
VDS402A11600	11,600	.4567	56	71	2,0	118	45	12	i	4142877
VDS202A11700	11,700	.4606	56	71	2,0	118	45	12	e	4148299
VDS402A11700	11,700	.4606	56	71	2,0	118	45	12	i	4142878
VDS202A11800	11,800	.4646	56	71	2,0	118	45	12	e	4148300
VDS402A11800	11,800	.4646	56	71	2,0	118	45	12	i	4142879
VDS202A11900	11,900	.4685	56	71	2,0	118	45	12	e	4148301
VDS402A11900	11,900	.4685	56	71	2,0	118	45	12	i	4142880
VDS202A12000	12,000	.4724	56	71	2,1	118	45	12	e	4148313
VDS402A12000	12,000	.4724	56	71	2,1	118	45	12	i	4142882
VDS202A12100	12,100	.4764	60	77	2,1	124	45	14	e	4148314
VDS402A12100	12,100	.4764	60	77	2,1	124	45	14	i	4142913
VDS202A12200	12,200	.4803	60	77	2,1	124	45	14	e	4148315
VDS402A12200	12,200	.4803	60	77	2,1	124	45	14	i	4142914
VDS402A12300	12,300	.4843	60	77	2,1	124	45	14	i	4142915
VDS402A12400	12,400	.4882	60	77	2,1	124	45	14	i	4142917
VDS202A12500	12,500	.4921	60	77	2,2	124	45	14	e	4148319
VDS402A12500	12,500	.4921	60	77	2,2	124	45	14	i	4142918
VDS202A12600	12,600	.4961	60	77	2,2	124	45	14	e	4148320
VDS402A12600	12,600	.4961	60	77	2,2	124	45	14	i	4142919
VDS202A12700	12,700	.5000	60	77	2,2	124	45	14	e	4148321
VDS402A12700	12,700	.5000	60	77	2,2	124	45	14	i	4142920
VDS202A12800	12,800	.5039	60	77	2,2	124	45	14	e	4148322
VDS402A12800	12,800	.5039	60	77	2,2	124	45	14	i	4142921
VDS202A12900	12,900	.5079	60	77	2,2	124	45	14	e	4148343
VDS402A12900	12,900	.5079	60	77	2,2	124	45	14	i	4142922
VDS202A13000	13,000	.5118	60	77	2,2	124	45	14	e	4148344
VDS402A13000	13,000	.5118	60	77	2,2	124	45	14	i	4142953
VDS202A13100	13,100	.5157	60	77	2,3	124	45	14	e	4148346
VDS402A13100	13,100	.5157	60	77	2,3	124	45	14	i	4142955
VDS202A13200	13,200	.5197	60	77	2,3	124	45	14	e	4148347
VDS402A13200	13,200	.5197	60	77	2,3	124	45	14	i	4142956
VDS402A13300	13,300	.5236	60	77	2,3	124	45	14	i	4142957
VDS402A13400	13,400	.5276	60	77	2,3	124	45	14	i	4142958
VDS202A13500	13,500	.5315	60	77	2,3	124	45	14	e	4148350
VDS402A13500	13,500	.5315	60	77	2,3	124	45	14	i	4142959
VDS402A13600	13,600	.5354	60	77	2,3	124	45	14	i	4142960
VDS402A13700	13,700	.5394	60	77	2,4	124	45	14	i	4142961
VDS202A13800	13,800	.5433	60	77	2,4	124	45	14	e	4148353
VDS402A13800	13,800	.5433	60	77	2,4	124	45	14	i	4142962

VDS202A • VDS402A • 5 x D

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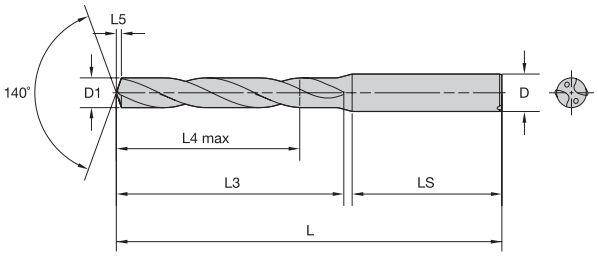
● first choice
○ alternate choice

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	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS402A13900	13,900	.5472	60	77	2,4	124	45	14	i	**4142984**
VDS202A14000	14,000	.5512	60	77	2,4	124	45	14	e	**4148356**
VDS402A14000	14,000	.5512	60	77	2,4	124	45	14	i	**4142985**
VDS202A14100	14,100	.5551	63	83	2,4	133	48	16	e	**4148357**
VDS402A14100	14,100	.5551	63	83	2,4	133	48	16	i	**4142986**
VDS202A14200	14,200	.5591	63	83	2,5	133	48	16	e	**4148358**
VDS402A14200	14,200	.5591	63	83	2,5	133	48	16	i	**4142987**
VDS202A14300	14,300	.5630	63	83	2,5	133	48	16	e	**4148360**
VDS402A14300	14,300	.5630	63	83	2,5	133	48	16	i	**4142989**
VDS402A14400	14,400	.5669	63	83	2,5	133	48	16	i	**4142990**
VDS202A14500	14,500	.5709	63	83	2,5	133	48	16	e	**4148362**
VDS402A14500	14,500	.5709	63	83	2,5	133	48	16	i	**4142991**
VDS402A14600	14,600	.5748	63	83	2,5	133	48	16	i	**4142992**
VDS402A14700	14,700	.5787	63	83	2,5	133	48	16	i	**4143014**
VDS202A14800	14,800	.5827	63	83	2,6	133	48	16	e	**4148366**
VDS402A14800	14,800	.5827	63	83	2,6	133	48	16	i	**4143015**
VDS202A14900	14,900	.5866	63	83	2,6	133	48	16	e	**4148367**
VDS402A14900	14,900	.5866	63	83	2,6	133	48	16	i	**4143016**
VDS202A15000	15,000	.5906	63	83	2,6	133	48	16	e	**4148368**
VDS402A15000	15,000	.5906	63	83	2,6	133	48	16	i	**4143017**
VDS202A15100	15,100	.5945	63	83	2,6	133	48	16	e	**4148370**
VDS402A15100	15,100	.5945	63	83	2,6	133	48	16	i	**4143019**
VDS202A15200	15,200	.5984	63	83	2,6	133	48	16	e	**4148371**
VDS402A15200	15,200	.5984	63	83	2,6	133	48	16	i	**4143020**
VDS402A15300	15,300	.6024	63	83	2,6	133	48	16	i	**4143021**
VDS402A15400	15,400	.6063	63	83	2,7	133	48	16	i	**4143022**
VDS202A15500	15,500	.6102	63	83	2,7	133	48	16	e	**4148375**
VDS402A15500	15,500	.6102	63	83	2,7	133	48	16	i	**4143034**
VDS402A15600	15,600	.6142	63	83	2,7	133	48	16	i	**4143035**
VDS402A15700	15,700	.6181	63	83	2,7	133	48	16	i	**4143036**
VDS202A15800	15,800	.6220	63	83	2,7	133	48	16	e	**4148378**
VDS402A15800	15,800	.6220	63	83	2,7	133	48	16	i	**4143037**
VDS402A15900	15,900	.6260	63	83	2,8	133	48	16	i	**4143039**
VDS202A16000	16,000	.6299	63	83	2,8	133	48	16	e	**4148381**
VDS402A16000	16,000	.6299	63	83	2,8	133	48	16	i	**4143040**
VDS202A16100	16,100	.6339	71	93	2,8	143	48	18	e	**4148382**
VDS402A16100	16,100	.6339	71	93	2,8	143	48	18	i	**4143041**
VDS402A16200	16,200	.6378	71	93	2,8	143	48	18	i	**4143042**
VDS402A16300	16,300	.6417	71	93	2,8	143	48	18	i	**4143054**
VDS402A16400	16,400	.6457	71	93	2,8	143	48	18	i	**4143055**
VDS202A16500	16,500	.6496	71	93	2,9	143	48	18	e	**4148387**
VDS402A16500	16,500	.6496	71	93	2,9	143	48	18	i	**4143056**
VDS402A16600	16,600	.6535	71	93	2,9	143	48	18	i	**4143057**
VDS402A16700	16,700	.6575	71	93	2,9	143	48	18	i	**4143059**
VDS402A16800	16,800	.6614	71	93	2,9	143	48	18	i	**4143060**
VDS402A16900	16,900	.6654	71	93	2,9	143	48	18	i	**4143061**
VDS202A17000	17,000	.6693	71	93	3,0	143	48	18	e	**4148393**
VDS402A17000	17,000	.6693	71	93	3,0	143	48	18	i	**4143062**
VDS202A17100	17,100	.6732	71	93	3,0	143	48	18	e	**4148394**
VDS402A17100	17,100	.6732	71	93	3,0	143	48	18	i	**4143073**
VDS402A17200	17,200	.6772	71	93	3,0	143	48	18	i	**4143074**
VDS402A17300	17,300	.6811	71	93	3,0	143	48	18	i	**4143075**
VDS402A17400	17,400	.6850	71	93	3,0	143	48	18	i	**4143076**
VDS202A17500	17,500	.6890	71	93	3,0	143	48	18	e	**4148399**
VDS402A17500	17,500	.6890	71	93	3,0	143	48	18	i	**4143078**
VDS402A17600	17,600	.6929	71	93	3,1	143	48	18	i	**4143079**
VDS402A17700	17,700	.6969	71	93	3,1	143	48	18	i	**4143080**
VDS402A17800	17,800	.7008	71	93	3,1	143	48	18	i	**4143081**
VDS402A17900	17,900	.7047	71	93	3,1	143	48	18	i	**4143093**
VDS202A18000	18,000	.7087	71	93	3,1	143	48	18	e	**4147921**
VDS402A18000	18,000	.7087	71	93	3,1	143	48	18	i	**4142803**
VDS402A18100	18,100	.7126	77	101	3,1	153	50	20	i	**4142804**
VDS402A18200	18,200	.7165	77	101	3,2	153	50	20	i	**4142805**
VDS402A18300	18,300	.7205	77	101	3,2	153	50	20	i	**4142807**

VDS202A • VDS402A • 5 x D

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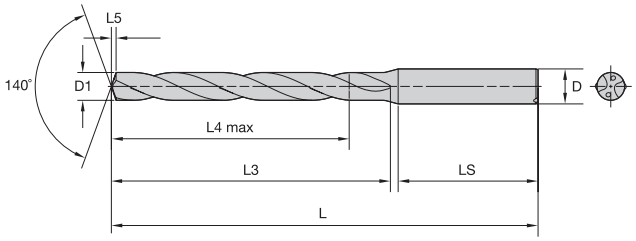
	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS402A18400	18,400	.7244	77	101	3,2	153	50	20	i	**4142808**
VDS202A18500	18,500	.7283	77	101	3,2	153	50	20	e	**4148307**
VDS402A18500	18,500	.7283	77	101	3,2	153	50	20	i	**4142809**
VDS402A18600	18,600	.7323	77	101	3,2	153	50	20	i	**4142810**
VDS402A18700	18,700	.7362	77	101	3,3	153	50	20	i	**4142812**
VDS402A18800	18,800	.7402	77	101	3,3	153	50	20	i	**4142824**
VDS402A18900	18,900	.7441	77	101	3,3	153	50	20	i	**4142826**
VDS202A19000	19,000	.7480	77	101	3,3	153	50	20	e	**4148323**
VDS402A19000	19,000	.7480	77	101	3,3	153	50	20	i	**4142828**
VDS402A19100	19,100	.7520	77	101	3,3	153	50	20	i	**4142833**
VDS402A19200	19,200	.7559	77	101	3,3	153	50	20	i	**4142835**
VDS402A19300	19,300	.7598	77	101	3,4	153	50	20	i	**4142837**
VDS402A19400	19,400	.7638	77	101	3,4	153	50	20	i	**4142839**
VDS202A19500	19,500	.7677	77	101	3,4	153	50	20	e	**4148329**
VDS402A19500	19,500	.7677	77	101	3,4	153	50	20	i	**4142841**
VDS402A19600	19,600	.7717	77	101	3,4	153	50	20	i	**4142853**
VDS402A19700	19,700	.7756	77	101	3,4	153	50	20	i	**4142854**
VDS402A19800	19,800	.7795	77	101	3,4	153	50	20	i	**4142856**
VDS202A19900	19,900	.7835	77	101	3,5	153	50	20	e	**4148333**
VDS402A19900	19,900	.7835	77	101	3,5	153	50	20	i	**4142859**
VDS202A20000	20,000	.7874	77	101	3,5	153	50	20	e	**4148334**
VDS402A20000	20,000	.7874	77	101	3,5	153	50	20	i	**4142860**

NOTE: CF = Coolant Feature:
i = internal
e = external
i/e = internal and external

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

VDS403A • 8 x D







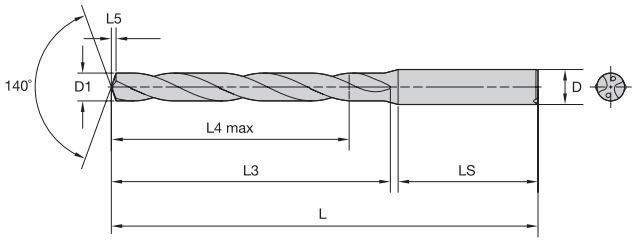
● first choice
○ alternate choice

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	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS403A01500	1,500	.0591	15	18	0,2	58	28	4	i	4143700
VDS403A01600	1,600	.0630	15	18	0,2	58	28	4	i	4143701
VDS403A01700	1,700	.0669	15	18	0,3	58	28	4	i	4143702
VDS403A01800	1,800	.0709	15	18	0,3	58	28	4	i	4143723
VDS403A01900	1,900	.0748	15	18	0,3	58	28	4	i	4143724
VDS403A02000	2,000	.0787	22	26	0,3	66	28	4	i	4143726
VDS403A02100	2,100	.0827	22	26	0,3	66	28	4	i	4143727
VDS403A02200	2,200	.0866	22	26	0,3	66	28	4	i	4143728
VDS403A02300	2,300	.0906	22	26	0,4	66	28	4	i	4143729
VDS403A02400	2,400	.0945	25	30	0,4	66	28	4	i	4143731
VDS403A02500	2,500	.0984	25	30	0,4	66	28	4	i	4143734
VDS403A02600	2,600	.1024	25	30	0,4	66	28	4	i	4143736
VDS403A02700	2,700	.1063	25	30	0,4	66	28	4	i	4143738
VDS403A02800	2,800	.1102	25	30	0,5	66	28	4	i	4143741
VDS403A02900	2,900	.1142	25	30	0,5	66	28	4	i	4143744
VDS403A03000	3,000	.1181	33	40	0,5	78	36	6	i	4143746
VDS403A03100	3,100	.1220	33	40	0,5	78	36	6	i	4143748
VDS403A03175	3,175	.1250	33	40	0,5	78	36	6	i	4143749
VDS403A03200	3,200	.1260	33	40	0,5	78	36	6	i	4143750
VDS403A03300	3,300	.1299	33	40	0,5	78	36	6	i	4143752
VDS403A03400	3,400	.1339	33	40	0,6	78	36	6	i	4143753
VDS403A03500	3,500	.1378	33	40	0,6	78	36	6	i	4143755
VDS403A03600	3,600	.1417	33	40	0,6	78	36	6	i	4143757
VDS403A03700	3,700	.1457	33	40	0,6	78	36	6	i	4143759
VDS403A03800	3,800	.1496	41	49	0,6	87	36	6	i	4143761
VDS403A03900	3,900	.1535	41	49	0,6	87	36	6	i	4143762
VDS403A03970	3,970	.1563	41	49	0,7	87	36	6	i	4143763
VDS403A04000	4,000	.1575	41	49	0,7	87	36	6	i	4143764
VDS403A04100	4,100	.1614	41	49	0,7	87	36	6	i	4143767
VDS403A04200	4,200	.1654	41	49	0,7	87	36	6	i	4143768
VDS403A04300	4,300	.1693	41	49	0,7	87	36	6	i	4143770
VDS403A04400	4,400	.1732	41	49	0,7	87	36	6	i	4143772
VDS403A04500	4,500	.1772	41	49	0,7	87	36	6	i	4143773
VDS403A04600	4,600	.1811	41	49	0,8	87	36	6	i	4143774
VDS403A04700	4,700	.1850	41	49	0,8	87	36	6	i	4143776
VDS403A04800	4,800	.1890	48	56	0,8	94	36	6	i	4143778
VDS403A04900	4,900	.1929	48	56	0,8	94	36	6	i	4143780
VDS403A05000	5,000	.1969	48	56	0,8	94	36	6	i	4143781
VDS403A05100	5,100	.2008	48	56	0,9	94	36	6	i	4143782
VDS403A05200	5,200	.2047	48	56	0,9	94	36	6	i	4143785
VDS403A05300	5,300	.2087	48	56	0,9	94	36	6	i	4143786
VDS403A05400	5,400	.2126	48	56	0,9	94	36	6	i	4143787
VDS403A05500	5,500	.2165	48	56	0,9	94	36	6	i	4143789
VDS403A05600	5,600	.2205	48	56	0,9	94	36	6	i	4143791
VDS403A05700	5,700	.2244	48	56	1,0	94	36	6	i	4143793
VDS403A05800	5,800	.2283	48	56	1,0	94	36	6	i	4143794
VDS403A05900	5,900	.2323	48	56	1,0	94	36	6	i	4143795
VDS403A06000	6,000	.2362	48	56	1,0	94	36	6	i	4143797
VDS403A06100	6,100	.2402	57	67	1,0	105	36	8	i	4143798
VDS403A06200	6,200	.2441	57	67	1,0	105	36	8	i	4143799
VDS403A06300	6,300	.2480	57	67	1,1	105	36	8	i	4143800
VDS403A06400	6,400	.2520	57	67	1,1	105	36	8	i	4143802
VDS403A06500	6,500	.2559	57	67	1,1	105	36	8	i	4143803
VDS403A06600	6,600	.2598	57	67	1,1	105	36	8	i	4143805
VDS403A06700	6,700	.2638	57	67	1,1	105	36	8	i	4143807
VDS403A06800	6,800	.2677	57	67	1,1	105	36	8	i	4143809
VDS403A06900	6,900	.2717	57	67	1,2	105	36	8	i	4143810
VDS403A07000	7,000	.2756	57	67	1,2	105	36	8	i	4143811
VDS403A07100	7,100	.2795	61	72	1,2	110	36	8	i	4143812
VDS403A07200	7,200	.2835	61	72	1,2	110	36	8	i	4143814
VDS403A07300	7,300	.2874	61	72	1,2	110	36	8	i	4143815
VDS403A07400	7,400	.2913	61	72	1,3	110	36	8	i	4143816
VDS403A07500	7,500	.2953	61	72	1,3	110	36	8	i	4143817
VDS403A07600	7,600	.2992	61	72	1,3	110	36	8	i	4143819

VDS403A • 8 x D

(continued)



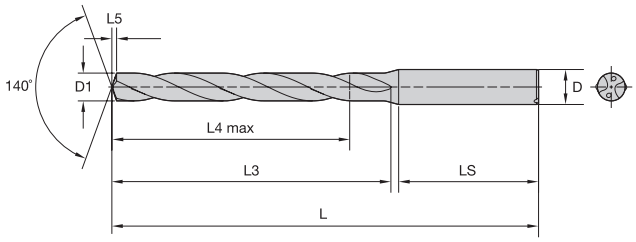
● first choice
○ alternate choice

P		●
M		●
K		●
N		●
S		●
H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS403A07700	7,700	.3031	61	72	1,3	110	36	8	i	4143820
VDS403A07800	7,800	.3071	61	72	1,3	110	36	8	i	4143821
VDS403A07900	7,900	.3110	61	72	1,3	110	36	8	i	4143822
VDS403A08000	8,000	.3150	61	72	1,4	110	36	8	i	4143824
VDS403A08100	8,100	.3189	68	80	1,4	122	40	10	i	4143825
VDS403A08200	8,200	.3228	68	80	1,4	122	40	10	i	4143826
VDS403A08300	8,300	.3268	68	80	1,4	122	40	10	i	4143827
VDS403A08400	8,400	.3307	68	80	1,4	122	40	10	i	4143829
VDS403A08500	8,500	.3346	68	80	1,4	122	40	10	i	4143831
VDS403A08600	8,600	.3386	68	80	1,5	122	40	10	i	4143832
VDS403A08700	8,700	.3425	68	80	1,5	122	40	10	i	4143833
VDS403A08800	8,800	.3465	68	80	1,5	122	40	10	i	4143835
VDS403A08900	8,900	.3504	68	80	1,5	122	40	10	i	4143836
VDS403A09000	9,000	.3543	68	80	1,5	122	40	10	i	4143837
VDS403A09100	9,100	.3583	68	80	1,6	122	40	10	i	4143838
VDS403A09200	9,200	.3622	68	80	1,6	122	40	10	i	4143840
VDS403A09300	9,300	.3661	68	80	1,6	122	40	10	i	4143841
VDS403A09400	9,400	.3701	68	80	1,6	122	40	10	i	4143843
VDS403A09500	9,500	.3740	68	80	1,6	122	40	10	i	4143844
VDS403A09600	9,600	.3780	68	80	1,6	122	40	10	i	4143846
VDS403A09700	9,700	.3819	68	80	1,7	122	40	10	i	4143847
VDS403A09800	9,800	.3858	68	80	1,7	122	40	10	i	4143848
VDS403A09900	9,900	.3898	68	80	1,7	122	40	10	i	4143849
VDS403A10000	10,000	.3937	68	80	1,7	122	40	10	i	4143421
VDS403A10100	10,100	.3976	79	94	1,7	141	45	12	i	4143422
VDS403A10200	10,200	.4016	79	94	1,7	141	45	12	i	4143473
VDS403A10300	10,300	.4055	79	94	1,8	141	45	12	i	4143474
VDS403A10400	10,400	.4094	79	94	1,8	141	45	12	i	4143476
VDS403A10500	10,500	.4134	79	94	1,8	141	45	12	i	4143477
VDS403A10600	10,600	.4173	79	94	1,8	141	45	12	i	4143478
VDS403A10700	10,700	.4213	79	94	1,8	141	45	12	i	4143479
VDS403A10800	10,800	.4252	79	94	1,9	141	45	12	i	4143481
VDS403A10900	10,900	.4291	79	94	1,9	141	45	12	i	4143482
VDS403A11000	11,000	.4331	79	94	1,9	141	45	12	i	4143483
VDS403A11100	11,100	.4370	79	94	1,9	141	45	12	i	4143484
VDS403A11200	11,200	.4409	79	94	1,9	141	45	12	i	4143486
VDS403A11300	11,300	.4449	79	94	1,9	141	45	12	i	4143487
VDS403A11400	11,400	.4488	79	94	2,0	141	45	12	i	4143488
VDS403A11500	11,500	.4528	79	94	2,0	141	45	12	i	4143489
VDS403A11600	11,600	.4567	79	94	2,0	141	45	12	i	4143491
VDS403A11700	11,700	.4606	79	94	2,0	141	45	12	i	4143492
VDS403A11800	11,800	.4646	79	94	2,0	141	45	12	i	4143493
VDS403A11900	11,900	.4685	79	94	2,0	141	45	12	i	4143494
VDS403A12000	12,000	.4724	79	94	2,1	141	45	12	i	4143496
VDS403A12100	12,100	.4764	91	108	2,1	155	45	14	i	4143497
VDS403A12200	12,200	.4803	91	108	2,1	155	45	14	i	4143498
VDS403A12300	12,300	.4843	91	108	2,1	155	45	14	i	4143499
VDS403A12400	12,400	.4882	91	108	2,1	155	45	14	i	4143501
VDS403A12500	12,500	.4921	91	108	2,2	155	45	14	i	4143502
VDS403A12600	12,600	.4961	91	108	2,2	155	45	14	i	4143503
VDS403A12700	12,700	.5000	91	108	2,2	155	45	14	i	4143504
VDS403A12800	12,800	.5039	91	108	2,2	155	45	14	i	4143505
VDS403A12900	12,900	.5079	91	108	2,2	155	45	14	i	4143506
VDS403A13000	13,000	.5118	91	108	2,2	155	45	14	i	4143507
VDS403A13100	13,100	.5157	91	108	2,3	155	45	14	i	4143509
VDS403A13200	13,200	.5197	91	108	2,3	155	45	14	i	4143510
VDS403A13300	13,300	.5236	91	108	2,3	155	45	14	i	4143511
VDS403A13400	13,400	.5276	91	108	2,3	155	45	14	i	4143512
VDS403A13500	13,500	.5315	91	108	2,3	155	45	14	i	4143513
VDS403A13600	13,600	.5354	91	108	2,3	155	45	14	i	4143514
VDS403A13700	13,700	.5394	91	108	2,4	155	45	14	i	4143515
VDS403A13800	13,800	.5433	91	108	2,4	155	45	14	i	4143516
VDS403A13900	13,900	.5472	91	108	2,4	155	45	14	i	4143518
VDS403A14000	14,000	.5512	91	108	2,4	155	45	14	i	4143519

VDS403A • 8 x D

(continued)



● first choice
○ alternate choice

P		●
M		●
K		●
N		●
S		●
H		

	D1 diameter									
catalogue number	mm	in	L4 max	L3	L5	L	LS	D	CF	WU25PD
VDS403A14100	14,100	.5551	101	121	2,4	171	48	16	i	**4143520**
VDS403A14200	14,200	.5591	101	121	2,5	171	48	16	i	**4143521**
VDS403A14300	14,300	.5630	101	121	2,5	171	48	16	i	**4143523**
VDS403A14400	14,400	.5669	101	121	2,5	171	48	16	i	**4143524**
VDS403A14500	14,500	.5709	101	121	2,5	171	48	16	i	**4143525**
VDS403A14600	14,600	.5748	101	121	2,5	171	48	16	i	**4143526**
VDS403A14700	14,700	.5787	101	121	2,5	171	48	16	i	**4143528**
VDS403A14800	14,800	.5827	101	121	2,6	171	48	16	i	**4143529**
VDS403A14900	14,900	.5866	101	121	2,6	171	48	16	i	**4143530**
VDS403A15000	15,000	.5906	101	121	2,6	171	48	16	i	**4143531**
VDS403A15100	15,100	.5945	101	121	2,6	171	48	16	i	**4143533**
VDS403A15200	15,200	.5984	101	121	2,6	171	48	16	i	**4143534**
VDS403A15300	15,300	.6024	101	121	2,6	171	48	16	i	**4143535**
VDS403A15400	15,400	.6063	101	121	2,7	171	48	16	i	**4143536**
VDS403A15500	15,500	.6102	101	121	2,7	171	48	16	i	**4143538**
VDS403A15600	15,600	.6142	101	121	2,7	171	48	16	i	**4143539**
VDS403A15700	15,700	.6181	101	121	2,7	171	48	16	i	**4143540**
VDS403A15800	15,800	.6220	101	121	2,7	171	48	16	i	**4143541**
VDS403A15900	15,900	.6260	101	121	2,8	171	48	16	i	**4143543**
VDS403A16000	16,000	.6299	101	121	2,8	171	48	16	i	**4143544**
VDS403A16200	16,200	.6378	113	135	2,8	185	48	18	i	**4143546**
VDS403A16500	16,500	.6496	113	135	2,9	185	48	18	i	**4143550**
VDS403A16700	16,700	.6575	113	135	2,9	185	48	18	i	**4143553**
VDS403A16800	16,800	.6614	113	135	2,9	185	48	18	i	**4143554**
VDS403A17000	17,000	.6693	113	135	3,0	185	48	18	i	**4143556**
VDS403A17500	17,500	.6890	113	135	3,0	185	48	18	i	**4143562**
VDS403A17600	17,600	.6929	113	135	3,1	185	48	18	i	**4143563**
VDS403A17800	17,800	.7008	113	135	3,1	185	48	18	i	**4143565**
VDS403A18000	18,000	.7087	113	135	3,1	185	48	18	i	**4144209**
VDS403A18100	18,100	.7126	124	148	3,1	200	50	20	i	**4144211**
VDS403A18200	18,200	.7165	124	148	3,2	200	50	20	i	**4144212**
VDS403A18500	18,500	.7283	124	148	3,2	200	50	20	i	**4144250**
VDS403A18800	18,800	.7402	124	148	3,3	200	50	20	i	**4144258**
VDS403A19000	19,000	.7480	124	148	3,3	200	50	20	i	**4144262**
VDS403A19500	19,500	.7677	124	148	3,4	200	50	20	i	**4144285**
VDS403A19800	19,800	.7795	124	148	3,4	200	50	20	i	**4144291**
VDS403A20000	20,000	.7874	124	148	3,5	200	50	20	i	**4144305**

NOTE: CF = Coolant Feature:
i = internal
e = external
i/e = internal and external

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

Application Data • VDS2 Series • WU25PD™ • Flood Coolant • Metric





Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate (f) by Diameter									
		min	–	max	Tool Diameter (mm)	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	60	–	100	mm/r	0,04–0,09	0,05–0,12	0,07–0,14	0,08–0,16	0,11–0,22	0,13–0,26	0,15–0,31	0,18–0,35	0,22–0,42	0,28–0,54
	2, 3, 4, 6, 7	50	–	90	mm/r	0,05–0,10	0,06–0,13	0,08–0,15	0,09–0,17	0,13–0,23	0,15–0,28	0,19–0,33	0,22–0,38	0,26–0,47	0,34–0,59
	5, 9, 10, 11	50	–	100	mm/r	0,05–0,10	0,06–0,13	0,07–0,15	0,08–0,17	0,12–0,23	0,14–0,28	0,17–0,33	0,19–0,38	0,23–0,47	0,29–0,59
	12, 13	30	–	60	mm/r	0,03–0,05	0,04–0,06	0,05–0,08	0,06–0,10	0,08–0,14	0,10–0,18	0,13–0,22	0,14–0,24	0,18–0,32	0,23–0,41
M	14.1	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	14.3	40	–	60	mm/r	0,02–0,06	0,03–0,07	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	14.2, 14.4	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,06–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	15, 16	70	–	150	mm/r	0,06–0,13	0,07–0,14	0,09–0,18	0,10–0,19	0,13–0,25	0,16–0,30	0,18–0,35	0,20–0,39	0,25–0,48	0,30–0,59
	17, 18, 19	90	–	120	mm/r	0,08–0,11	0,09–0,12	0,10–0,13	0,10–0,15	0,13–0,20	0,16–0,25	0,18–0,29	0,20–0,32	0,25–0,38	0,30–0,48
	20	80	–	120	mm/r	0,04–0,10	0,06–0,12	0,06–0,14	0,07–0,15	0,10–0,20	0,11–0,24	0,14–0,28	0,15–0,32	0,19–0,38	0,24–0,48
N	21	90	–	270	mm/r	0,05–0,12	0,06–0,13	0,08–0,14	0,10–0,16	0,12–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,48
	22, 23, 24	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,44	0,32–0,52
	25	90	–	225	mm/r	0,10–0,13	0,11–0,14	0,12–0,14	0,13–0,16	0,14–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,44
	26, 27, 28	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,40	0,32–0,48
S	31, 32	20	–	30	mm/r	0,01–0,04	0,02–0,05	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	33, 34, 35	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	36	20	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	37	20	–	50	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16

	Metric tolerance	
nominal size range	D1 tolerance	D tolerance h6
1–3	0,000/-0,014 (h8)	0,000/-0,006
>3–6	0,000/-0,012 (h7)	0,000/-0,008
>6–10	0,000/-0,015 (h7)	0,000/-0,009
>10–18	0,000/-0,018 (h7)	0,000/-0,011
>18–20	0,000/-0,021 (h7)	0,000/-0,013

Application Data • VDS4 Series • WU25PD™ • Through Coolant • Metric

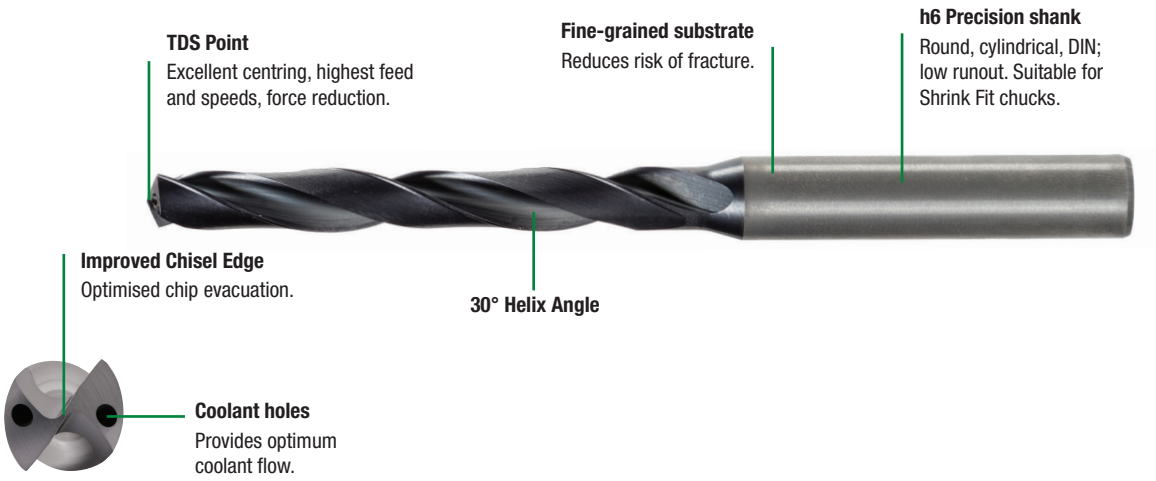


Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate (f) by Diameter									
		min	–	max	Tool Diameter (mm)	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	70	–	140	mm/r	0,04–0,09	0,05–0,12	0,07–0,14	0,08–0,16	0,11–0,22	0,13–0,26	0,15–0,31	0,18–0,35	0,22–0,42	0,28–0,54
	2, 3, 4, 6, 7	60	–	100	mm/r	0,05–0,10	0,06–0,13	0,08–0,15	0,09–0,17	0,13–0,23	0,15–0,28	0,19–0,33	0,22–0,38	0,26–0,47	0,34–0,59
	5, 9, 10, 11	50	–	100	mm/r	0,05–0,10	0,06–0,13	0,07–0,15	0,08–0,17	0,12–0,23	0,14–0,28	0,17–0,33	0,19–0,38	0,23–0,47	0,29–0,59
	12, 13	40	–	70	mm/r	0,03–0,05	0,04–0,06	0,05–0,08	0,06–0,10	0,08–0,14	0,10–0,18	0,13–0,22	0,14–0,24	0,18–0,32	0,23–0,41
M	14.1	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	14.3	40	–	60	mm/r	0,02–0,06	0,03–0,07	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	14.2, 14.4	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,06–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	15, 16	80	–	160	mm/r	0,07–0,14	0,08–0,15	0,10–0,20	0,11–0,22	0,14–0,28	0,18–0,34	0,21–0,40	0,23–0,44	0,28–0,54	0,34–0,67
	17, 18, 19	90	–	140	mm/r	0,09–0,13	0,10–0,14	0,11–0,14	0,12–0,17	0,14–0,23	0,18–0,28	0,21–0,32	0,23–0,36	0,28–0,43	0,34–0,54
	20	80	–	130	mm/r	0,05–0,12	0,06–0,14	0,07–0,15	0,08–0,17	0,11–0,23	0,13–0,27	0,15–0,32	0,17–0,36	0,22–0,43	0,27–0,54
N	21	90	–	315	mm/r	0,05–0,12	0,06–0,13	0,08–0,14	0,10–0,16	0,12–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,48
	22, 23, 24	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,44	0,32–0,52
	25	90	–	270	mm/r	0,10–0,13	0,11–0,14	0,12–0,14	0,13–0,16	0,14–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,44
	26, 27, 28	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,40	0,32–0,48
S	31, 32	20	–	30	mm/r	0,01–0,04	0,02–0,05	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	33, 34, 35	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	36	10	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	37	10	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16

	Metric tolerance	
nominal size range	D1 tolerance	D tolerance h6
1–3	0,000/-0,014 (h8)	0,000/-0,006
>3–6	0,000/-0,012 (h7)	0,000/-0,008
>6–10	0,000/-0,015 (h7)	0,000/-0,009
>10–18	0,000/-0,018 (h7)	0,000/-0,011
>18–20	0,000/-0,021 (h7)	0,000/-0,013

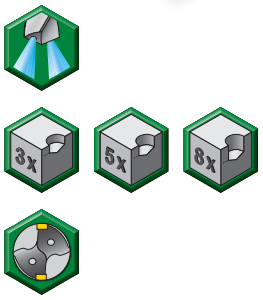
TOP DRILL S™

- Can be regrinded 3x at the standard level as the new tool.
- Available for custom solutions, as well as step drilling.
- Cylindrical shank h6 for perfect runout.



TOP DRILL S™ for Steel

Materials: P

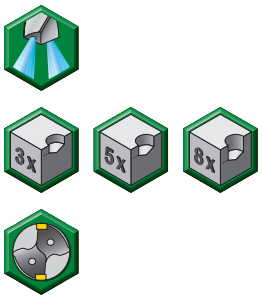


Diameter Range: 3–20mm
Grade: WP20PD

TOP DRILL S for steel is a high-performance solid carbide drill with an application-specific design. Although the point geometry is strong enough to drill stainless steel and cast iron, it is engineered to maximise performance when drilling steel. The two-margin design facilitates excellent hole quality and less friction when drilling steel at high speeds.

TOP DRILL S for Stainless Steel

Materials: M

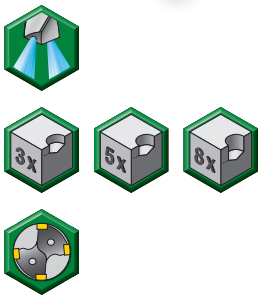


Diameter Range: 3–20mm
Grade: WM15PD

TOP DRILL S for stainless steel features a gash design made specifically for stainless steel and difficult-to-machine applications. This is reflected by a smooth chip transaction from the cutting edge to the flutes. This solid carbide drill is designed with increased wear resistance in heat-generating applications with tough materials.

TOP DRILL S for Cast Iron

Materials: K

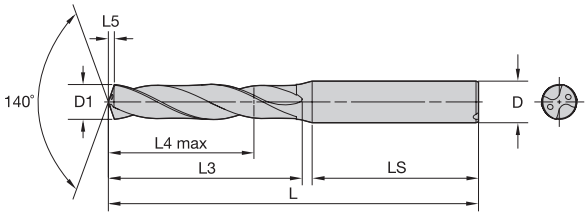


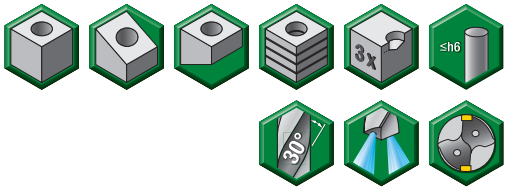
Diameter Range: 3–20mm
Grade: WK15PD

TOP DRILL S for cast iron is designed with application-specific point geometry for maximum performance in cast iron materials. The point features corner chamfers that minimise breakout on exit holes. A four-margin design improves hole straightness, increasing tool life and extending cross-hole and inclined exit capabilities when drilling tough cast iron.

TDS451A • 3 x D







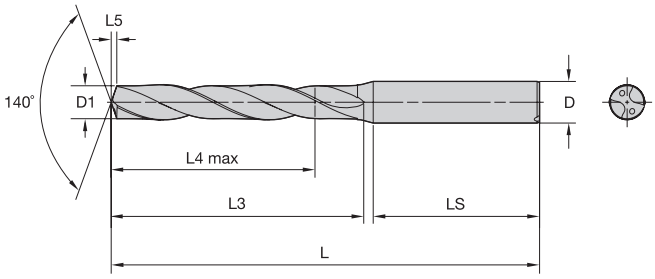
● first choice
○ alternate choice

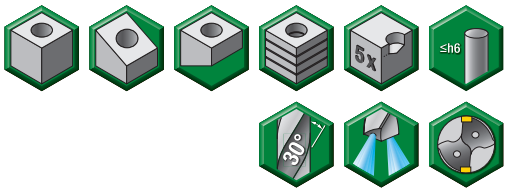
P	○
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S	○
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	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WM15PD
TDS451A06200	6,200	.2441	79	34	24	1,0	36	8	6327770
TDS451A06800	6,800	.2677	79	34	24	1,1	36	8	6327780
TDS451A08000	8,000	.3150	79	41	29	1,4	36	8	6327795
TDS451A10000	10,000	.3937	89	47	35	1,7	40	10	6327822
TDS451A10200	10,200	.4016	102	55	40	1,7	45	12	6327824
TDS451A15700	15,700	.6181	115	65	45	2,7	48	16	6327911

TDS452A • 5 x D







● first choice
○ alternate choice

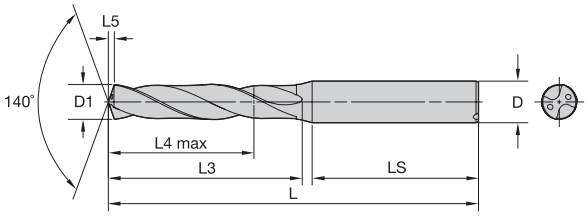
P	○
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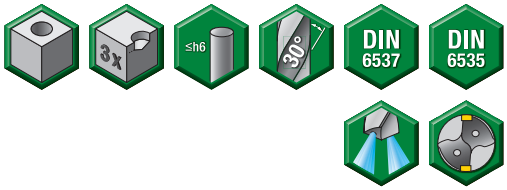
	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WM15PD
TDS452A07000	7,000	.2756	91	53	43	1,2	36	8	6328038

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FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

TDS401A • 3 x D







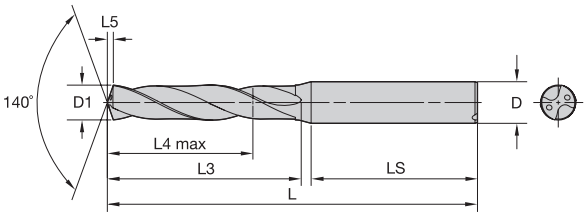
● first choice
○ alternate choice

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M	○
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catalogue number	D1 diameter mm	D1 diameter in	L	L3	L4 max	L5	LS	D	WP20PD
TDS401A03000	3,000	.1181	62	20	14	0,5	36	6	4163315
TDS401A03100	3,100	.1220	62	20	14	0,5	36	6	4163338
TDS401A03200	3,200	.1260	62	20	14	0,5	36	6	4163340
TDS401A03300	3,300	.1299	62	20	14	0,5	36	6	4163342
TDS401A03400	3,400	.1339	62	20	14	0,6	36	6	4163463
TDS401A03500	3,500	.1378	62	20	14	0,6	36	6	4163465
TDS401A03600	3,600	.1417	62	20	14	0,6	36	6	4163467
TDS401A03700	3,700	.1457	62	20	14	0,6	36	6	4163469
TDS401A03800	3,800	.1496	66	24	17	0,6	36	6	4163471
TDS401A03900	3,900	.1535	66	24	17	0,6	36	6	4163472
TDS401A04000	4,000	.1575	66	24	17	0,7	36	6	4163474
TDS401A04100	4,100	.1614	66	24	17	0,7	36	6	4163477
TDS401A04200	4,200	.1654	66	24	17	0,7	36	6	4163478
TDS401A04300	4,300	.1693	66	24	17	0,7	36	6	4163480
TDS401A04400	4,400	.1732	66	24	17	0,7	36	6	4163482
TDS401A04500	4,500	.1772	66	24	17	0,7	36	6	4163483
TDS401A04600	4,600	.1811	66	24	17	0,8	36	6	4163484
TDS401A04700	4,700	.1850	66	24	17	0,8	36	6	4163486
TDS401A04800	4,800	.1890	66	28	20	0,8	36	6	4163488
TDS401A04900	4,900	.1929	66	28	20	0,8	36	6	4163490
TDS401A05000	5,000	.1969	66	28	20	0,8	36	6	4163491
TDS401A05100	5,100	.2008	66	28	20	0,8	36	6	4163492
TDS401A05200	5,200	.2047	66	28	20	0,9	36	6	4163495
TDS401A05300	5,300	.2087	66	28	20	0,9	36	6	4163496
TDS401A05400	5,400	.2126	66	28	20	0,9	36	6	4163497
TDS401A05500	5,500	.2165	66	28	20	0,9	36	6	4163499
TDS401A05600	5,600	.2205	66	28	20	0,9	36	6	4163501
TDS401A05700	5,700	.2244	66	28	20	1,0	36	6	4163503
TDS401A05800	5,800	.2283	66	28	20	1,0	36	6	4163504
TDS401A05900	5,900	.2323	66	28	20	1,0	36	6	4163505
TDS401A06000	6,000	.2362	66	28	20	1,0	36	6	4163507
TDS401A06100	6,100	.2402	79	34	24	1,0	36	8	4163508
TDS401A06200	6,200	.2441	79	34	24	1,0	36	8	4163509
TDS401A06300	6,300	.2480	79	34	24	1,1	36	8	4163510
TDS401A06400	6,400	.2520	79	34	24	1,1	36	8	4163512
TDS401A06500	6,500	.2559	79	34	24	1,1	36	8	4163513
TDS401A06600	6,600	.2598	79	34	24	1,1	36	8	4163515
TDS401A06700	6,700	.2638	79	34	24	1,1	36	8	4163517
TDS401A06800	6,800	.2677	79	34	24	1,1	36	8	4163519
TDS401A06900	6,900	.2717	79	34	24	1,2	36	8	4163520
TDS401A07000	7,000	.2756	79	34	24	1,2	36	8	4163521
TDS401A07100	7,100	.2795	79	41	29	1,2	36	8	4163522
TDS401A07200	7,200	.2835	79	41	29	1,2	36	8	4163524
TDS401A07300	7,300	.2874	79	41	29	1,2	36	8	4163525
TDS401A07400	7,400	.2913	79	41	29	1,3	36	8	4163526
TDS401A07500	7,500	.2953	79	41	29	1,3	36	8	4163527
TDS401A07600	7,600	.2992	79	41	29	1,3	36	8	4163529
TDS401A07700	7,700	.3031	79	41	29	1,3	36	8	4163530
TDS401A07800	7,800	.3071	79	41	29	1,3	36	8	4163531
TDS401A07900	7,900	.3110	79	41	29	1,3	36	8	4163532
TDS401A08000	8,000	.3150	79	41	29	1,4	36	8	4163534
TDS401A08100	8,100	.3189	89	47	35	1,4	40	10	4163535
TDS401A08200	8,200	.3228	89	47	35	1,4	40	10	4163536
TDS401A08300	8,300	.3268	89	47	35	1,4	40	10	4163537
TDS401A08400	8,400	.3307	89	47	35	1,4	40	10	4163539
TDS401A08500	8,500	.3346	89	47	35	1,4	40	10	4163541

TDS401A • 3 x D

(continued)



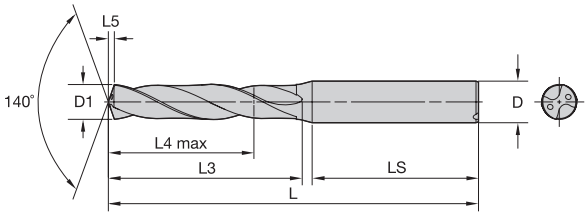
● first choice
○ alternate choice

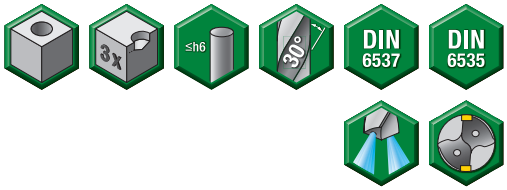
P		●
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	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WP20PD
TDS401A08600	8,600	.3386	89	47	35	1,5	40	10	4163542
TDS401A08700	8,700	.3425	89	47	35	1,5	40	10	4163543
TDS401A08800	8,800	.3465	89	47	35	1,5	40	10	4163545
TDS401A08900	8,900	.3504	89	47	35	1,5	40	10	4163546
TDS401A09000	9,000	.3543	89	47	35	1,5	40	10	4163547
TDS401A09100	9,100	.3583	89	47	35	1,5	40	10	4163548
TDS401A09200	9,200	.3622	89	47	35	1,6	40	10	4163550
TDS401A09300	9,300	.3661	89	47	35	1,6	40	10	4163551
TDS401A09400	9,400	.3701	89	47	35	1,6	40	10	4163553
TDS401A09500	9,500	.3740	89	47	35	1,6	40	10	4163554
TDS401A09600	9,600	.3780	89	47	35	1,6	40	10	4163556
TDS401A09700	9,700	.3819	89	47	35	1,7	40	10	4163557
TDS401A09800	9,800	.3858	89	47	35	1,7	40	10	4163558
TDS401A09900	9,900	.3898	89	47	35	1,7	40	10	4163559
TDS401A10000	10,000	.3937	89	47	35	1,7	40	10	4162950
TDS401A10100	10,100	.3976	102	55	40	1,7	45	12	4162951
TDS401A10200	10,200	.4016	102	55	40	1,7	45	12	4162952
TDS401A10300	10,300	.4055	102	55	40	1,8	45	12	4163343
TDS401A10400	10,400	.4094	102	55	40	1,8	45	12	4163345
TDS401A10500	10,500	.4134	102	55	40	1,8	45	12	4163346
TDS401A10600	10,600	.4173	102	55	40	1,8	45	12	4163347
TDS401A10700	10,700	.4213	102	55	40	1,8	45	12	4163348
TDS401A10800	10,800	.4252	102	55	40	1,8	45	12	4163350
TDS401A10900	10,900	.4291	102	55	40	1,9	45	12	4163351
TDS401A11000	11,000	.4331	102	55	40	1,9	45	12	4163352
TDS401A11100	11,100	.4370	102	55	40	1,9	45	12	4163353
TDS401A11200	11,200	.4409	102	55	40	1,9	45	12	4163355
TDS401A11300	11,300	.4449	102	55	40	1,9	45	12	4163356
TDS401A11400	11,400	.4488	102	55	40	2,0	45	12	4163357
TDS401A11500	11,500	.4528	102	55	40	2,0	45	12	4163358
TDS401A11600	11,600	.4567	102	55	40	2,0	45	12	4163360
TDS401A11700	11,700	.4606	102	55	40	2,0	45	12	4163361
TDS401A11800	11,800	.4646	102	55	40	2,0	45	12	4163362
TDS401A12000	12,000	.4724	102	55	40	2,1	45	12	4163365
TDS401A12100	12,100	.4764	107	60	43	2,1	45	14	4163366
TDS401A12200	12,200	.4803	107	60	43	2,1	45	14	4163367
TDS401A12300	12,300	.4843	107	60	43	2,1	45	14	4163368
TDS401A12400	12,400	.4882	107	60	43	2,1	45	14	4163370
TDS401A12500	12,500	.4921	107	60	43	2,1	45	14	4163371
TDS401A12600	12,600	.4961	107	60	43	2,2	45	14	4163372
TDS401A12700	12,700	.5000	107	60	43	2,2	45	14	4163373
TDS401A12800	12,800	.5039	107	60	43	2,2	45	14	4163374
TDS401A12900	12,900	.5079	107	60	43	2,2	45	14	4163375
TDS401A13000	13,000	.5118	107	60	43	2,2	45	14	4163376
TDS401A13100	13,100	.5157	107	60	43	2,3	45	14	4163378
TDS401A13200	13,200	.5197	107	60	43	2,3	45	14	4163379
TDS401A13300	13,300	.5236	107	60	43	2,3	45	14	4163380
TDS401A13400	13,400	.5276	107	60	43	2,3	45	14	4163381
TDS401A13500	13,500	.5315	107	60	43	2,3	45	14	4163382
TDS401A13600	13,600	.5354	107	60	43	2,3	45	14	4163383
TDS401A13700	13,700	.5394	107	60	43	2,4	45	14	4163384
TDS401A13800	13,800	.5433	107	60	43	2,4	45	14	4163385
TDS401A13900	13,900	.5472	107	60	43	2,4	45	14	4163387
TDS401A14000	14,000	.5512	107	60	43	2,4	45	14	4163388
TDS401A14200	14,200	.5591	115	65	45	2,5	48	16	4163390
TDS401A14300	14,300	.5630	115	65	45	2,5	48	16	4163392
TDS401A14500	14,500	.5709	115	65	45	2,5	48	16	4163394
TDS401A14700	14,700	.5787	115	65	45	2,5	48	16	4163397
TDS401A15000	15,000	.5906	115	65	45	2,6	48	16	4163400
TDS401A16000	16,000	.6299	115	65	45	2,8	48	16	4163413
TDS401A16500	16,500	.6496	123	73	51	2,9	48	18	4163419
TDS401A17000	17,000	.6693	123	73	51	2,9	48	18	4163425
TDS401A17500	17,500	.6890	123	73	51	3,0	48	18	4163431
TDS401A18000	18,000	.7087	123	73	51	3,1	48	18	4163271
TDS401A19000	19,000	.7480	131	79	55	3,3	50	20	4163293
TDS401A20000	20,000	.7874	131	79	55	3,5	50	20	4163304

TDS411A • 3 x D







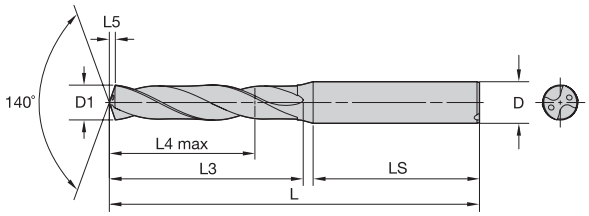
● first choice
○ alternate choice

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catalogue number	D1 diameter mm	D1 diameter in	L	L3	L4 max	L5	LS	D	WK15PD
TDS411A03000	3,000	.1181	62	20	14	0,5	36	6	4157799
TDS411A03100	3,100	.1220	62	20	14	0,5	36	6	4157801
TDS411A03200	3,200	.1260	62	20	14	0,5	36	6	4157803
TDS411A03300	3,300	.1299	62	20	14	0,5	36	6	4157805
TDS411A03400	3,400	.1339	62	20	14	0,6	36	6	4157806
TDS411A03500	3,500	.1378	62	20	14	0,6	36	6	4157808
TDS411A03600	3,600	.1417	62	20	14	0,6	36	6	4157810
TDS411A03700	3,700	.1457	62	20	14	0,6	36	6	4157812
TDS411A03800	3,800	.1496	66	24	17	0,6	36	6	4157814
TDS411A03900	3,900	.1535	66	24	17	0,6	36	6	4157815
TDS411A04000	4,000	.1575	66	24	17	0,7	36	6	4157817
TDS411A04100	4,100	.1614	66	24	17	0,7	36	6	4157820
TDS411A04200	4,200	.1654	66	24	17	0,7	36	6	4157821
TDS411A04300	4,300	.1693	66	24	17	0,7	36	6	4157823
TDS411A04400	4,400	.1732	66	24	17	0,7	36	6	4157825
TDS411A04500	4,500	.1772	66	24	17	0,7	36	6	4157826
TDS411A04600	4,600	.1811	66	24	17	0,8	36	6	4157827
TDS411A04700	4,700	.1850	66	24	17	0,8	36	6	4157829
TDS411A04800	4,800	.1890	66	28	20	0,8	36	6	4157831
TDS411A04900	4,900	.1929	66	28	20	0,8	36	6	4157833
TDS411A05000	5,000	.1969	66	28	20	0,8	36	6	4157834
TDS411A05100	5,100	.2008	66	28	20	0,8	36	6	4157835
TDS411A05200	5,200	.2047	66	28	20	0,9	36	6	4157838
TDS411A05300	5,300	.2087	66	28	20	0,9	36	6	4157839
TDS411A05400	5,400	.2126	66	28	20	0,9	36	6	4157840
TDS411A05500	5,500	.2165	66	28	20	0,9	36	6	4157842
TDS411A05600	5,600	.2205	66	28	20	0,9	36	6	4157844
TDS411A05700	5,700	.2244	66	28	20	1,0	36	6	4157846
TDS411A05800	5,800	.2283	66	28	20	1,0	36	6	4157847
TDS411A05900	5,900	.2323	66	28	20	1,0	36	6	4157848
TDS411A06000	6,000	.2362	66	28	20	1,0	36	6	4157850
TDS411A06100	6,100	.2402	79	34	24	1,0	36	8	4157851
TDS411A06200	6,200	.2441	79	34	24	1,0	36	8	4157852
TDS411A06300	6,300	.2480	79	34	24	1,1	36	8	4157853
TDS411A06400	6,400	.2520	79	34	24	1,1	36	8	4157855
TDS411A06500	6,500	.2559	79	34	24	1,1	36	8	4157856
TDS411A06600	6,600	.2598	79	34	24	1,1	36	8	4157858
TDS411A06700	6,700	.2638	79	34	24	1,1	36	8	4157860
TDS411A06800	6,800	.2677	79	34	24	1,1	36	8	4157862
TDS411A06900	6,900	.2717	79	34	24	1,2	36	8	4157863
TDS411A07000	7,000	.2756	79	34	24	1,2	36	8	4157864
TDS411A07100	7,100	.2795	79	41	29	1,2	36	8	4157865
TDS411A07200	7,200	.2835	79	41	29	1,2	36	8	4157867
TDS411A07300	7,300	.2874	79	41	29	1,2	36	8	4157868
TDS411A07400	7,400	.2913	79	41	29	1,3	36	8	4157869
TDS411A07500	7,500	.2953	79	41	29	1,3	36	8	4157870
TDS411A07600	7,600	.2992	79	41	29	1,3	36	8	4157872
TDS411A07700	7,700	.3031	79	41	29	1,3	36	8	4157873
TDS411A07800	7,800	.3071	79	41	29	1,3	36	8	4157874
TDS411A07900	7,900	.3110	79	41	29	1,3	36	8	4157875
TDS411A08000	8,000	.3150	79	41	29	1,4	36	8	4157877
TDS411A08100	8,100	.3189	89	47	35	1,4	40	10	4157878
TDS411A08200	8,200	.3228	89	47	35	1,4	40	10	4157879
TDS411A08300	8,300	.3268	89	47	35	1,4	40	10	4157880
TDS411A08400	8,400	.3307	89	47	35	1,4	40	10	4157882
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TDS411A • 3 x D

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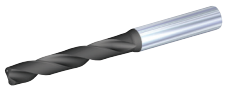


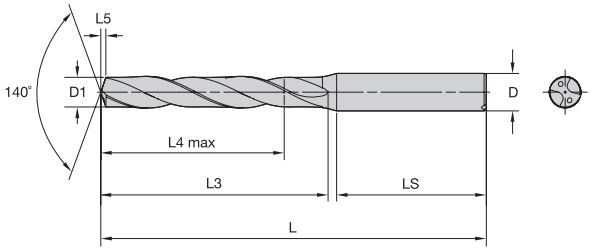
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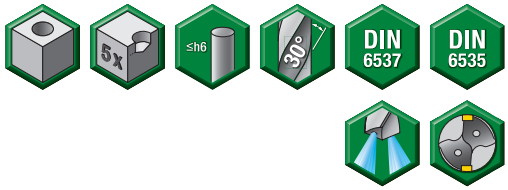
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	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WK15PD
TDS411A08600	8,600	.3386	89	47	35	1,5	40	10	4157885
TDS411A08700	8,700	.3425	89	47	35	1,5	40	10	4157886
TDS411A08800	8,800	.3465	89	47	35	1,5	40	10	4157888
TDS411A08900	8,900	.3504	89	47	35	1,5	40	10	4157889
TDS411A09000	9,000	.3543	89	47	35	1,5	40	10	4157890
TDS411A09100	9,100	.3583	89	47	35	1,5	40	10	4157891
TDS411A09200	9,200	.3622	89	47	35	1,6	40	10	4157893
TDS411A09300	9,300	.3661	89	47	35	1,6	40	10	4157894
TDS411A09400	9,400	.3701	89	47	35	1,6	40	10	4157896
TDS411A09500	9,500	.3740	89	47	35	1,6	40	10	4157897
TDS411A09600	9,600	.3780	89	47	35	1,6	40	10	4157899
TDS411A09700	9,700	.3819	89	47	35	1,7	40	10	4157900
TDS411A09800	9,800	.3858	89	47	35	1,7	40	10	4157901
TDS411A09900	9,900	.3898	89	47	35	1,7	40	10	4157902
TDS411A10000	10,000	.3937	89	47	35	1,7	40	10	4156562
TDS411A10100	10,100	.3976	102	55	40	1,7	45	12	4156603
TDS411A10200	10,200	.4016	102	55	40	1,7	45	12	4156604
TDS411A10300	10,300	.4055	102	55	40	1,8	45	12	4156605
TDS411A10400	10,400	.4094	102	55	40	1,8	45	12	4156607
TDS411A10500	10,500	.4134	102	55	40	1,8	45	12	4156608
TDS411A10600	10,600	.4173	102	55	40	1,8	45	12	4156609
TDS411A10700	10,700	.4213	102	55	40	1,8	45	12	4156610
TDS411A10800	10,800	.4252	102	55	40	1,8	45	12	4156612
TDS411A10900	10,900	.4291	102	55	40	1,9	45	12	4156613
TDS411A11000	11,000	.4331	102	55	40	1,9	45	12	4156614
TDS411A11100	11,100	.4370	102	55	40	1,9	45	12	4156615
TDS411A11200	11,200	.4409	102	55	40	1,9	45	12	4156617
TDS411A11300	11,300	.4449	102	55	40	1,9	45	12	4156618
TDS411A11400	11,400	.4488	102	55	40	2,0	45	12	4156619
TDS411A11500	11,500	.4528	102	55	40	2,0	45	12	4156620
TDS411A11600	11,600	.4567	102	55	40	2,0	45	12	4156622
TDS411A11700	11,700	.4606	102	55	40	2,0	45	12	4156623
TDS411A11800	11,800	.4646	102	55	40	2,0	45	12	4156624
TDS411A11900	11,900	.4685	102	55	40	2,0	45	12	4156625
TDS411A12000	12,000	.4724	102	55	40	2,1	45	12	4156627
TDS411A12100	12,100	.4764	107	60	43	2,1	45	14	4156628
TDS411A12200	12,200	.4803	107	60	43	2,1	45	14	4156629
TDS411A12300	12,300	.4843	107	60	43	2,1	45	14	4156630
TDS411A12400	12,400	.4882	107	60	43	2,1	45	14	4156632
TDS411A12500	12,500	.4921	107	60	43	2,1	45	14	4156633
TDS411A12600	12,600	.4961	107	60	43	2,2	45	14	4156634
TDS411A12700	12,700	.5000	107	60	43	2,2	45	14	4156635
TDS411A12800	12,800	.5039	107	60	43	2,2	45	14	4156636
TDS411A12900	12,900	.5079	107	60	43	2,2	45	14	4156637
TDS411A13000	13,000	.5118	107	60	43	2,2	45	14	4156638
TDS411A13100	13,100	.5157	107	60	43	2,3	45	14	4156640
TDS411A13200	13,200	.5197	107	60	43	2,3	45	14	4156641
TDS411A13300	13,300	.5236	107	60	43	2,3	45	14	4156642
TDS411A13400	13,400	.5276	107	60	43	2,3	45	14	4156643
TDS411A13500	13,500	.5315	107	60	43	2,3	45	14	4156644
TDS411A13600	13,600	.5354	107	60	43	2,3	45	14	4156645
TDS411A13700	13,700	.5394	107	60	43	2,4	45	14	4156646
TDS411A13800	13,800	.5433	107	60	43	2,4	45	14	4156647
TDS411A13900	13,900	.5472	107	60	43	2,4	45	14	4156649
TDS411A14000	14,000	.5512	107	60	43	2,4	45	14	4156650
TDS411A14200	14,200	.5591	115	65	45	2,5	48	16	4156652
TDS411A14300	14,300	.5630	115	65	45	2,5	48	16	4156654
TDS411A14500	14,500	.5709	115	65	45	2,5	48	16	4156656
TDS411A14700	14,700	.5787	115	65	45	2,5	48	16	4156659
TDS411A15000	15,000	.5906	115	65	45	2,6	48	16	4156662
TDS411A16000	16,000	.6299	115	65	45	2,8	48	16	4156675
TDS411A16500	16,500	.6496	123	73	51	2,9	48	18	4156681
TDS411A17000	17,000	.6693	123	73	51	2,9	48	18	4156687
TDS411A17500	17,500	.6890	123	73	51	3,0	48	18	4156693
TDS411A18000	18,000	.7087	123	73	51	3,1	48	18	4156699
TDS411A19000	19,000	.7480	131	79	55	3,3	50	20	4156721
TDS411A20000	20,000	.7874	131	79	55	3,5	50	20	4156732

TDS402A • 5 x D







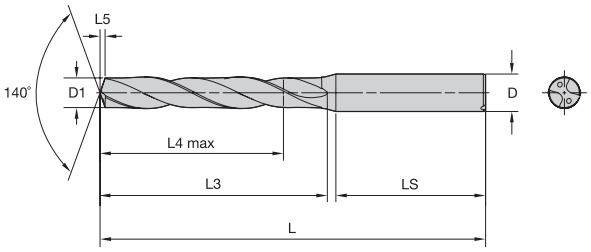
● first choice
○ alternate choice

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	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WP20PD
TDS402A03000	3,000	.1181	66	28	23	0,5	36	6	4162967
TDS402A03100	3,100	.1220	66	28	23	0,5	36	6	4162969
TDS402A03200	3,200	.1260	66	28	23	0,5	36	6	4162972
TDS402A03300	3,300	.1299	66	28	23	0,5	36	6	4162984
TDS402A03400	3,400	.1339	66	28	23	0,6	36	6	4162985
TDS402A03500	3,500	.1378	66	28	23	0,6	36	6	4162987
TDS402A03600	3,600	.1417	66	28	23	0,6	36	6	4162989
TDS402A03700	3,700	.1457	66	28	23	0,6	36	6	4162991
TDS402A03800	3,800	.1496	74	36	29	0,6	36	6	4162993
TDS402A03900	3,900	.1535	74	36	29	0,6	36	6	4162994
TDS402A04000	4,000	.1575	74	36	29	0,7	36	6	4162996
TDS402A04100	4,100	.1614	74	36	29	0,7	36	6	4162999
TDS402A04200	4,200	.1654	74	36	29	0,7	36	6	4163000
TDS402A04300	4,300	.1693	74	36	29	0,7	36	6	4163002
TDS402A04400	4,400	.1732	74	36	29	0,7	36	6	4163014
TDS402A04500	4,500	.1772	74	36	29	0,7	36	6	4163015
TDS402A04600	4,600	.1811	74	36	29	0,8	36	6	4163016
TDS402A04700	4,700	.1850	74	36	29	0,8	36	6	4163018
TDS402A04800	4,800	.1890	82	44	35	0,8	36	6	4163020
TDS402A04900	4,900	.1929	82	44	35	0,8	36	6	4163022
TDS402A05000	5,000	.1969	82	44	35	0,8	36	6	4163023
TDS402A05100	5,100	.2008	82	44	35	0,8	36	6	4163024
TDS402A05200	5,200	.2047	82	44	35	0,9	36	6	4163027
TDS402A05300	5,300	.2087	82	44	35	0,9	36	6	4163028
TDS402A05400	5,400	.2126	82	44	35	0,9	36	6	4163029
TDS402A05500	5,500	.2165	82	44	35	0,9	36	6	4163031
TDS402A05600	5,600	.2205	82	44	35	0,9	36	6	4163034
TDS402A05700	5,700	.2244	82	44	35	1,0	36	6	4163036
TDS402A05800	5,800	.2283	82	44	35	1,0	36	6	4163037
TDS402A05900	5,900	.2323	82	44	35	1,0	36	6	4163038
TDS402A06000	6,000	.2362	82	44	35	1,0	36	6	4163040
TDS402A06100	6,100	.2402	91	53	43	1,0	36	8	4163041
TDS402A06200	6,200	.2441	91	53	43	1,0	36	8	4163042
TDS402A06300	6,300	.2480	91	53	43	1,1	36	8	4163043
TDS402A06400	6,400	.2520	91	53	43	1,1	36	8	4163045
TDS402A06500	6,500	.2559	91	53	43	1,1	36	8	4163046
TDS402A06600	6,600	.2598	91	53	43	1,1	36	8	4163048
TDS402A06700	6,700	.2638	91	53	43	1,1	36	8	4163050
TDS402A06800	6,800	.2677	91	53	43	1,1	36	8	4163052
TDS402A06900	6,900	.2717	91	53	43	1,2	36	8	4163053
TDS402A07000	7,000	.2756	91	53	43	1,2	36	8	4163054
TDS402A07100	7,100	.2795	91	53	43	1,2	36	8	4163055
TDS402A07200	7,200	.2835	91	53	43	1,2	36	8	4163057
TDS402A07300	7,300	.2874	91	53	43	1,2	36	8	4163058
TDS402A07400	7,400	.2913	91	53	43	1,3	36	8	4163059
TDS402A07500	7,500	.2953	91	53	43	1,3	36	8	4163060
TDS402A07600	7,600	.2992	91	53	43	1,3	36	8	4163062
TDS402A07700	7,700	.3031	91	53	43	1,3	36	8	4163063
TDS402A07800	7,800	.3071	91	53	43	1,3	36	8	4163064
TDS402A07900	7,900	.3110	91	53	43	1,3	36	8	4163065
TDS402A08000	8,000	.3150	91	53	43	1,4	36	8	4163067
TDS402A08100	8,100	.3189	103	61	49	1,4	40	10	4163068
TDS402A08200	8,200	.3228	103	61	49	1,4	40	10	4163069
TDS402A08300	8,300	.3268	103	61	49	1,4	40	10	4163070
TDS402A08400	8,400	.3307	103	61	49	1,4	40	10	4163072
TDS402A08500	8,500	.3346	103	61	49	1,4	40	10	4163074

TDS402A • 5 x D

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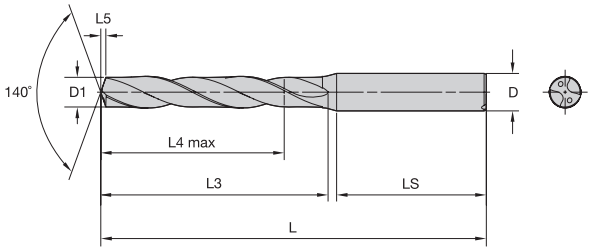
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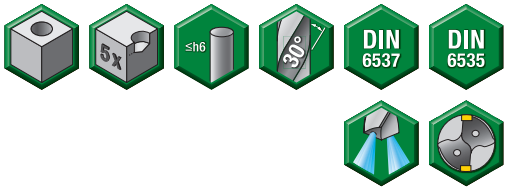
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	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WP20PD
TDS402A08600	8,600	.3386	103	61	49	1,5	40	10	4163075
TDS402A08700	8,700	.3425	103	61	49	1,5	40	10	4163077
TDS402A08800	8,800	.3465	103	61	49	1,5	40	10	4163079
TDS402A08900	8,900	.3504	103	61	49	1,5	40	10	4163080
TDS402A09000	9,000	.3543	103	61	49	1,5	40	10	4163081
TDS402A09100	9,100	.3583	103	61	49	1,5	40	10	4163082
TDS402A09200	9,200	.3622	103	61	49	1,6	40	10	4163084
TDS402A09300	9,300	.3661	103	61	49	1,6	40	10	4163085
TDS402A09400	9,400	.3701	103	61	49	1,6	40	10	4163087
TDS402A09500	9,500	.3740	103	61	49	1,6	40	10	4163088
TDS402A09600	9,600	.3780	103	61	49	1,6	40	10	4163090
TDS402A09700	9,700	.3819	103	61	49	1,7	40	10	4163091
TDS402A09800	9,800	.3858	103	61	49	1,7	40	10	4163092
TDS402A09900	9,900	.3898	103	61	49	1,7	40	10	4163093
TDS402A10000	10,000	.3937	103	61	49	1,7	40	10	4162803
TDS402A10100	10,100	.3976	118	71	56	1,7	45	12	4162804
TDS402A10200	10,200	.4016	118	71	56	1,7	45	12	4162805
TDS402A10300	10,300	.4055	118	71	56	1,8	45	12	4162806
TDS402A10400	10,400	.4094	118	71	56	1,8	45	12	4162808
TDS402A10500	10,500	.4134	118	71	56	1,8	45	12	4162809
TDS402A10600	10,600	.4173	118	71	56	1,8	45	12	4162810
TDS402A10700	10,700	.4213	118	71	56	1,8	45	12	4162811
TDS402A10800	10,800	.4252	118	71	56	1,8	45	12	4162813
TDS402A10900	10,900	.4291	118	71	56	1,9	45	12	4162814
TDS402A11000	11,000	.4331	118	71	56	1,9	45	12	4162815
TDS402A11200	11,200	.4409	118	71	56	1,9	45	12	4162818
TDS402A11300	11,300	.4449	118	71	56	1,9	45	12	4162819
TDS402A11400	11,400	.4488	118	71	56	2,0	45	12	4162820
TDS402A11500	11,500	.4528	118	71	56	2,0	45	12	4162821
TDS402A11600	11,600	.4567	118	71	56	2,0	45	12	4162823
TDS402A11700	11,700	.4606	118	71	56	2,0	45	12	4162824
TDS402A11800	11,800	.4646	118	71	56	2,0	45	12	4162825
TDS402A12000	12,000	.4724	118	71	56	2,1	45	12	4162828
TDS402A12100	12,100	.4764	124	77	60	2,1	45	14	4162829
TDS402A12200	12,200	.4803	124	77	60	2,1	45	14	4162830
TDS402A12300	12,300	.4843	124	77	60	2,1	45	14	4162831
TDS402A12400	12,400	.4882	124	77	60	2,1	45	14	4162833
TDS402A12500	12,500	.4921	124	77	60	2,1	45	14	4162834
TDS402A12600	12,600	.4961	124	77	60	2,2	45	14	4162835
TDS402A12700	12,700	.5000	124	77	60	2,2	45	14	4162836
TDS402A12800	12,800	.5039	124	77	60	2,2	45	14	4162837
TDS402A12900	12,900	.5079	124	77	60	2,2	45	14	4162838
TDS402A13000	13,000	.5118	124	77	60	2,2	45	14	4162839
TDS402A13100	13,100	.5157	124	77	60	2,3	45	14	4162841
TDS402A13200	13,200	.5197	124	77	60	2,3	45	14	4162842
TDS402A13300	13,300	.5236	124	77	60	2,3	45	14	4162843
TDS402A13400	13,400	.5276	124	77	60	2,3	45	14	4162844
TDS402A13500	13,500	.5315	124	77	60	2,3	45	14	4162845
TDS402A13600	13,600	.5354	124	77	60	2,3	45	14	4162846
TDS402A13700	13,700	.5394	124	77	60	2,4	45	14	4162847
TDS402A13800	13,800	.5433	124	77	60	2,4	45	14	4162848
TDS402A13900	13,900	.5472	124	77	60	2,4	45	14	4162850
TDS402A14000	14,000	.5512	124	77	60	2,4	45	14	4162851
TDS402A14200	14,200	.5591	133	83	63	2,5	48	16	4162853
TDS402A14300	14,300	.5630	133	83	63	2,5	48	16	4162855
TDS402A14500	14,500	.5709	133	83	63	2,5	48	16	4162857
TDS402A14700	14,700	.5787	133	83	63	2,5	48	16	4162860
TDS402A15000	15,000	.5906	133	83	63	2,6	48	16	4162863
TDS402A16000	16,000	.6299	133	83	63	2,8	48	16	4162876
TDS402A16500	16,500	.6496	143	93	71	2,9	48	18	4162882
TDS402A17000	17,000	.6693	143	93	71	2,9	48	18	4162888
TDS402A17500	17,500	.6890	143	93	71	3,0	48	18	4162894
TDS402A18000	18,000	.7087	143	93	71	3,1	48	18	4162274
TDS402A19000	19,000	.7480	153	101	77	3,3	50	20	4162396
TDS402A20000	20,000	.7874	153	101	77	3,5	50	20	4162407

TDS412A • 5 x D







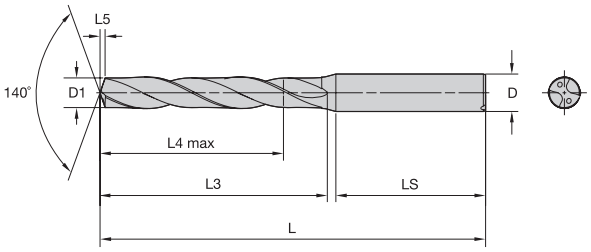
● first choice
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	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WK15PD
TDS412A03000	3,000	.1181	66	28	23	0,5	36	6	4158757
TDS412A03100	3,100	.1220	66	28	23	0,5	36	6	4158759
TDS412A03200	3,200	.1260	66	28	23	0,5	36	6	4158761
TDS412A03300	3,300	.1299	66	28	23	0,5	36	6	4158793
TDS412A03400	3,400	.1339	66	28	23	0,6	36	6	4158794
TDS412A03500	3,500	.1378	66	28	23	0,6	36	6	4158796
TDS412A03600	3,600	.1417	66	28	23	0,6	36	6	4158798
TDS412A03700	3,700	.1457	66	28	23	0,6	36	6	4158800
TDS412A03800	3,800	.1496	74	36	29	0,6	36	6	4158802
TDS412A03900	3,900	.1535	74	36	29	0,6	36	6	4158803
TDS412A04000	4,000	.1575	74	36	29	0,7	36	6	4158805
TDS412A04100	4,100	.1614	74	36	29	0,7	36	6	4158808
TDS412A04200	4,200	.1654	74	36	29	0,7	36	6	4158809
TDS412A04300	4,300	.1693	74	36	29	0,7	36	6	4158811
TDS412A04400	4,400	.1732	74	36	29	0,7	36	6	4158813
TDS412A04500	4,500	.1772	74	36	29	0,7	36	6	4158814
TDS412A04600	4,600	.1811	74	36	29	0,8	36	6	4158815
TDS412A04700	4,700	.1850	74	36	29	0,8	36	6	4158817
TDS412A04800	4,800	.1890	82	44	35	0,8	36	6	4158819
TDS412A04900	4,900	.1929	82	44	35	0,8	36	6	4158821
TDS412A05000	5,000	.1969	82	44	35	0,8	36	6	4158822
TDS412A05100	5,100	.2008	82	44	35	0,8	36	6	4158823
TDS412A05200	5,200	.2047	82	44	35	0,9	36	6	4158826
TDS412A05300	5,300	.2087	82	44	35	0,9	36	6	4158827
TDS412A05400	5,400	.2126	82	44	35	0,9	36	6	4158828
TDS412A05500	5,500	.2165	82	44	35	0,9	36	6	4158830
TDS412A05600	5,600	.2205	82	44	35	0,9	36	6	4158832
TDS412A05700	5,700	.2244	82	44	35	1,0	36	6	4158834
TDS412A05800	5,800	.2283	82	44	35	1,0	36	6	4158835
TDS412A05900	5,900	.2323	82	44	35	1,0	36	6	4158836
TDS412A06000	6,000	.2362	82	44	35	1,0	36	6	4158838
TDS412A06100	6,100	.2402	91	53	43	1,0	36	8	4158839
TDS412A06200	6,200	.2441	91	53	43	1,0	36	8	4158840
TDS412A06300	6,300	.2480	91	53	43	1,1	36	8	4158841
TDS412A06400	6,400	.2520	91	53	43	1,1	36	8	4158843
TDS412A06500	6,500	.2559	91	53	43	1,1	36	8	4158844
TDS412A06600	6,600	.2598	91	53	43	1,1	36	8	4158846
TDS412A06700	6,700	.2638	91	53	43	1,1	36	8	4158848
TDS412A06800	6,800	.2677	91	53	43	1,1	36	8	4158850
TDS412A06900	6,900	.2717	91	53	43	1,2	36	8	4158851
TDS412A07000	7,000	.2756	91	53	43	1,2	36	8	4158852
TDS412A07100	7,100	.2795	91	53	43	1,2	36	8	4158853
TDS412A07200	7,200	.2835	91	53	43	1,2	36	8	4158855
TDS412A07300	7,300	.2874	91	53	43	1,2	36	8	4158856
TDS412A07400	7,400	.2913	91	53	43	1,3	36	8	4158857
TDS412A07500	7,500	.2953	91	53	43	1,3	36	8	4158858
TDS412A07600	7,600	.2992	91	53	43	1,3	36	8	4158860
TDS412A07700	7,700	.3031	91	53	43	1,3	36	8	4158861
TDS412A07800	7,800	.3071	91	53	43	1,3	36	8	4158862
TDS412A07900	7,900	.3110	91	53	43	1,3	36	8	4158863
TDS412A08000	8,000	.3150	91	53	43	1,4	36	8	4158865
TDS412A08100	8,100	.3189	103	61	49	1,4	40	10	4158866
TDS412A08200	8,200	.3228	103	61	49	1,4	40	10	4158867
TDS412A08300	8,300	.3268	103	61	49	1,4	40	10	4158868
TDS412A08400	8,400	.3307	103	61	49	1,4	40	10	4158870
TDS412A08500	8,500	.3346	103	61	49	1,4	40	10	4158872

TDS412A • 5 x D

(continued)



● first choice
○ alternate choice

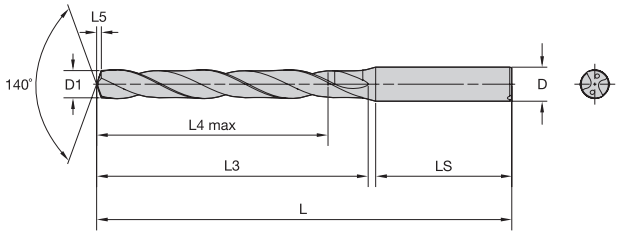
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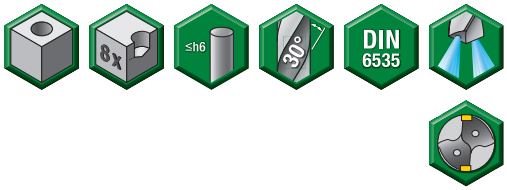
D1 diameter

catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WK15PD
TDS412A08600	8,600	.3386	103	61	49	1,5	40	10	4158873
TDS412A08700	8,700	.3425	103	61	49	1,5	40	10	4158874
TDS412A08800	8,800	.3465	103	61	49	1,5	40	10	4158876
TDS412A08900	8,900	.3504	103	61	49	1,5	40	10	4158877
TDS412A09000	9,000	.3543	103	61	49	1,5	40	10	4158878
TDS412A09100	9,100	.3583	103	61	49	1,5	40	10	4158879
TDS412A09200	9,200	.3622	103	61	49	1,6	40	10	4158881
TDS412A09300	9,300	.3661	103	61	49	1,6	40	10	4158882
TDS412A09400	9,400	.3701	103	61	49	1,6	40	10	4158884
TDS412A09500	9,500	.3740	103	61	49	1,6	40	10	4158885
TDS412A09600	9,600	.3780	103	61	49	1,6	40	10	4158887
TDS412A09700	9,700	.3819	103	61	49	1,7	40	10	4158888
TDS412A09800	9,800	.3858	103	61	49	1,7	40	10	4158889
TDS412A09900	9,900	.3898	103	61	49	1,7	40	10	4158890
TDS412A10000	10,000	.3937	103	61	49	1,7	40	10	4156602
TDS412A10100	10,100	.3976	118	71	56	1,7	45	12	4156733
TDS412A10200	10,200	.4016	118	71	56	1,7	45	12	4156734
TDS412A10300	10,300	.4055	118	71	56	1,8	45	12	4156735
TDS412A10400	10,400	.4094	118	71	56	1,8	45	12	4156737
TDS412A10500	10,500	.4134	118	71	56	1,8	45	12	4156738
TDS412A10600	10,600	.4173	118	71	56	1,8	45	12	4156739
TDS412A10700	10,700	.4213	118	71	56	1,8	45	12	4156740
TDS412A10800	10,800	.4252	118	71	56	1,8	45	12	4156742
TDS412A10900	10,900	.4291	118	71	56	1,9	45	12	4156743
TDS412A11000	11,000	.4331	118	71	56	1,9	45	12	4156744
TDS412A11100	11,100	.4370	118	71	56	1,9	45	12	4156745
TDS412A11200	11,200	.4409	118	71	56	1,9	45	12	4156747
TDS412A11300	11,300	.4449	118	71	56	1,9	45	12	4156748
TDS412A11400	11,400	.4488	118	71	56	2,0	45	12	4156749
TDS412A11500	11,500	.4528	118	71	56	2,0	45	12	4156750
TDS412A11600	11,600	.4567	118	71	56	2,0	45	12	4156752
TDS412A11700	11,700	.4606	118	71	56	2,0	45	12	4156753
TDS412A11800	11,800	.4646	118	71	56	2,0	45	12	4156754
TDS412A11900	11,900	.4685	118	71	56	2,0	45	12	4156755
TDS412A12000	12,000	.4724	118	71	56	2,1	45	12	4156757
TDS412A12100	12,100	.4764	124	77	60	2,1	45	14	4156758
TDS412A12200	12,200	.4803	124	77	60	2,1	45	14	4156759
TDS412A12300	12,300	.4843	124	77	60	2,1	45	14	4156760
TDS412A12400	12,400	.4882	124	77	60	2,1	45	14	4156762
TDS412A12500	12,500	.4921	124	77	60	2,1	45	14	4156763
TDS412A12600	12,600	.4961	124	77	60	2,2	45	14	4156764
TDS412A12700	12,700	.5000	124	77	60	2,2	45	14	4156765
TDS412A12800	12,800	.5039	124	77	60	2,2	45	14	4156766
TDS412A12900	12,900	.5079	124	77	60	2,2	45	14	4156767
TDS412A13000	13,000	.5118	124	77	60	2,2	45	14	4156768
TDS412A13100	13,100	.5157	124	77	60	2,3	45	14	4156770
TDS412A13200	13,200	.5197	124	77	60	2,3	45	14	4156771
TDS412A13300	13,300	.5236	124	77	60	2,3	45	14	4156772
TDS412A13400	13,400	.5276	124	77	60	2,3	45	14	4156773
TDS412A13500	13,500	.5315	124	77	60	2,3	45	14	4156774
TDS412A13600	13,600	.5354	124	77	60	2,3	45	14	4156775
TDS412A13700	13,700	.5394	124	77	60	2,4	45	14	4156776
TDS412A13800	13,800	.5433	124	77	60	2,4	45	14	4156777
TDS412A13900	13,900	.5472	124	77	60	2,4	45	14	4156779
TDS412A14000	14,000	.5512	124	77	60	2,4	45	14	4156780
TDS412A14200	14,200	.5591	133	83	63	2,5	48	16	4156782
TDS412A14300	14,300	.5630	133	83	63	2,5	48	16	4156784
TDS412A14500	14,500	.5709	133	83	63	2,5	48	16	4156786
TDS412A14700	14,700	.5787	133	83	63	2,5	48	16	4156789
TDS412A15000	15,000	.5906	133	83	63	2,6	48	16	4156792
TDS412A16000	16,000	.6299	133	83	63	2,8	48	16	4156805
TDS412A16500	16,500	.6496	143	93	71	2,9	48	18	4156811
TDS412A17000	17,000	.6693	143	93	71	2,9	48	18	4156817
TDS412A17500	17,500	.6890	143	93	71	3,0	48	18	4156823
TDS412A18000	18,000	.7087	143	93	71	3,1	48	18	4156853
TDS412A19000	19,000	.7480	153	101	77	3,3	50	20	4156865
TDS412A20000	20,000	.7874	153	101	77	3,5	50	20	4156876

TDS403A • 8 x D







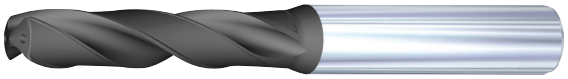
● first choice
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catalogue number	D1 diameter mm	D1 diameter in	L	L3	L4 max	L5	LS	D	WP20PD
TDS403A04700	4,700	.1850	87	49	41	0,8	36	6	**4163196**
TDS403A08000	8,000	.3150	110	72	61	1,4	36	8	**4163244**

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Application Data • TDS Series • WM15PD™ • Through Coolant • Metric



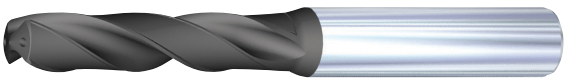
Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate (f) by Diameter								
		min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	0	80	–	160	mm/r	0,05–0,11	0,08–0,14	0,09–0,19	0,11–0,22	0,13–0,26	0,15–0,30	0,19–0,36	0,24–0,46
	1	70	–	140	mm/r	0,05–0,13	0,08–0,19	0,11–0,24	0,14–0,30	0,16–0,35	0,18–0,39	0,20–0,46	0,23–0,51
	2	90	–	140	mm/r	0,05–0,13	0,08–0,17	0,11–0,20	0,14–0,24	0,16–0,28	0,18–0,32	0,20–0,37	0,23–0,41
	3	60	–	100	mm/r	0,08–0,13	0,12–0,19	0,14–0,24	0,17–0,30	0,20–0,35	0,22–0,39	0,26–0,46	0,29–0,51
	4	50	–	100	mm/r	0,08–0,12	0,11–0,18	0,12–0,23	0,15–0,28	0,17–0,33	0,19–0,37	0,22–0,43	0,25–0,48
	5	50	–	80	mm/r	0,03–0,11	0,04–0,11	0,05–0,11	0,05–0,14	0,08–0,18	0,11–0,21	0,14–0,24	0,16–0,26
	6	40	–	70	mm/r	0,05–0,11	0,08–0,14	0,11–0,17	0,13–0,21	0,15–0,24	0,17–0,27	0,19–0,33	0,22–0,36
M	1	50	–	90	mm/r	0,05–0,13	0,06–0,14	0,08–0,16	0,10–0,18	0,12–0,20	0,13–0,21	0,16–0,24	0,18–0,26
	2	50	–	80	mm/r	0,05–0,13	0,06–0,14	0,08–0,16	0,10–0,18	0,12–0,20	0,13–0,21	0,16–0,24	0,18–0,26
	3	50	–	70	mm/r	0,05–0,13	0,06–0,14	0,08–0,16	0,10–0,18	0,12–0,20	0,13–0,21	0,16–0,24	0,18–0,26
S	1	20	–	30	mm/r	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	2	10	–	30	mm/r	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	3	10	–	40	mm/r	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	4	10	–	40	mm/r	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16

Application Data • TDS Series • WP20PD™ • Through Coolant • Metric



Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate (f) by Diameter								
		min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	80	–	180	mm/r	0,08–0,16	0,11–0,19	0,13–0,26	0,16–0,32	0,16–0,36	0,21–0,40	0,24–0,47	0,29–0,58
	2, 3, 4, 6, 7	80	–	160	mm/r	0,09–0,17	0,11–0,20	0,13–0,26	0,16–0,32	0,20–0,36	0,23–0,40	0,29–0,50	0,36–0,63
	5, 9, 10, 11	80	–	140	mm/r	0,08–0,17	0,11–0,20	0,12–0,26	0,15–0,32	0,18–0,35	0,21–0,40	0,25–0,50	0,30–0,63
	12, 13.1, 13.2	50	–	80	mm/r	0,06–0,11	0,08–0,13	0,11–0,21	0,10–0,23	0,13–0,25	0,14–0,28	0,29–0,33	0,25–0,44
M	14.1	40	–	60	mm/r	0,05–0,09	0,06–0,12	0,08–0,14	0,09–0,16	0,11–0,18	0,13–0,21	0,15–0,23	0,17–0,26
	14.3	40	–	70	mm/r	0,05–0,11	0,07–0,13	0,09–0,14	0,11–0,19	0,11–0,21	0,13–0,23	0,15–0,26	0,17–0,29
	14.2, 14.4	35	–	50	mm/r	0,05–0,09	0,07–0,12	0,08–0,13	0,09–0,16	0,11–0,18	0,13–0,20	0,15–0,22	0,17–0,26

Application Data • TDS Series • WK15PD™ • Through Coolant • Metric

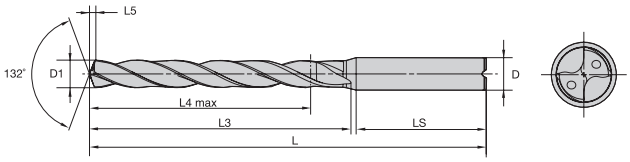


Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate (f) by Diameter								
		min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
K	15, 16	80	–	190	mm/r	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	17, 18, 19	90	–	170	mm/r	0,12–0,16	0,13–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	20	80	–	150	mm/r	0,08–0,17	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60

	Metric tolerance	
nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

TDS504A • 12 x D







● first choice
○ alternate choice

P		●
M		●
K		●
N		
S		○
H		

	D1 diameter								
catalogue number	mm	in	L	L3	L4 max	L5	LS	D	WU20PD
TDS504A03000	3,000	.1181	93	52	44	0,6	36	6	4173459
TDS504A03500	3,500	.1378	93	53	44	0,7	36	6	4173462
TDS504A04000	4,000	.1575	107	66	56	0,8	36	6	4173464
TDS504A04500	4,500	.1772	107	67	56	0,9	36	6	4173465
TDS504A04600	4,600	.1811	107	68	57	1,0	36	6	4173466
TDS504A04800	4,800	.1890	125	82	69	1,0	36	6	4173468
TDS504A05000	5,000	.1969	125	83	70	1,1	36	6	4173469
TDS504A05100	5,100	.2008	125	83	70	1,1	36	6	4173470
TDS504A05200	5,200	.2047	125	83	70	1,1	36	6	4173471
TDS504A05300	5,300	.2087	125	84	71	1,1	36	6	4173472
TDS504A05500	5,500	.2165	125	84	71	1,2	36	6	4173474
TDS504A05600	5,600	.2205	125	85	72	1,2	36	6	4173476
TDS504A05700	5,700	.2244	125	85	72	1,2	36	6	4173477
TDS504A05800	5,800	.2283	125	85	71	1,2	36	6	4173478
TDS504A06000	6,000	.2362	125	86	72	1,3	36	6	4173479
TDS504A06200	6,200	.2441	139	97	82	1,3	36	8	4173480
TDS504A06500	6,500	.2559	139	98	83	1,4	36	8	4173482
TDS504A06600	6,600	.2598	139	99	84	1,4	36	8	4173484
TDS504A06800	6,800	.2677	139	99	83	1,4	36	8	4173486
TDS504A07000	7,000	.2756	139	100	84	1,5	36	8	4173488
TDS504A07500	7,500	.2953	153	112	95	1,6	36	8	4173490
TDS504A07700	7,700	.3031	153	113	96	1,6	36	8	4173492
TDS504A07800	7,800	.3071	153	113	95	1,7	36	8	4173493
TDS504A08000	8,000	.3150	153	114	96	1,7	36	8	4173495
TDS504A08100	8,100	.3189	185	136	116	1,7	40	10	4173496
TDS504A08500	8,500	.3346	185	137	117	1,8	40	10	4173499
TDS504A08700	8,700	.3425	185	138	118	1,9	40	10	4173500
TDS504A09000	9,000	.3543	185	139	118	1,9	40	10	4173502
TDS504A09100	9,100	.3583	185	139	118	1,9	40	10	4173503
TDS504A09500	9,500	.3740	185	140	119	2,0	40	10	4173505
TDS504A10000	10,000	.3937	185	142	120	2,1	40	10	4173508
TDS504A10200	10,200	.4016	218	164	140	2,2	45	12	4173509
TDS504A10300	10,300	.4055	218	165	141	2,2	45	12	4173510
TDS504A10500	10,500	.4134	218	165	141	2,2	45	12	4173512
TDS504A10800	10,800	.4252	218	166	141	2,3	45	12	4173514
TDS504A11000	11,000	.4331	218	167	142	2,4	45	12	4173515
TDS504A11500	11,500	.4528	218	168	143	2,5	45	12	4173517
TDS504A11800	11,800	.4646	218	169	143	2,5	45	12	4173518
TDS504A12000	12,000	.4724	218	170	144	2,6	45	12	4173519
TDS504A12100	12,100	.4764	246	192	164	2,6	45	14	4173520
TDS504A12500	12,500	.4921	246	193	165	2,7	45	14	4148906
TDS504A12700	12,700	.5000	246	194	166	2,7	45	14	4173522
TDS504A13000	13,000	.5118	246	195	166	2,8	45	14	4173523
TDS504A13100	13,100	.5157	246	195	166	2,8	45	14	4173524
TDS504A13500	13,500	.5315	246	196	167	2,9	45	14	4173525
TDS504A14000	14,000	.5512	246	198	168	3,0	45	14	4173526
TDS504A14100	14,100	.5551	277	220	188	3,0	48	16	4173527
TDS504A14500	14,500	.5709	277	221	189	3,1	48	16	4173529
TDS504A15000	15,000	.5906	277	223	190	3,2	48	16	4173531
TDS504A15500	15,500	.6102	277	224	191	3,3	48	16	4173532
TDS504A16000	16,000	.6299	277	226	192	3,4	48	16	4173534
TDS504A16500	16,500	.6496	305	249	213	3,6	48	18	4173535
TDS504A17000	17,000	.6693	305	250	214	3,7	48	18	4173536
TDS504A17500	17,500	.6890	305	252	215	3,8	48	18	4173538
TDS504A18000	18,000	.7087	305	253	216	3,9	48	18	4173539
TDS504A18500	18,500	.7283	334	277	237	4,0	50	20	4173540
TDS504A19000	19,000	.7480	334	278	238	4,1	50	20	4173541
TDS504A19500	19,500	.7677	334	280	239	4,2	50	20	4173543
TDS504A20000	20,000	.7874	334	281	240	4,3	50	20	4173544

Application Data • TDS+ Series • WU20PD™ • Through Coolant • Metric

Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate (f) by Diameter							
		min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	90	–	180	mm/r	0,08–0,16	0,09–0,18	0,12–0,24	0,14–0,29	0,17–0,34	0,20–0,39	0,24–0,47	0,31–0,60
	2, 3, 4, 6, 7	80	–	120	mm/r	0,09–0,17	0,10–0,19	0,14–0,25	0,17–0,31	0,21–0,37	0,24–0,42	0,29–0,52	0,38–0,65
	5, 9, 10, 11	70	–	120	mm/r	0,08–0,17	0,09–0,19	0,13–0,25	0,16–0,31	0,19–0,37	0,21–0,42	0,26–0,52	0,32–0,65
	12, 13	50	–	80	mm/r	0,05–0,09	0,06–0,11	0,09–0,16	0,11–0,20	0,14–0,24	0,15–0,27	0,20–0,35	0,26–0,45
M	14,1	30	–	50	mm/r	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	14,3	30	–	60	mm/r	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	14.2, 14.4	30	–	50	mm/r	0,04–0,07	0,06–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	15, 16	100	–	210	mm/r	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	17, 18, 19	130	–	160	mm/r	0,11–0,17	0,12–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	20	100	–	170	mm/r	0,08–0,17	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60

	Metric tolerance	
nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

TOP DRILL™ Deep-Hole Drills

The TDD deep-hole drill series in the WU20PD™ grade offers secure and consistent performance, excellent hole quality, and reduced cycle times.

Solid carbide deep-hole drills outperform gun drills and HSS deep-hole drills in deep-hole applications up to 30 x D by increasing metal removal rates by 3–4 times. Increased MRR equals bottom-line savings to customers in throughput, machine time, and personnel hours.

Choose TDS Drill Series for piloting.

- Helix with optimised flute profile reduces risk of chip jamming and catastrophic failure.
- Four-margin lands to improve hole straightness and alignment through cross holes and inclined exits.
- Advances TiAlN multilayer PVD coating for steel and cast iron.

Materials:

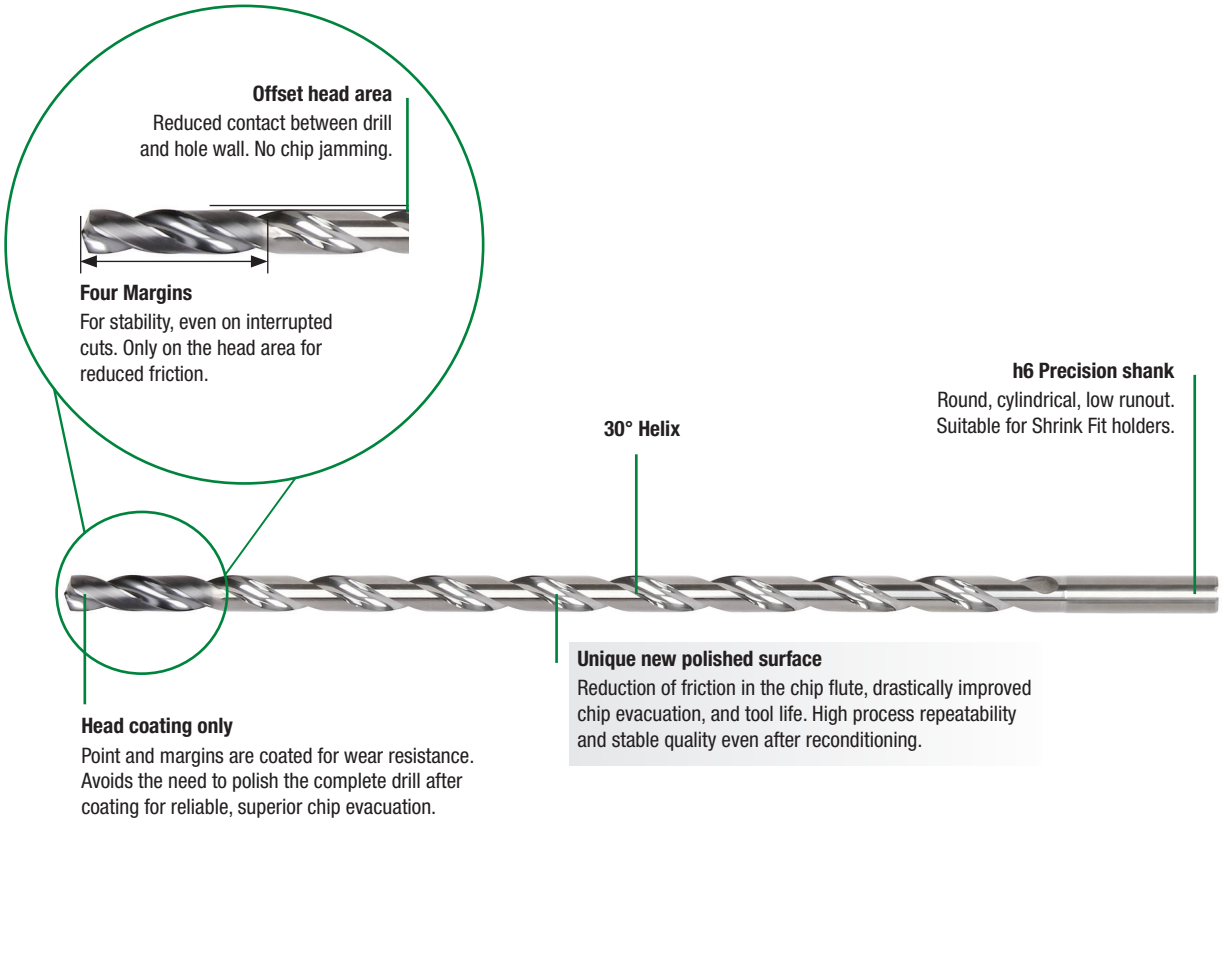
P K

Lengths
Available with and without through coolant channels.

30x

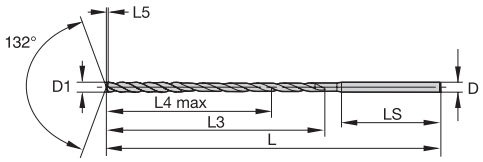
Diameter Range
3–13mm

Grade:
WU20PD





TDD105 • 15 x D • Metric





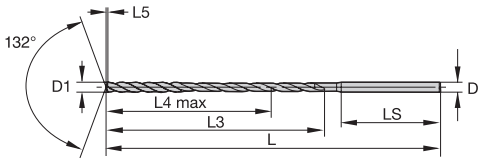
● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
H		

	D1 diameter									
catalogue number	mm	in	D	L3	L4 max	L5	LS	L	pilot drill	WU20PD
TDD105Z03000	3,000	.1181	3	52	45	0,6	30	86	**TDS501A03000**	**3899626**
TDD105Z03500	3,500	.1378	4	68	59	0,7	32	105	**TDS501A03500**	**3899628**
TDD105Z04000	4,000	.1575	4	70	60	0,8	32	105	**TDS501A04000**	**3899632**
TDD105Z04500	4,500	.1772	5	85	74	0,9	34	124	**TDS501A04500**	**3899685**
TDD105Z05000	5,000	.1969	5	87	75	1,0	34	124	**TDS501A05000**	**3899688**
TDD105Z05500	5,500	.2165	6	102	89	1,1	36	143	**TDS501A05500**	**3899691**
TDD105Z06000	6,000	.2362	6	104	90	1,2	36	143	**TDS501A06000**	**3899694**
TDD105Z06500	6,500	.2559	7	119	104	1,4	38	162	**TDS501A06500**	**3899697**
TDD105Z06800	6,800	.2677	7	120	104	1,4	38	162	**TDS501A06800**	**3899700**
TDD105Z07000	7,000	.2756	7	121	105	1,5	38	162	**TDS501A07000**	**3899702**
TDD105Z07500	7,500	.2953	8	136	119	1,6	40	181	**TDS501A07500**	**3900633**
TDD106Z07500	7,500	.2953	8	174	157	1,6	40	221	**TDS501A07500**	**3899764**
TDD105Z08000	8,000	.3150	8	138	120	1,7	40	181	**TDS501A08000**	**3900636**
TDD105Z08500	8,500	.3346	9	153	134	1,8	42	200	**TDS501A08500**	**3900639**
TDD105Z09000	9,000	.3543	9	155	135	1,9	42	200	**TDS501A09000**	**3900641**
TDD105Z09500	9,500	.3740	10	170	149	2,0	44	219	**TDS501A09500**	**3900643**
TDD105Z10000	10,000	.3937	10	172	150	2,1	44	219	**TDS501A10000**	**3900647**
TDD105Z10500	10,500	.4134	11	187	164	2,2	46	238	**TDS501A10500**	**3900650**
TDD105Z11000	11,000	.4331	11	189	165	2,3	46	238	**TDS501A11000**	**3900652**
TDD105Z11500	11,500	.4528	12	204	179	2,4	48	257	**TDS501A11500**	**3900654**
TDD105Z12000	12,000	.4724	12	206	180	2,5	48	257	**TDS501A12000**	**3900656**
TDD105Z13000	13,000	.5118	13	223	195	2,8	50	276	**TDS501A13000**	**3900660**

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TDD106 • 20 x D • Metric



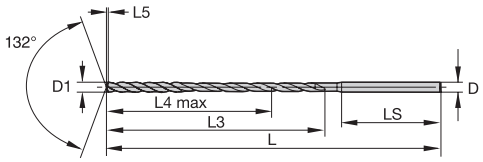


● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
H		

catalogue number	D1 diameter mm	D1 diameter in	D	L3	L4 max	L5	LS	L	pilot drill	WU20PD
TDD106Z03000	3,000	.1181	3	67	60	0,6	30	101	**TDS501A03000**	**3899782**
TDD106Z03500	3,500	.1378	4	86	77	0,7	32	125	**TDS501A03500**	**3899804**
TDD106Z04000	4,000	.1575	4	90	80	0,8	32	125	**TDS501A04000**	**3899808**
TDD106Z04500	4,500	.1772	5	108	97	0,9	34	149	**TDS501A04500**	**3899811**
TDD106Z05000	5,000	.1969	5	112	100	1,0	34	149	**TDS501A05000**	**3899814**
TDD106Z05500	5,500	.2165	6	130	117	1,1	36	173	**TDS501A05500**	**3899818**
TDD106Z06000	6,000	.2362	6	134	120	1,2	36	173	**TDS501A06000**	**3899821**
TDD106Z06500	6,500	.2559	7	152	137	1,4	38	197	**TDS501A06500**	**3899824**
TDD106Z06800	6,800	.2677	7	154	138	1,4	38	197	**TDS501A06800**	**3899827**
TDD106Z07000	7,000	.2756	7	156	140	1,5	38	197	**TDS501A07000**	**3899829**
TDD106Z08000	8,000	.3150	8	178	160	1,7	40	221	**TDS501A08000**	**3899767**
TDD106Z08500	8,500	.3346	9	196	177	1,8	42	245	**TDS501A08500**	**3899770**
TDD106Z09000	9,000	.3543	9	200	180	1,9	42	245	**TDS501A09000**	**3899772**
TDD106Z09500	9,500	.3740	10	218	197	2,0	44	269	**TDS501A09500**	**3899784**
TDD106Z10000	10,000	.3937	10	222	200	2,1	44	269	**TDS501A10000**	**3899788**
TDD106Z10500	10,500	.4134	11	240	217	2,2	46	293	**TDS501A10500**	**3899791**
TDD106Z11000	11,000	.4331	11	244	220	2,3	46	293	**TDS501A11000**	**3899793**
TDD106Z11500	11,500	.4528	12	262	237	2,4	48	317	**TDS501A11500**	**3899795**
TDD106Z12000	12,000	.4724	12	266	240	2,5	48	317	**TDS501A12000**	**3899797**
TDD106Z12500	12,500	.4921	13	284	257	2,7	50	341	**TDS501A12500**	**3899799**
TDD106Z13000	13,000	.5118	13	288	260	2,8	50	341	**TDS501A13000**	**3899801**

TDD107 • 25 x D • Metric





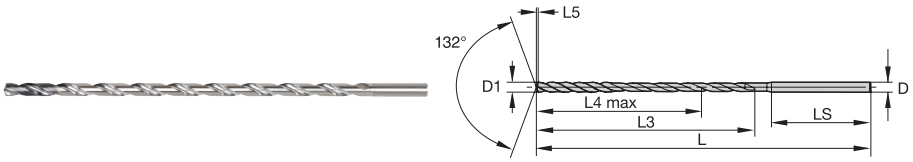
● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
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	D1 diameter									
catalogue number	mm	in	D	L3	L4 max	L5	LS	L	pilot drill	WU20PD
TDD107Z03000	3,000	.1181	3	82	75	0,6	30	116	**TDS501A03000**	**3899708**
TDD107Z03500	3,500	.1378	4	103	94	0,7	32	145	**TDS501A03500**	**3899710**
TDD107Z04000	4,000	.1575	4	110	100	0,8	32	145	**TDS501A04000**	**3899734**
TDD107Z04500	4,500	.1772	5	130	119	0,9	34	174	**TDS501A04500**	**3899737**
TDD107Z05000	5,000	.1969	5	137	125	1,0	34	174	**TDS501A05000**	**3899740**
TDD107Z05500	5,500	.2165	6	157	144	1,1	36	203	**TDS501A05500**	**3899743**
TDD107Z06000	6,000	.2362	6	164	150	1,2	36	203	**TDS501A06000**	**3899746**
TDD107Z06500	6,500	.2559	7	184	169	1,4	38	232	**TDS501A06500**	**3899749**
TDD107Z07000	7,000	.2756	7	191	175	1,5	38	232	**TDS501A07000**	**3899754**
TDD107Z08000	8,000	.3150	8	218	200	1,7	40	261	**TDS501A08000**	**3899569**
TDD107Z08500	8,500	.3346	9	238	219	1,8	42	290	**TDS501A08500**	**3899572**
TDD107Z09000	9,000	.3543	9	245	225	1,9	42	290	**TDS501A09000**	**3899604**
TDD107Z09500	9,500	.3740	10	265	244	2,0	44	319	**TDS501A09500**	**3899606**
TDD107Z10000	10,000	.3937	10	272	250	2,1	44	319	**TDS501A10000**	**3899610**
TDD107Z10300	10,300	.4055	11	290	267	2,2	46	348	**TDS501A10300**	**3899611**
TDD107Z10500	10,500	.4134	11	292	269	2,2	46	348	**TDS501A10500**	**3899613**
TDD107Z11000	11,000	.4331	11	299	275	2,3	46	348	**TDS501A11000**	**3899615**
TDD107Z11500	11,500	.4528	12	319	294	2,4	48	377	**TDS501A11500**	**3899617**
TDD107Z12000	12,000	.4724	12	326	300	2,5	48	377	**TDS501A12000**	**3899619**
TDD107Z12500	12,500	.4921	13	346	319	2,7	50	406	**TDS501A12500**	**3899621**
TDD107Z13000	13,000	.5118	13	353	325	2,8	50	406	**TDS501A13000**	**3899623**

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TDD108 • 30 x D • Metric





● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
H		

	D1 diameter									
catalogue number	mm	in	D	L3	L4 max	L5	LS	L	pilot drill	WU20PD
TDD108Z03000	3,000	.1181	3	97	90	0,6	30	131	TDS501A03000	3899539
TDD108Z03500	3,500	.1378	4	121	112	0,7	32	165	TDS501A03500	3899541
TDD108Z04000	4,000	.1575	4	130	120	0,8	32	165	TDS501A04000	3899575
TDD108Z04500	4,500	.1772	5	153	142	0,9	34	199	TDS501A04500	3899578
TDD108Z05000	5,000	.1969	5	162	150	1,0	34	199	TDS501A05000	3899581
TDD108Z05500	5,500	.2165	6	185	172	1,1	36	233	TDS501A05500	3899584
TDD108Z06000	6,000	.2362	6	194	180	1,2	36	233	TDS501A06000	3899587
TDD108Z06500	6,500	.2559	7	217	202	1,4	38	267	TDS501A06500	3899590
TDD108Z06800	6,800	.2677	7	222	206	1,4	38	267	TDS501A06800	3899593
TDD108Z07000	7,000	.2756	7	226	210	1,5	38	267	TDS501A07000	3899595
TDD108Z07500	7,500	.2953	8	249	232	1,6	40	301	TDS501A07500	3899601
TDD108Z08000	8,000	.3150	8	258	240	1,7	40	301	TDS501A08000	3899654
TDD108Z08500	8,500	.3346	9	281	262	1,8	42	335	TDS501A08500	3899657
TDD108Z09000	9,000	.3543	9	290	270	1,9	42	335	TDS501A09000	3899659
TDD108Z09500	9,500	.3740	10	313	292	2,0	44	369	TDS501A09500	3899661
TDD108Z10000	10,000	.3937	10	322	300	2,1	44	369	TDS501A10000	3899665
TDD108Z10500	10,500	.4134	11	345	322	2,2	46	403	TDS501A10500	3899668
TDD108Z11000	11,000	.4331	11	354	330	2,3	46	403	TDS501A11000	3899670
TDD108Z11500	11,500	.4528	12	377	352	2,4	48	437	TDS501A11500	3899672
TDD108Z12000	12,000	.4724	12	386	360	2,5	48	437	TDS501A12000	3899674
TDD108Z12500	12,500	.4921	13	409	382	2,7	50	471	TDS501A12500	3899676
TDD108Z13000	13,000	.5118	13	418	390	2,8	50	471	TDS501A13000	3899678

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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Application Data • TDD Series • WU20PD™ • Through Coolant • Metric

Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate (fz) by Diameter								
		min		max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	90	–	130	mm/r	0,08–0,12	0,12–0,18	0,18–0,20	0,20–0,22	0,22–0,25	0,25–0,28	0,28–0,30	0,30–0,34
	2	80	–	115	mm/r	0,08–0,12	0,12–0,18	0,18–0,20	0,20–0,22	0,22–0,25	0,25–0,28	0,28–0,30	0,30–0,34
	3	70	–	110	mm/r	0,05–0,10	0,10–0,16	0,16–0,18	0,18–0,20	0,20–0,22	0,22–0,24	0,24–0,26	0,26–0,28
	4	65	–	95	mm/r	0,05–0,10	0,10–0,16	0,16–0,18	0,18–0,20	0,20–0,22	0,22–0,24	0,24–0,26	0,26–0,28
K	1	105	–	145	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38
	2	85	–	120	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38
	3	100	–	140	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38

MODULAR DRILLS

TDMX

Pages C46–C49

Stability and reliability combined into one modular drill system.





TDM1

Pages C50–C56

With its high level of performance, wide application range, and proven point geometry, TDM1 modular drill systems combine all of the economic benefits of a modular drilling system with the machining performance and hole quality to tackle even your most challenging operations.

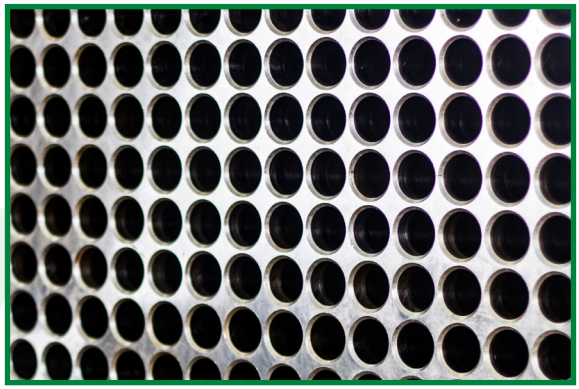
ALL-STAR

TUBE SHEET DRILLING SUCCESS

ENERGY



TDMX



TUBE SHEET

WIDIA™
SHINING
MOMENT

LONGER TOOL LIFE WITH LOWER SPINDLE LOAD AND BETTER CHIP CONTROL

Proven Solution — Tube Sheet

P

Material: ST52

Condition: Pre-Drilled

	COMPETITOR	WIDIA
Insert	–	TDMX2576PKM
Diameter	25,76mm (1,014")	25,76mm (1,014")
Grade	–	WP40PD
Body	–	TDMX250SL32R5M
Length	5 x D	5 x D
Vc	100m/min (320 SFM)	100m/min (320 SFM)
RPM	1239 r/min	1239 r/min
f	0,3mm/r (.011 ipm)	0,3mm/r (.011 IPR)
Vf	371mm/min (14 ipm)	371mm/min (14 ipm)
LOC	77mm (3.03")	77mm (3.03")
Tool Life	390 holes	428 holes

TO SEE ALL PRODUCT LINES, VISIT OUR DIGITAL RESOURCES

WIDIA NOVO™ Application
Download to your desktop or tablet:
widia.com/novo

WIDIA™ Machining Central Mobile App
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TDMX — TOP DRILL™ Modular X

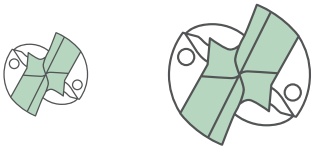
WIDIA™ TOP DRILL Modular X (TDMX) drilling solutions are the ultimate choice for high-demanding drilling applications when stability and reliability are required.

- Easy to apply, increased stability and performance.
- Highly engineered pocket seat design to ensure maximum stability, even in challenging applications like cross hole, inclined entry/exit, and interrupted cuts.
- Suitable for high feed rates.
- Brand new WP40PD grade for longer tool life in steel and cast iron applications.
- Easy insert nomenclature logic to identify the targeted material group.

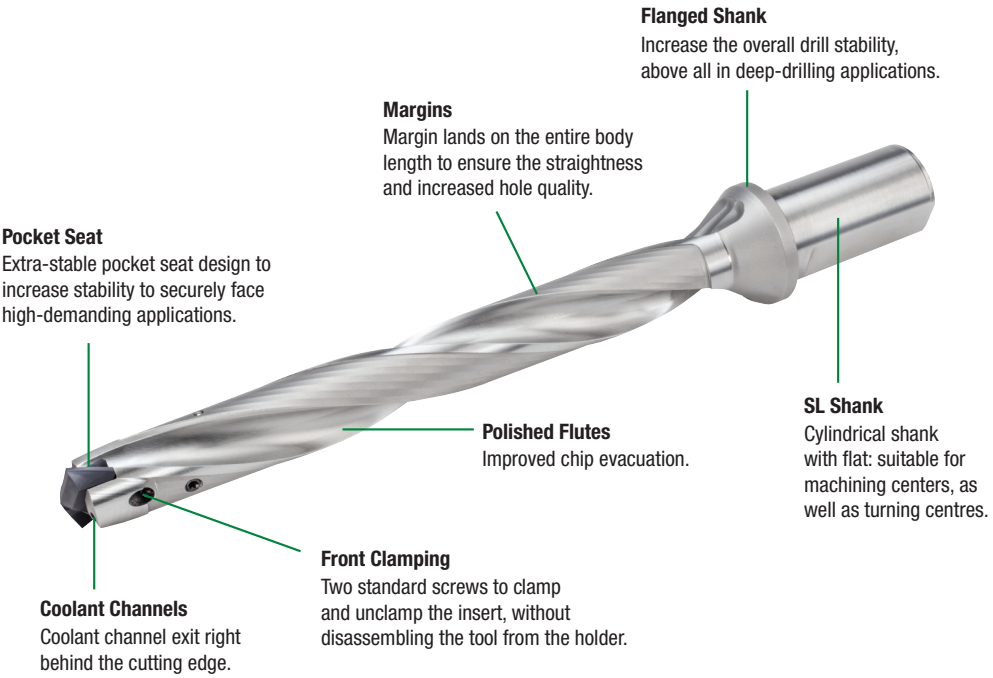
L/D Ratio



Diameter range
16–40mm



Grade:
WP40PD



One geometry to cover two material groups in modular drilling.

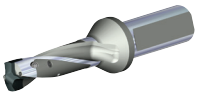
PK

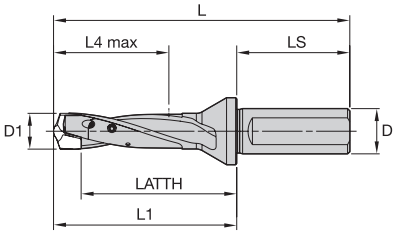


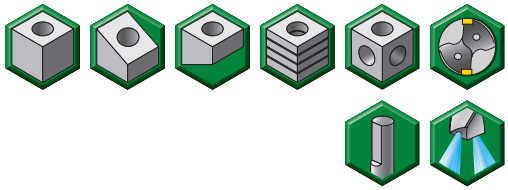
P K

First choice for Steel and Cast Iron drilling.

TDMX • 3 x D • Side Lock Shank • Metric





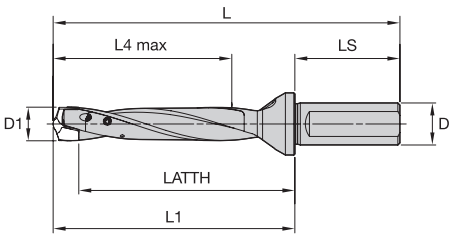


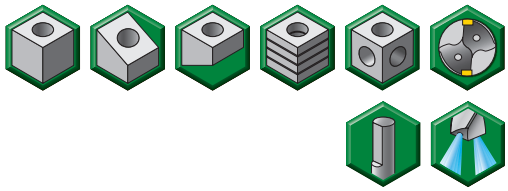
order number	catalogue number	SSC	D1	D1 max
6572091	TDMX160R3SL20M	A	16,000	16,999
6572092	TDMX170R3SL20M	B	17,000	17,999
6572093	TDMX180R3SL25M	C	18,000	18,999
6572094	TDMX190R3SL25M	D	19,000	19,999
6572096	TDMX200R3SL25M	E	20,000	20,999
6572097	TDMX210R3SL25M	F	21,000	21,999
6572098	TDMX220R3SL25M	G	22,000	22,999
6572101	TDMX250R3SL32M	J	25,000	25,999
6572102	TDMX260R3SL32M	K	26,000	26,999
6572104	TDMX270R3SL32M	L	27,000	27,999
6572107	TDMX300R3SL32M	O	30,000	30,999
6572109	TDMX320R3SL40M	Q	32,000	33,999

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

TDMX • 5 x D • Side Lock Shank • Metric







order number	catalogue number	SSC	D1	D1 max
6572125	TDMX160R5SL20M	A	16,000	16,999
6572126	TDMX170R5SL20M	B	17,000	17,999
6572128	TDMX190R5SL25M	D	19,000	19,999
6572129	TDMX200R5SL25M	E	20,000	20,999
6572145	TDMX260R5SL32M	K	26,000	26,999
6572147	TDMX280R5SL32M	M	28,000	28,999

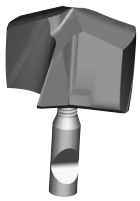
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

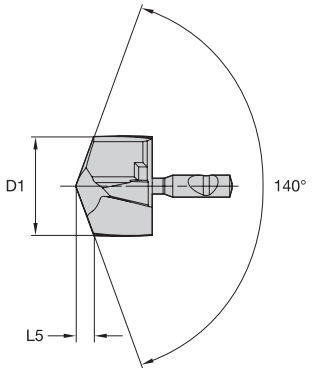
TDMX • Dimensions

	mm Ø				SHORT ~3 x D				LONG ~5 x D			
SSC	D1 min	D1 max	LS	D	LATTH	L	L1	L4 max	LATTH	L	L1	L4 max
A	16,000	16,999	50	20	68,8	131	81	51	102,8	165	115	85
B	17,000	17,999	50	20	73,8	136	86	54	109,8	172	122	90
C	18,000	18,999	56	25	76,7	146	90	57	114,7	184	128	95
D	19,000	19,999	56	25	81,7	151	95	60	121,7	191	135	100
E	20,000	20,999	56	25	84,6	155	99	63	126,6	197	141	105
F	21,000	21,999	56	25	89,6	160	104	66	133,6	204	148	110
G	22,000	22,999	56	25	92,5	164	108	69	138,5	210	154	115
J	25,000	25,999	60	32	105,4	182	122	78	157,4	234	174	130
K	26,000	26,999	60	32	108,3	186	126	81	162,3	240	180	135
L	27,000	27,999	60	32	113,3	191	131	84	169,3	247	187	140
M	28,000	28,999	60	32	116,2	195	135	87	174,2	253	193	145
O	30,000	30,999	60	32	124,1	204	144	93	186,1	266	206	155
Q	32,000	33,999	70	40	136,0	228	158	102	204,0	296	226	170

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

TDMX • Inserts • PK(M)





● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
H		

catalogue number	D1	L5	SSC	WP40PD
TDMX16000PKM	16,00	3,21	A	**6568446**
TDMX16500PKM	16,50	3,30	A	**6568449**
TDMX17000PKM	17,00	3,39	B	**6568461**
TDMX18000PKM	18,00	3,58	C	**6568473**
TDMX18500PKM	18,50	3,68	C	**6568475**
TDMX19000PKM	19,00	3,78	D	**6568478**
TDMX19500PKM	19,50	3,87	D	**6568483**
TDMX20000PKM	20,00	3,97	E	**6568813**
TDMX20100PKM	20,10	3,99	E	**6568814**
TDMX20500PKM	20,50	4,06	E	**6568819**
TDMX21000PKM	21,00	4,16	F	**6568845**
TDMX22000PKM	22,00	4,35	G	**6568848**
TDMX22500PKM	22,50	4,44	G	**6568851**
TDMX24000PKM	24,00	4,73	I	**6568856**
TDMX25000PKM	25,00	4,91	J	**6568859**
TDMX26000PKM	26,00	5,11	K	**6568866**
TDMX26500PKM	26,50	5,20	K	**6568869**
TDMX27000PKM	27,00	5,29	L	**6568871**
TDMX30000PKM	30,00	5,87	O	**6568892**
TDMX32000PKM	32,00	6,25	Q	**6568901**

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

	Metric tolerance
D1	**tolerance k8**
8–10	0,000/+0,022
>10–17	0,000/+0,027
>17–18	0,000/+0,027
>18–21	0,000/+0,033

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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Application Data • PK(M) • WP40PD • Metric



Material Group		Cutting Speed — Vc Range — m/min			Recommended Feed Rate (f) by Diameter					
		min	Starting Value	max	Tool Diameter (mm)	16,0	20,0	25,0	32,0	40,0
P	1	90	**125**	170	mm/r	0,19–0,45	0,25–0,48	0,25–0,52	0,28–0,57	0,29–0,60
	2	105	**140**	180	mm/r	0,23–0,46	0,28–0,50	0,30–0,52	0,33–0,57	0,35–0,60
	3	50	**75**	100	mm/r	0,23–0,46	0,28–0,50	0,30–0,52	0,33–0,57	0,35–0,60
	4	50	**75**	100	mm/r	0,19–0,45	0,22–0,48	0,25–0,50	0,28–0,55	0,29–0,58
	5	50	**65**	80	mm/r	0,16–0,32	0,18–0,36	0,22–0,42	0,24–0,46	0,25–0,48
	6	50	**65**	80	mm/r	0,16–0,32	0,18–0,36	0,22–0,42	0,24–0,46	0,25–0,48
M	1	40	**80**	110	mm/r	0,11–0,26	0,13–0,28	0,13–0,32	0,14–0,35	0,15–0,37
	2	35	**55**	75	mm/r	0,11–0,26	0,13–0,28	0,13–0,32	0,14–0,35	0,15–0,37
	3	20	**35**	50	mm/r	0,11–0,26	0,13–0,28	0,13–0,32	0,14–0,35	0,15–0,37
K	1	60	**95**	170	mm/r	0,25–0,48	0,28–0,52	0,32–0,56	0,35–0,62	0,37–0,65
	2	60	**75**	90	mm/r	0,25–0,48	0,28–0,52	0,32–0,56	0,35–0,62	0,37–0,65
	3	40	**65**	90	mm/r	0,21–0,44	0,23–0,48	0,25–0,50	0,28–0,55	0,29–0,58

NOTE: Through coolant recommended for greater than 3 x D applications.
Material group M is recommended for secondary applications.

TOP DRILL M1™ Modular Drill System

With performance levels and metal removal rates comparable to that of solid carbide drills, WIDIA™ TOP DRILL M1 modular drills offer all the quality and performance you need in one versatile, economical package. The unique front clamping system enables inserts to be changed quickly, even inside the machine tool, saving setup time and manufacturing costs.

Easy Insert Change

- No screws or clamps required.
- Insert blades can be changed with a simple wrench that comes with each holder.

Disposable

- No reconditioning costs.
- Consistent performance from tip-to-tip.
- Eliminates number of tools waiting for reconditioning, thus avoiding hidden costs.

The TDM1 platform offers UP(M) drill-point design in WU25PD™ grade — a wide application range geometry, specially developed for cost-efficient drilling of steel, cast iron, and stainless steel.

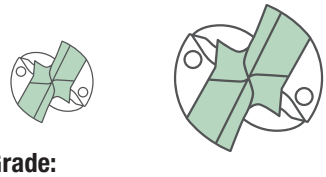
L/D Ratios

Within the standard offering.



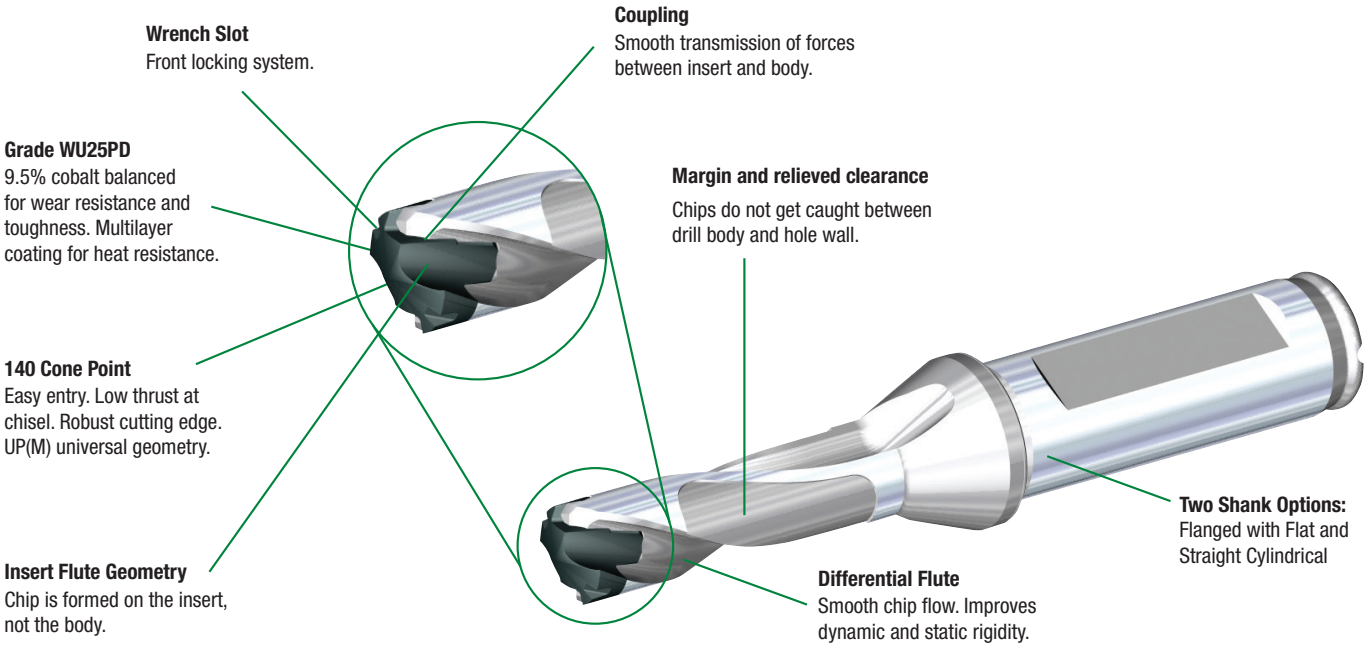
Diameter Range

8–25.99mm



Grade:

WU25PD

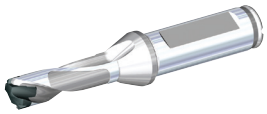


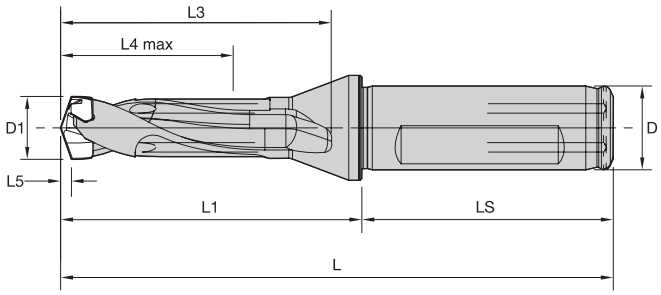
One insert style for all your work in steel, cast iron, and even stainless steels.

- Low cutting forces and excellent centring capabilities.
- Universal point style for consistent performance and excellent hole quality.



TDM1 • 3 x D • Flanged Shank • Metric





round shank (no flats)

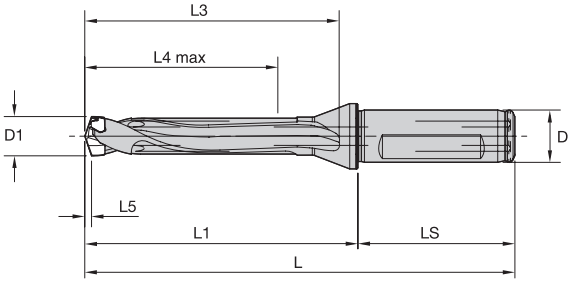
order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	SSC
3850904	TDM080R3SCF12M	7,94	8,49	12	86	41	35	26	1,5	45	W10
3850906	TDM085R3SCF12M	8,50	8,99	12	88	43	37	27	1,6	45	W11
3850908	TDM090R3SCF12M	9,00	9,49	12	90	45	39	29	1,7	45	W12
3850910	TDM095R3SCF12M	9,50	9,99	12	92	47	41	30	1,8	45	W13
3850912	TDM100R3SCF16M	10,00	10,49	16	97	49	43	32	1,9	48	W14
3850924	TDM105R3SCF16M	10,50	10,99	16	99	51	45	33	2,0	48	W15
3850926	TDM110R3SCF16M	11,00	11,49	16	101	53	47	35	2,1	48	W16
3850928	TDM115R3SCF16M	11,50	11,99	16	103	55	49	36	2,2	48	W17
3850930	TDM120R3SCF16M	12,00	12,49	16	106	58	52	38	2,3	48	W18
3850932	TDM125R3SCF16M	12,50	12,99	16	108	60	54	39	2,4	48	W19
3850934	TDM130R3SCF16M	13,00	13,49	16	110	62	56	41	2,5	48	W20
3850936	TDM135R3SCF16M	13,50	13,99	16	112	64	58	42	2,6	48	W21
3850938	TDM140R3SCF16M	14,00	14,49	16	114	66	60	44	2,7	48	W22
3850940	TDM145R3SCF16M	14,50	14,99	16	116	68	62	45	2,8	48	W23
3850942	TDM150R3SCF20M	15,00	15,99	20	122	72	66	48	2,8	50	W24
3850944	TDM160R3SCF20M	16,00	16,99	20	126	76	70	51	3,0	50	W25
3850946	TDM170R3SCF20M	17,00	17,99	20	131	81	75	54	3,2	50	W26
3850948	TDM180R3SCF25M	18,00	18,99	25	141	85	79	57	3,4	56	W27
3850950	TDM190R3SCF25M	19,00	19,99	25	144	89	83	60	3,6	56	W28
3850952	TDM200R3SCF25M	20,00	20,99	25	149	93	87	63	3,8	56	W29
3992070	TDM210R3SCF25M	21,00	21,99	25	153	97	91	66	3,7	56	W30
3992071	TDM220R3SCF25M	22,00	22,99	25	158	102	96	69	3,9	56	W31
3992072	TDM230R3SCF25M	23,00	23,99	25	162	106	100	72	4,1	56	W32
3992483	TDM240R3SCF25M	24,00	24,99	25	166	110	104	75	4,2	56	W33
3992484	TDM250R3SCF25M	25,00	25,99	25	170	114	108	78	4,4	56	W34

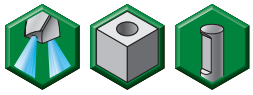
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

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TDM1 • 5 x D • Flanged Shank • Metric





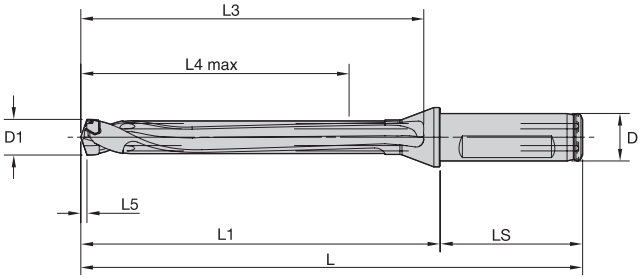


order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	SSC
3850905	TDM080R5SCF12M	7,94	8,49	12	104	59	53	43	1,5	45	W10
3850907	TDM085R5SCF12M	8,50	8,99	12	107	62	56	45	1,6	45	W11
3850909	TDM090R5SCF12M	9,00	9,49	12	110	65	59	48	1,7	45	W12
3850911	TDM095R5SCF12M	9,50	9,99	12	114	69	63	50	1,8	45	W13
3850923	TDM100R5SCF16M	10,00	10,49	16	120	72	66	53	1,9	48	W14
3850925	TDM105R5SCF16M	10,50	10,99	16	123	75	69	55	2,0	48	W15
3850927	TDM110R5SCF16M	11,00	11,49	16	126	78	72	58	2,1	48	W16
3850929	TDM115R5SCF16M	11,50	11,99	16	129	81	75	60	2,2	48	W17
3850931	TDM120R5SCF16M	12,00	12,49	16	132	84	78	63	2,3	48	W18
3850933	TDM125R5SCF16M	12,50	12,99	16	135	87	81	65	2,4	48	W19
3850935	TDM130R5SCF16M	13,00	13,49	16	138	90	84	68	2,5	48	W20
3850937	TDM135R5SCF16M	13,50	13,99	16	142	94	88	70	2,6	48	W21
3850939	TDM140R5SCF16M	14,00	14,49	16	145	97	91	73	2,7	48	W22
3850941	TDM145R5SCF16M	14,50	14,99	16	148	100	94	75	2,8	48	W23
3850943	TDM150R5SCF20M	15,00	15,99	20	156	106	100	80	2,8	50	W24
3850945	TDM160R5SCF20M	16,00	16,99	20	162	112	106	85	3,0	50	W25
3850947	TDM170R5SCF20M	17,00	17,99	20	169	119	113	90	3,2	50	W26
3850949	TDM180R5SCF25M	18,00	18,99	25	181	125	119	95	3,4	56	W27
3850951	TDM190R5SCF25M	19,00	19,99	25	187	131	125	100	3,6	56	W28
3850953	TDM200R5SCF25M	20,00	20,99	25	193	137	131	105	3,8	56	W29
3992485	TDM210R5SCF25M	21,00	21,99	25	200	144	138	110	3,7	56	W30
3992486	TDM220R5SCF25M	22,00	22,99	25	206	150	144	115	3,9	56	W31
3992487	TDM230R5SCF25M	23,00	23,99	25	212	156	150	120	4,1	56	W32
3992488	TDM240R5SCF25M	24,00	24,99	25	218	162	156	125	4,2	56	W33
3992489	TDM250R5SCF25M	25,00	25,99	25	225	169	163	130	4,4	56	W34

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

TDM1 • 8 x D • Flanged Shank • Metric



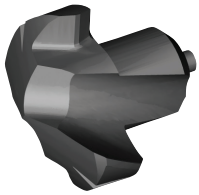


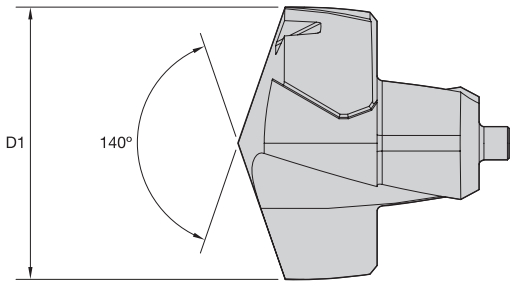
order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	SSC
3992141	TDM080R8SCF12M	7,94	8,49	12	129	84	79	68	1,4	45	W10
3992142	TDM085R8SCF12M	8,50	8,99	12	134	89	83	72	1,5	45	W11
3992213	TDM090R8SCF12M	9,00	9,49	12	138	93	88	76	1,6	45	W12
3992214	TDM095R8SCF12M	9,50	9,99	12	144	99	93	80	1,7	45	W13
3992215	TDM100R8SCF16M	10,00	10,49	16	151	103	98	84	1,8	48	W14
3992216	TDM105R8SCF16M	10,50	10,99	16	156	108	102	88	1,9	48	W15
3992217	TDM110R8SCF16M	11,00	11,49	16	160	112	107	92	2,0	48	W16
3992218	TDM115R8SCF16M	11,50	11,99	16	165	117	111	96	2,1	48	W17
3992219	TDM120R8SCF16M	12,00	12,49	16	169	121	116	100	2,1	48	W18
3992220	TDM125R8SCF16M	12,50	12,99	16	174	126	120	104	2,2	48	W19
3992221	TDM130R8SCF16M	13,00	13,49	16	178	130	125	108	2,3	48	W20
3992222	TDM135R8SCF16M	13,50	13,99	16	184	136	130	112	2,4	48	W21
3992223	TDM140R8SCF16M	14,00	14,49	16	188	140	135	116	2,5	48	W22
3992224	TDM145R8SCF16M	14,50	14,99	16	193	145	139	120	2,6	48	W23
3992225	TDM150R8SCF20M	15,00	15,99	20	204	154	148	128	2,7	50	W24
3992226	TDM160R8SCF20M	16,00	16,99	20	213	163	157	136	2,8	50	W25
3992227	TDM170R8SCF20M	17,00	17,99	20	223	173	167	144	3,0	50	W26
3992228	TDM180R8SCF25M	18,00	18,99	25	238	182	176	152	2,9	56	W27
3992229	TDM190R8SCF25M	19,00	19,99	25	247	191	185	160	3,4	56	W28
3992230	TDM200R8SCF25M	20,00	20,99	25	256	200	194	168	3,6	56	W29
3992231	TDM210R8SCF25M	21,00	21,99	25	266	210	204	176	3,7	56	W30
3992232	TDM220R8SCF25M	22,00	22,99	25	275	219	213	184	3,9	56	W31
3992233	TDM230R8SCF25M	23,00	23,99	25	284	228	222	192	4,1	56	W32
3992234	TDM240R8SCF25M	24,00	24,99	25	293	237	231	200	4,2	56	W33
3992235	TDM250R8SCF25M	25,00	25,99	25	303	247	241	208	4,4	56	W34

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TDM1 • Inserts • UP(M)





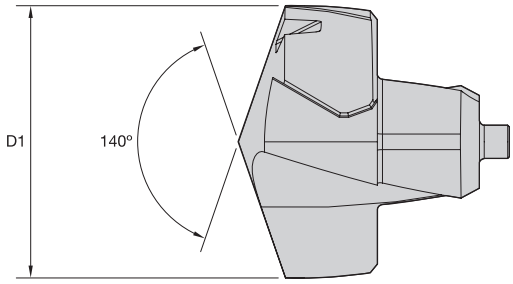
● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
H		

catalogue number	D1	SSC	WU25PD
TDM0800UPM	8,00	W10	3848984
TDM0850UPM	8,50	W11	3848988
TDM0900UPM	9,00	W12	3849043
TDM0950UPM	9,50	W13	3849048
TDM0960UPM	9,60	W13	3849049
TDM1000UPM	10,00	W14	3849051
TDM1010UPM	10,10	W14	3849052
TDM1020UPM	10,20	W14	3849053
TDM1030UPM	10,30	W14	3849054
TDM1040UPM	10,40	W14	3849055
TDM1050UPM	10,50	W15	3849056
TDM1060UPM	10,60	W15	3849057
TDM1080UPM	10,80	W15	3849059
TDM1100UPM	11,00	W16	3849061
TDM1120UPM	11,20	W16	3849063
TDM1130UPM	11,30	W16	3849064
TDM1140UPM	11,40	W16	3849065
TDM1150UPM	11,50	W17	3849066
TDM1170UPM	11,70	W17	3849068
TDM1180UPM	11,80	W17	3849069
TDM1200UPM	12,00	W18	3849071
TDM1210UPM	12,10	W18	3849072
TDM1220UPM	12,20	W18	3849073
TDM1230UPM	12,30	W18	3850986
TDM1250UPM	12,50	W19	3849075
TDM1260UPM	12,60	W19	3849076
TDM1270UPM	12,70	W19	3850988
TDM1280UPM	12,80	W19	3849077
TDM1300UPM	13,00	W20	3849078
TDM1310UPM	13,10	W20	3850990
TDM1320UPM	13,20	W20	3849079
TDM1330UPM	13,30	W20	3849080
TDM1350UPM	13,50	W21	3849082
TDM1380UPM	13,80	W21	3849085
TDM1400UPM	14,00	W22	3849086
TDM1410UPM	14,10	W22	3849087
TDM1420UPM	14,20	W22	3849088
TDM1430UPM	14,30	W22	3849089
TDM1440UPM	14,40	W22	3849090
TDM1450UPM	14,50	W23	3849091
TDM1460UPM	14,60	W23	3849092
TDM1480UPM	14,80	W23	3849094
TDM1500UPM	15,00	W24	3849096
TDM1510UPM	15,10	W24	3849097
TDM1520UPM	15,20	W24	3849098
TDM1530UPM	15,30	W24	3849099
TDM1540UPM	15,40	W24	3849100
TDM1550UPM	15,50	W24	3849101
TDM1560UPM	15,60	W24	3849102
TDM1570UPM	15,70	W24	3849103
TDM1580UPM	15,80	W24	3849104
TDM1600UPM	16,00	W25	3849105
TDM1650UPM	16,50	W25	3849110
TDM1660UPM	16,60	W25	3849111
TDM1670UPM	16,70	W25	3849112
TDM1700UPM	17,00	W26	3849119

TDM1 • Inserts • UP(M)

(continued)



● first choice
○ alternate choice

P		●
M		○
K		●
N		
S		
H		

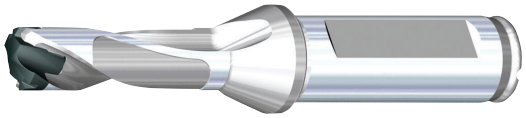
catalogue number	D1	SSC	WU25PD
TDM1720UPM	17,20	W26	3849121
TDM1740UPM	17,40	W26	3849193
TDM1750UPM	17,50	W26	3849194
TDM1770UPM	17,70	W26	3849196
TDM1800UPM	18,00	W27	3849199
TDM1850UPM	18,50	W27	3849204
TDM1890UPM	18,90	W27	3849208
TDM1900UPM	19,00	W28	3849209
TDM1920UPM	19,20	W28	3849211
TDM1950UPM	19,50	W28	3849214
TDM1980UPM	19,80	W28	3849217
TDM2000UPM	20,00	W29	3849219
TDM2010UPM	20,10	W29	3849220
TDM2020UPM	20,20	W29	3849221
TDM2024UPM	20,24	W29	3851017
TDM2030UPM	20,30	W29	3849222
TDM2040UPM	20,40	W29	3849223
TDM2050UPM	20,50	W29	3849224
TDM2070UPM	20,70	W29	3849226
TDM2080UPM	20,80	W29	3849227
TDM2090UPM	20,90	W29	3849228
TDM2099UPM	20,99	W29	3849229
TDM2100UPM	21,00	W30	4003225
TDM2144UPM	21,44	W30	4003203
TDM2150UPM	21,50	W30	3969291
TDM2200UPM	22,00	W31	4003226
TDM2223UPM	22,23	W31	4003204
TDM2245UPM	22,45	W31	4003205
TDM2250UPM	22,50	W31	4003227
TDM2300UPM	23,00	W32	4003228
TDM2350UPM	23,50	W32	4003229
TDM2381UPM	23,81	W32	4003206
TDM2400UPM	24,00	W33	4003230
TDM2450UPM	24,50	W33	4003231
TDM2461UPM	24,61	W33	4003207
TDM2500UPM	25,00	W34	4003232
TDM2540UPM	25,40	W34	4003208
TDM2550UPM	25,50	W34	4002444
TDM2568UPM	25,68	W34	4003209
TDM2581UPM	25,81	W34	4003210
TDM2599UPM	25,99	W34	3992013

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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Application Data • UP(M) • WU25PD • Metric





Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate							
		min	Starting Value	max	Tool Diameter (mm)	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P	1	90	**125**	170	mm/r	0,11–0,20	0,13–0,25	0,14–0,31	0,17–0,39	0,19–0,45	0,25–0,48	0,30–0,52
	2	105	**140**	180	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,21–0,46	0,23–0,46	0,28–0,50	0,30–0,52
	3	50	**75**	100	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,21–0,46	0,23–0,46	0,28–0,50	0,30–0,52
	4	50	**75**	100	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,17–0,36	0,19–0,45	0,22–0,48	0,25–0,50
	5	50	**65**	80	mm/r	0,10–0,20	0,10–0,23	0,10–0,25	0,14–0,29	0,16–0,32	0,18–0,36	0,22–0,42
	6	50	**65**	80	mm/r	0,10–0,20	0,10–0,23	0,10–0,25	0,14–0,29	0,16–0,32	0,18–0,36	0,22–0,42
M	1	40	**80**	110	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
	2	35	**55**	75	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
	3	20	**35**	50	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
K	1	60	**95**	170	mm/r	0,15–0,29	0,16–0,32	0,17–0,35	0,21–0,42	0,25–0,48	0,28–0,52	0,32–0,56
	2	60	**75**	90	mm/r	0,15–0,29	0,16–0,30	0,17–0,33	0,21–0,41	0,25–0,48	0,28–0,52	0,32–0,56
	3	40	**65**	90	mm/r	0,16–0,30	0,17–0,33	0,18–0,36	0,20–0,41	0,21–0,44	0,23–0,48	0,25–0,50

NOTE: Through coolant recommended for greater than 3 x D applications.

ONE SOURCE, MANY APPLICATIONS

WIDIA™ APPROVED TAP/DRILL COMBINATIONS:

VariDrill™/VariTap™

P M K N S



Versatile:

VariDrill™ drilling tools, in combination with VariTap™ tapping tools, are designed for productivity in an array of different materials. These tools feature strong geometries that are ideal for small-batch and varied production.

TOP DRILL S™/GT Series

P
TDS401
TDS402
TDS403
GT00, 20, 24 Spiral Point
GT30, 32, 50 Spiral Flute
GT23, 24, 25 Forming



M
TDS451
TDS452
TDS453
GT20
GT30



K
TDS411
TDS412
TDS413
GT40
GT41



N
TDS421
TDS422
GT70
GT80
GT22
GT40



S
TDS451
TDS452
TDS453
GT60
GT90
GT62
GT92



Optimised:

TOP DRILL S™ drills, combined with GT Series Taps:

This combination is designed for, but not limited to, material-specific applications with medium to large batch production.

For more than 90 years, WIDIA has defined excellence in innovation, technology, and customer service. As an industry-leading manufacturer of cutting tools, WIDIA offers a complete portfolio of precision-engineered products. With drilling, tapping and tooling systems products, you will find everything you need from one single source.

- Extensive Portfolio
- Expertise
- Customised Solutions

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INDEXABLE DRILLS

Top Cut 4™

Pages C60–C74

The next generation of indexable drilling.

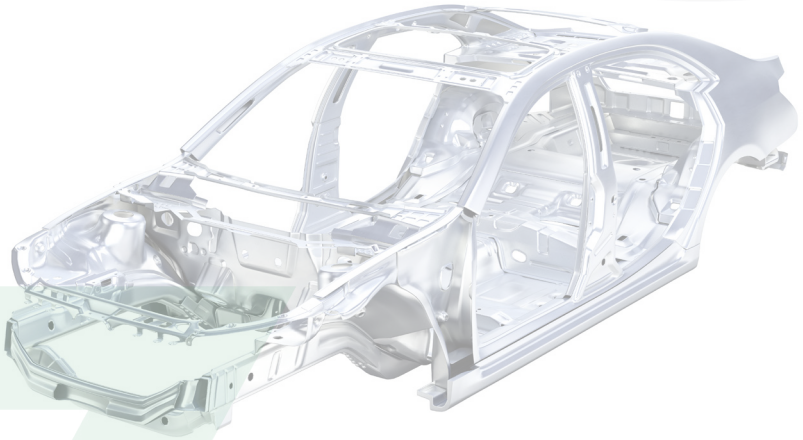


ALL-STAR

GENERAL ENGINEERING

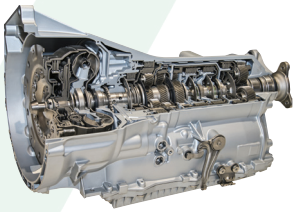


TRANSPORTATION





Flange



Transmission



Connecting Rod



GENERAL ENGINEERING

TRANSPORTATION

WIDIA™ manufactures tools to meet application needs in steel, cast iron, and aluminium automotive components.

TO SEE ALL PRODUCT LINES, VISIT OUR DIGITAL RESOURCES

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To learn more, visit widia.com

Top Cut 4™

WIDIA™ Top Cut 4 (TC4) portfolio is a broad offering for customers looking for a versatile indexable drilling platform.

- Easy to apply, highly versatile.
- No risk of mixing up inner and outer insert due to clear visual differences.
- Easy-to-change inserts, laser marked with geometries and grades.
- Easy-to-use nomenclature guide enabling the tool body and the related insert selection to avoid order failures.
- Breadth of application capabilities include through and cross holes, inclined entry and exit opportunity, 45° corner, half cylindrical, concave, or chain drilling.
- Four grades to achieve higher tool life at accelerated speeds:

— WU25CH grade for highest metal removal rate in general applications.

— WU40PH grade for high toughness demands.

— WPK10CH grade for high-speed applications.

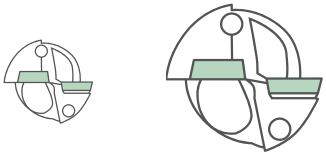
— WN10PH grade specific for aluminium and other non-ferrous materials.

L/D Ratios

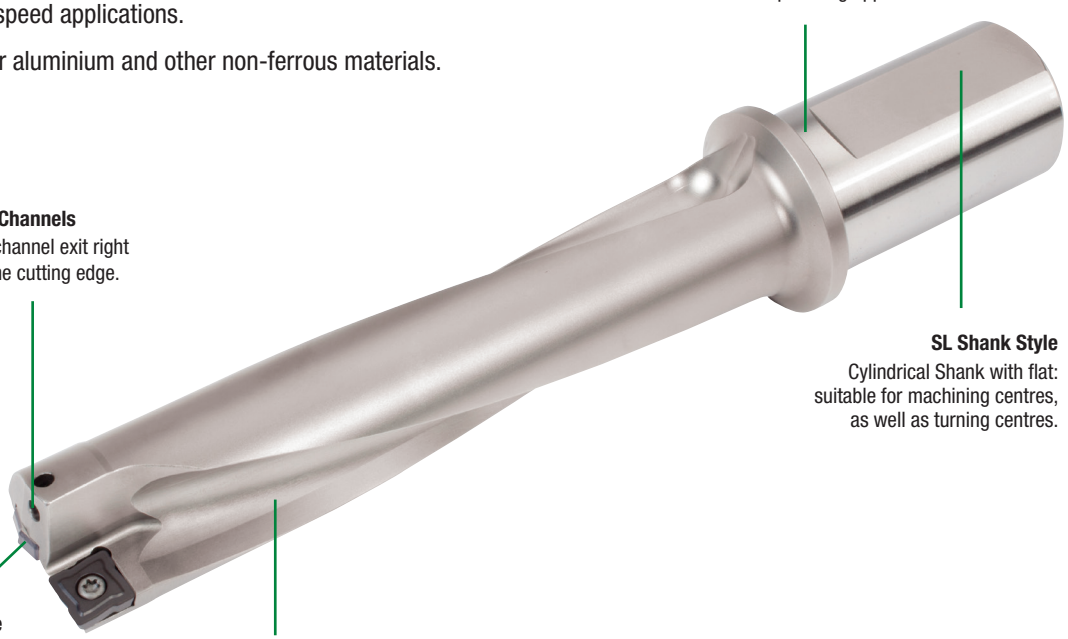


Standard diameter range covering

12–68mm



Flanged Shank
Increase the overall drill stability, above all in deep-drilling applications.



Coolant Channels
Coolant channel exit right behind the cutting edge.

SL Shank Style
Cylindrical Shank with flat: suitable for machining centres, as well as turning centres.

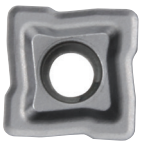
Differentiated Inserts Shape
To avoid grade mixing between central and periphery inserts.

Optimised Chip Flute
Large and optimised flutes to contain chips during machining.

Top Cut 4 Inserts Expansion — Long Chip Materials — Non-Ferrous Materials.

- Four real cutting edges on each insert for entire platform.
- Eight insert sizes to cover complete diameter range.

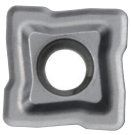
-V34



P K

First choice for machining Steel, Cast Iron, and short chipping materials. Suitable for severe cutting conditions.

-V36



P M K

First choice for Stainless Steel. Suitable for deep drilling and where low power consumption is required.

-V36 WN10PH



N

First choice for Non-Ferrous materials.

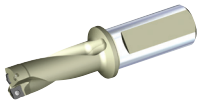
-V38

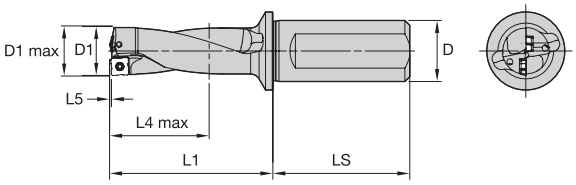


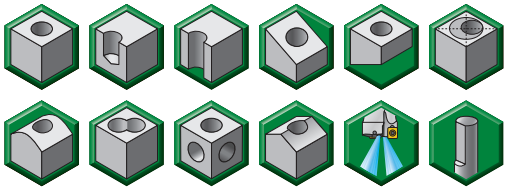
P M S

Ideal for long chipping materials.

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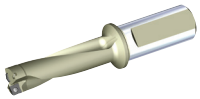
order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	centre insert
5537778	TCF120R2SLR20MA	12,00	12,50	20	43,4	24,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537861	TCF130R2SLR20MA	13,00	13,50	20	46,5	26,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5577828	TCF140R2SLR25MB	14,00	14,50	25	48,5	28,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577920	TCF150R2SLR25MB	15,00	15,50	25	51,5	30,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577922	TCF160R2SLR25MB	16,00	16,50	25	54,6	32,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577923	TCF165R2SLR25MB	16,50	17,00	25	56,6	33,6	0,60	56,00	B	TCF050204BP	TCF060203BC
5577924	TCF170R2SLR25MB	17,00	17,50	25	57,6	34,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577925	TCF175R2SLR25MB	17,50	18,00	25	59,6	35,6	0,63	56,00	B	TCF050204BP	TCF060203BC
5577926	TCF180R2SLR25MB	18,00	18,50	25	60,6	36,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577927	TCF185R2SLR25MB	18,50	19,00	25	62,7	37,7	0,65	56,00	B	TCF050204BP	TCF060203BC
5578820	TCF190R2SLR25MC	19,00	19,50	25	63,7	38,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578821	TCF195R2SLR25MC	19,50	20,00	25	65,7	39,7	0,71	56,00	C	TCF070306CP	TCF070304CC
5578822	TCF200R2SLR25MC	20,00	20,50	25	66,7	40,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578824	TCF210R2SLR25MC	21,00	21,50	25	70,8	42,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578825	TCF220R2SLR25MC	22,00	22,50	25	73,8	44,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578827	TCF230R2SLR25MC	23,00	23,50	25	76,8	46,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537167	TCF240R2SLR25MD	24,00	25,00	25	76,9	48,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537168	TCF250R2SLR32MD	25,00	26,00	32	80,9	50,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537169	TCF260R2SLR32MD	26,00	27,00	32	83,9	52,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537821	TCF270R2SLR32MD	27,00	28,00	32	87,0	55,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537822	TCF280R2SLR32MD	28,00	29,00	32	90,0	57,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537823	TCF290R2SLR32MD	29,00	30,00	32	93,0	59,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537937	TCF300R2SLR32ME	30,00	31,00	32	93,1	61,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537938	TCF310R2SLR32ME	31,00	32,00	32	96,1	63,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537939	TCF320R2SLR32ME	32,00	33,00	32	99,2	65,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537940	TCF330R2SLR40ME	33,00	34,00	40	103,2	67,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537941	TCF340R2SLR40ME	34,00	35,00	40	106,2	69,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537942	TCF350R2SLR40ME	35,00	36,00	40	109,2	71,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537943	TCF360R2SLR40ME	36,00	37,00	40	112,3	73,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578602	TCF390R2SLR40MF	39,00	40,00	40	121,4	79,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578603	TCF400R2SLR40MF	40,00	41,00	40	123,4	81,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578607	TCF440R2SLR40MF	44,00	45,00	40	135,6	89,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578608	TCF450R2SLR40MF	45,00	46,00	40	138,6	91,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578698	TCF500R2SLR40MG	50,00	51,00	40	147,8	101,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578714	TCF550R2SLR40MG	55,00	56,00	40	161,9	111,9	1,92	70,00	G	TCF150512GP	TCF180508GC

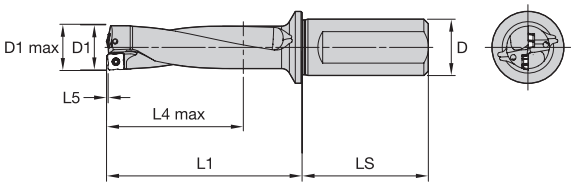
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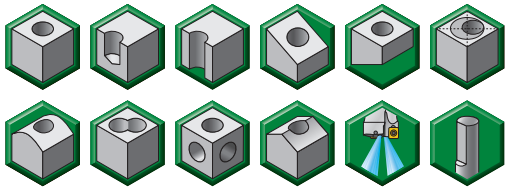
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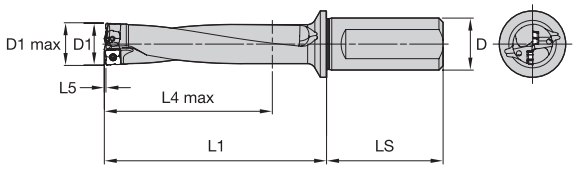
order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	centre insert
5537863	TCF120R3SLR20MA	12,00	12,50	20	55,4	36,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537867	TCF130R3SLR20MA	13,00	13,50	20	59,5	39,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5577928	TCF140R3SLR25MB	14,00	14,50	25	62,5	42,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577929	TCF145R3SLR25MB	14,50	15,00	25	64,0	44,0	0,52	56,00	B	TCF050204BP	TCF060203BC
5577930	TCF150R3SLR25MB	15,00	15,50	25	66,5	45,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577932	TCF160R3SLR25MB	16,00	16,50	25	70,6	48,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577933	TCF165R3SLR25MB	16,50	17,00	25	73,1	50,1	0,60	56,00	B	TCF050204BP	TCF060203BC
5577934	TCF170R3SLR25MB	17,00	17,50	25	74,6	51,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577935	TCF175R3SLR25MB	17,50	18,00	25	77,1	53,1	0,63	56,00	B	TCF050204BP	TCF060203BC
5577936	TCF180R3SLR25MB	18,00	18,50	25	78,6	54,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577937	TCF185R3SLR25MB	18,50	19,00	25	81,2	56,2	0,65	56,00	B	TCF050204BP	TCF060203BC
5578828	TCF190R3SLR25MC	19,00	19,50	25	82,7	57,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578829	TCF195R3SLR25MC	19,50	20,00	25	85,2	59,2	0,71	56,00	C	TCF070306CP	TCF070304CC
5578830	TCF200R3SLR25MC	20,00	20,50	25	86,7	60,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578832	TCF210R3SLR25MC	21,00	21,50	25	91,8	63,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578833	TCF220R3SLR25MC	22,00	22,50	25	95,8	66,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578835	TCF230R3SLR25MC	23,00	23,50	25	99,8	69,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537824	TCF240R3SLR25MD	24,00	25,00	25	100,9	72,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537825	TCF250R3SLR32MD	25,00	26,00	32	105,9	75,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537826	TCF260R3SLR32MD	26,00	27,00	32	109,9	78,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537828	TCF270R3SLR32MD	27,00	28,00	32	114,0	82,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537829	TCF280R3SLR32MD	28,00	29,00	32	118,0	85,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537830	TCF290R3SLR32MD	29,00	30,00	32	122,0	88,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537944	TCF300R3SLR32ME	30,00	31,00	32	123,1	91,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537945	TCF310R3SLR32ME	31,00	32,00	32	127,1	94,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537946	TCF320R3SLR32ME	32,00	33,00	32	131,2	97,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537947	TCF330R3SLR40ME	33,00	34,00	40	136,2	100,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537948	TCF340R3SLR40ME	34,00	35,00	40	140,2	103,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537949	TCF350R3SLR40ME	35,00	36,00	40	144,2	106,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537950	TCF360R3SLR40ME	36,00	37,00	40	148,3	109,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578611	TCF380R3SLR40MF	38,00	39,00	40	156,4	115,4	1,38	70,00	F	TCF120412FP	TCF150406FC
5578612	TCF390R3SLR40MF	39,00	40,00	40	160,4	118,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578613	TCF400R3SLR40MF	40,00	41,00	40	163,4	121,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578617	TCF440R3SLR40MF	44,00	45,00	40	179,6	133,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578618	TCF450R3SLR40MF	45,00	46,00	40	183,6	136,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578720	TCF500R3SLR40MG	50,00	51,00	40	197,8	151,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578727	TCF550R3SLR40MG	55,00	56,00	40	216,9	166,9	1,92	70,00	G	TCF150512GP	TCF180508GC
5538646	TCF680R3SLR40MH	68,00	69,00	40	260,4	206,4	2,36	70,00	H	TCF180614HP	TCF210608HC

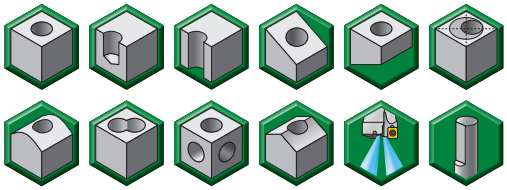
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order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	LS	SSC	periphery insert	centre insert
5537869	TCF120R4SLR20MA	12,00	12,50	20	67,4	48,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537872	TCF130R4SLR20MA	13,00	13,50	20	72,5	52,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5577938	TCF140R4SLR25MB	14,00	14,50	25	76,5	56,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577940	TCF150R4SLR25MB	15,00	15,50	25	81,5	60,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577942	TCF160R4SLR25MB	16,00	16,50	25	86,6	64,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577943	TCF165R4SLR25MB	16,50	17,00	25	89,6	66,6	0,60	56,00	B	TCF050204BP	TCF060203BC
5577944	TCF170R4SLR25MB	17,00	17,50	25	91,6	68,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577945	TCF175R4SLR25MB	17,50	18,00	25	94,6	70,6	0,63	56,00	B	TCF050204BP	TCF060203BC
5577946	TCF180R4SLR25MB	18,00	18,50	25	96,6	72,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577947	TCF185R4SLR25MB	18,50	19,00	25	99,7	74,7	0,65	56,00	B	TCF050204BP	TCF060203BC
5578836	TCF190R4SLR25MC	19,00	19,50	25	101,7	76,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578837	TCF195R4SLR25MC	19,50	20,00	25	104,7	78,7	0,71	56,00	C	TCF070306CP	TCF070304CC
5578838	TCF200R4SLR25MC	20,00	20,50	25	106,7	80,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578840	TCF210R4SLR25MC	21,00	21,50	25	112,8	84,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578841	TCF220R4SLR25MC	22,00	22,50	25	117,8	88,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578843	TCF230R4SLR25MC	23,00	23,50	25	122,8	92,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537831	TCF240R4SLR25MD	24,00	25,00	25	124,9	96,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537832	TCF250R4SLR32MD	25,00	26,00	32	130,9	100,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537833	TCF260R4SLR32MD	26,00	27,00	32	135,9	104,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537835	TCF270R4SLR32MD	27,00	28,00	32	141,0	109,0	0,97	60,00	D	TCF080308DP	TCF090305DC
5537836	TCF280R4SLR32MD	28,00	29,00	32	146,0	113,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537837	TCF290R4SLR32MD	29,00	30,00	32	151,0	117,0	1,02	60,00	D	TCF080308DP	TCF090305DC
5537951	TCF300R4SLR32ME	30,00	31,00	32	153,1	121,1	1,09	60,00	E	TCF100408EP	TCF120405EC
5537952	TCF310R4SLR32ME	31,00	32,00	32	158,1	125,1	1,12	60,00	E	TCF100408EP	TCF120405EC
5537953	TCF320R4SLR32ME	32,00	33,00	32	163,2	129,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537954	TCF330R4SLR40ME	33,00	34,00	40	165,2	133,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537955	TCF340R4SLR40ME	34,00	35,00	40	174,2	137,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537956	TCF350R4SLR40ME	35,00	36,00	40	179,2	141,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537957	TCF360R4SLR40ME	36,00	37,00	40	184,3	145,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578622	TCF390R4SLR40MF	39,00	40,00	40	199,4	157,4	1,41	70,00	F	TCF120412FP	TCF150406FC
5578623	TCF400R4SLR40MF	40,00	41,00	40	203,4	161,4	1,45	70,00	F	TCF120412FP	TCF150406FC
5578627	TCF440R4SLR40MF	44,00	45,00	40	223,6	177,6	1,56	70,00	F	TCF120412FP	TCF150406FC
5578628	TCF450R4SLR40MF	45,00	46,00	40	228,6	181,6	1,59	70,00	F	TCF120412FP	TCF150406FC
5578733	TCF500R4SLR40MG	50,00	51,00	40	247,8	201,8	1,79	70,00	G	TCF150512GP	TCF180508GC
5578739	TCF550R4SLR40MG	55,00	56,00	40	271,9	221,9	1,92	70,00	G	TCF150512GP	TCF180508GC

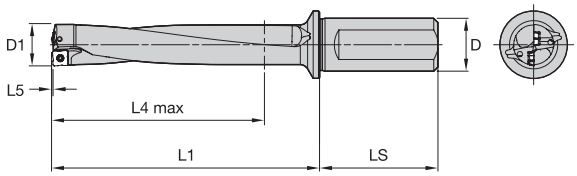
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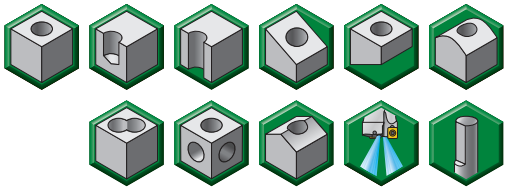
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TC4 • 5 x D • SLR Shanks • Metric





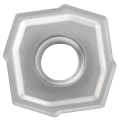


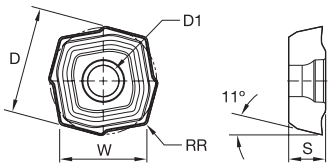
order number	catalogue number	D1	D	L1	L4 max	L5	LS	SSC	periphery insert	centre insert
5537874	TCF120R5SLR20MA	12,00	20	79,4	60,4	0,43	50,00	A	TCF040204AP	TCF040203AC
5537877	TCF130R5SLR20MA	13,00	20	85,5	65,5	0,47	50,00	A	TCF040204AP	TCF040203AC
5577948	TCF140R5SLR25MB	14,00	25	90,5	70,5	0,49	56,00	B	TCF050204BP	TCF060203BC
5577950	TCF150R5SLR25MB	15,00	25	96,5	75,5	0,55	56,00	B	TCF050204BP	TCF060203BC
5577952	TCF160R5SLR25MB	16,00	25	102,6	80,6	0,58	56,00	B	TCF050204BP	TCF060203BC
5577953	TCF165R5SLR25MB	16,50	25	106,1	83,1	0,60	56,00	B	TCF050204BP	TCF060203BC
5577954	TCF170R5SLR25MB	17,00	25	108,6	85,6	0,61	56,00	B	TCF050204BP	TCF060203BC
5577955	TCF175R5SLR25MB	17,50	25	112,1	88,1	0,63	56,00	B	TCF050204BP	TCF060203BC
5577956	TCF180R5SLR25MB	18,00	25	114,6	90,6	0,64	56,00	B	TCF050204BP	TCF060203BC
5577957	TCF185R5SLR25MB	18,50	25	118,2	93,2	0,65	56,00	B	TCF050204BP	TCF060203BC
5578844	TCF190R5SLR25MC	19,00	25	120,7	95,7	0,68	56,00	C	TCF070306CP	TCF070304CC
5578845	TCF195R5SLR25MC	19,50	25	124,2	98,2	0,71	56,00	C	TCF070306CP	TCF070304CC
5578846	TCF200R5SLR25MC	20,00	25	126,7	100,7	0,72	56,00	C	TCF070306CP	TCF070304CC
5578848	TCF210R5SLR25MC	21,00	25	133,8	105,8	0,75	56,00	C	TCF070306CP	TCF070304CC
5578849	TCF220R5SLR25MC	22,00	25	139,8	110,8	0,78	56,00	C	TCF070306CP	TCF070304CC
5578851	TCF230R5SLR25MC	23,00	25	145,8	115,8	0,80	56,00	C	TCF070306CP	TCF070304CC
5537838	TCF240R5SLR25MD	24,00	25	148,9	120,9	0,87	56,00	D	TCF080308DP	TCF090305DC
5537839	TCF250R5SLR32MD	25,00	32	155,9	125,9	0,91	60,00	D	TCF080308DP	TCF090305DC
5537840	TCF260R5SLR32MD	26,00	32	161,9	130,9	0,94	60,00	D	TCF080308DP	TCF090305DC
5537843	TCF280R5SLR32MD	28,00	32	174,0	141,0	0,99	60,00	D	TCF080308DP	TCF090305DC
5537960	TCF320R5SLR32ME	32,00	32	195,2	161,2	1,15	60,00	E	TCF100408EP	TCF120405EC
5537961	TCF330R5SLR40ME	33,00	40	202,2	166,2	1,18	70,00	E	TCF100408EP	TCF120405EC
5537962	TCF340R5SLR40ME	34,00	40	208,2	171,2	1,21	70,00	E	TCF100408EP	TCF120405EC
5537963	TCF350R5SLR40ME	35,00	40	214,2	176,2	1,24	70,00	E	TCF100408EP	TCF120405EC
5537964	TCF360R5SLR40ME	36,00	40	220,3	181,3	1,27	70,00	E	TCF100408EP	TCF120405EC
5578643	TCF400R5SLR40MF	40,00	40	243,4	201,4	1,45	70,00	F	TCF120412FP	TCF150406FC

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the inserts.

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece.
When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force.
Provide adequate shielding to protect bystanders.

TC4 • Centre Inserts • Aluminium • V36





● first choice
○ alternate choice

	P	M	K	N	S	H
WN10PH				●		

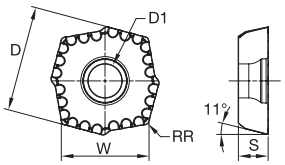
catalogue number	D	D1	W	S	RR	SSC	
TCF070304CCV36	7,59	2,60	6,20	2,80	0,400	C	6372042
TCF090305DCV36	9,55	2,80	7,80	3,00	0,500	D	6372045
TCF120405ECV36	12,00	3,40	9,80	3,60	0,500	E	6372047
TCF150406FCV36	14,94	4,80	12,20	4,20	0,600	F	6346757
TCF210608HCV36	21,68	7,50	17,70	6,50	0,800	H	6372049

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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TC4 • Centre Inserts • Long Chip Materials • V38





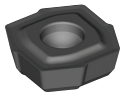
● first choice
○ alternate choice

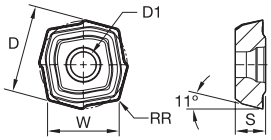
P		●					
M		●					
K		●					
N							
S							
H							

catalogue number	D	D1	W	S	RR	SSC	WU40PH
TCF040203ACV38	4,47	2,10	3,65	2,00	0,300	A	6429458
TCF060203BCV38	6,00	2,40	4,90	2,40	0,300	B	6429459
TCF070304CCV38	7,59	2,60	6,20	2,80	0,400	C	6429460
TCF090305DCV38	9,55	2,80	7,80	3,00	0,500	D	6429461
TCF120405ECV38	12,00	3,40	9,80	3,60	0,500	E	6429462
TCF150406FCV38	14,94	4,80	12,20	4,20	0,600	F	6429463
TCF180508GCV38	17,88	6,00	14,60	5,40	0,800	G	6324383
TCF210608HCV38	21,68	7,50	17,70	6,50	0,800	H	6429464

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

TC4 • Centre Inserts • V34





● first choice
○ alternate choice

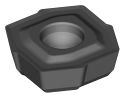
P	○	●
M	○	●
K	○	●
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S		
H		

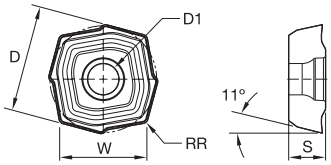
catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040203ACV34	4,47	2,10	3,65	2,00	0,300	A	5541817	5541818
TCF060203BCV34	6,00	2,40	4,90	2,40	0,300	B	5542602	5542604
TCF070304CCV34	7,59	2,60	6,20	2,80	0,400	C	5542642	5542643
TCF090305DCV34	9,55	2,80	7,80	3,00	0,500	D	5538554	5538555
TCF120405ECV34	12,00	3,40	9,80	3,60	0,500	E	5538603	5538604
TCF150406FCV34	14,94	4,80	12,20	4,20	0,600	F	5542623	5542624
TCF180508GCV34	17,88	6,00	14,60	5,40	0,800	G	5542475	5542476
TCF210608HCV34	21,68	7,50	17,70	6,50	0,800	H	5542002	5542003

NOTE: For application-specific insert selection, please refer to the application data on page C73.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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TC4 • Centre Inserts • V36





● first choice
○ alternate choice

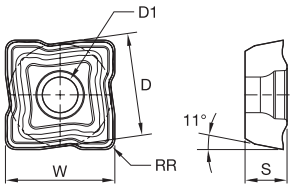
P		○	●
M		○	●
K		○	●
N			
S			
H			

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040203ACV36	4,47	2,10	3,65	2,00	0,300	A	5541819	5541840
TCF060203BCV36	6,00	2,40	4,90	2,40	0,300	B	5542606	5542607
TCF070304CCV36	7,59	2,60	6,20	2,80	0,400	C	5542644	5542645
TCF090305DCV36	9,55	2,80	7,80	3,00	0,500	D	5538556	5538557
TCF120405ECV36	12,00	3,40	9,80	3,60	0,500	E	5538606	5538607
TCF150406FCV36	14,94	4,80	12,20	4,20	0,600	F	5542625	5542626
TCF180508GCV36	17,88	6,00	14,60	5,40	0,800	G	5542477	5542478
TCF210608HCV36	21,68	7,50	17,70	6,50	0,800	H	5542004	5542005

NOTE: For application-specific insert selection, please refer to the application data on page C73.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

TC4 • Periphery Inserts • Aluminium • V36





● first choice
○ alternate choice

P		
M		
K		
N		●
S		
H		

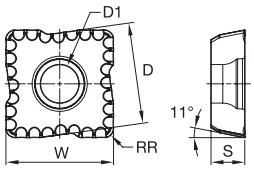
catalogue number	D	D1	W	S	RR	SSC	WN10PH
TCF070306CPV36	6,67	2,60	7,10	2,80	0,600	C	6372043
TCF080308DPV36	8,08	2,80	8,60	3,00	0,800	D	6372044
TCF100408EPV36	9,96	3,40	10,60	3,60	0,800	E	6372046
TCF120412FPV36	12,59	4,80	13,40	4,20	1,200	F	6348893

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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TC4 • Periphery Inserts • Long Chip Materials • V38





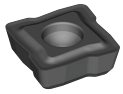
● first choice
○ alternate choice

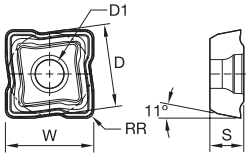
P		○	●
M		○	●
K		○	●
N			
S			
H			

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040204APV38	4,14	2,10	4,40	2,00	0,400	A	-	6429425
TCF050204BPV38	5,07	2,40	5,40	2,40	0,400	B	6429426	6429427
TCF070306CPV38	6,67	2,60	7,10	2,80	0,600	C	6429466	6429428
TCF080308DPV38	8,08	2,80	8,60	3,00	0,800	D	6429429	6429430
TCF100408EPV38	9,96	3,40	10,60	3,60	0,800	E	6429451	6429452
TCF120412FPV38	12,59	4,80	13,40	4,20	1,200	F	6429453	6429454
TCF150512GPV38	15,13	6,00	16,10	5,40	1,200	G	6429455	6324381
TCF180614HPV38	18,04	7,50	19,20	6,50	1,400	H	6429456	6429457

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

TC4 • Periphery Inserts • V34





● first choice
○ alternate choice

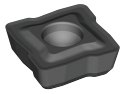
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M		○	○
K	○	●	○
N			
S			
H			

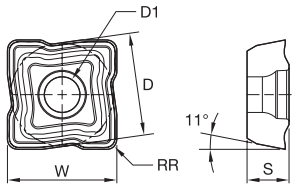
catalogue number	D	D1	W	S	RR	SSC	WPK10CH	WU25CH	WU40PH
TCF040204APV34	4,14	2,10	4,40	2,00	0,400	A	5541843	5541841	5541842
TCF050204BPV34	5,07	2,40	5,40	2,40	0,400	B	5542620	5542608	5542609
TCF070306CPV34	6,67	2,60	7,10	2,80	0,600	C	5542648	5542646	5542647
TCF080308DPV34	8,08	2,80	8,60	3,00	0,800	D	5538600	5538558	5538559
TCF100408EPV34	9,96	3,40	10,60	3,60	0,800	E	5538610	5538608	5538609
TCF120412FPV34	12,59	4,80	13,40	4,20	1,200	F	5542629	5542627	5542628
TCF150512GPV34	15,13	6,00	16,10	5,40	1,200	G	5542601	5542479	5542600
TCF180614HPV34	18,04	7,50	19,20	6,50	1,400	H	5542008	5542006	5542007

NOTE: For application-specific insert selection, please refer to the application data on page C73.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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TC4 • Periphery Inserts • V36





● first choice
○ alternate choice

	P	M	K	N	S	H
WU25CH	○	○	○			
WU40PH	●	●	●			

catalogue number	D	D1	W	S	RR	SSC	WU25CH	WU40PH
TCF040204APV36	4,14	2,10	4,40	2,00	0,400	A	5541844	5541845
TCF050204BPV36	5,07	2,40	5,40	2,40	0,400	B	5542621	5542622
TCF070306CPV36	6,67	2,60	7,10	2,80	0,600	C	5542649	5542650
TCF080308DPV36	8,08	2,80	8,60	3,00	0,800	D	5538601	5538602
TCF100408EPV36	9,96	3,40	10,60	3,60	0,800	E	5538611	5538612
TCF120412FPV36	12,59	4,80	13,40	4,20	1,200	F	5542640	5542641
TCF150512GPV36	15,13	6,00	16,10	5,40	1,200	G	5542603	5542605
TCF180614HPV36	18,04	7,50	19,20	6,50	1,400	H	5542009	5542020

NOTE: For application-specific insert selection, please refer to the application data on page C73.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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TC4 • Insert Selection Guide

Material Group	Geometry	Stable Cutting Conditions		Unstable Cutting Conditions		Interrupted Cutting Conditions	
		periphery insert	centre insert	periphery insert	centre insert	periphery insert	centre insert
P1	V38	WU25CH	WU40PH	**WU40PH**	**WU40PH**	WU40PH	WU40PH
P2–P4	V34	WPK10CH	WU40PH	**WU25CH**	**WU40PH**	WU40PH	WU40PH
P5–P6	V36	WU25CH	WU40PH	**WU40PH**	**WU40PH**	WU40PH	WU40PH
M1–M3	V36	WU25CH	WU40PH	**WU40PH**	**WU40PH**	WU40PH	WU40PH
K1–K3	V34	WPK10CH	WU40PH	**WU40PH**	**WU40PH**	WU40PH	WU40PH
N1–N4	V36	WN10PH	WN10PH	**WN10PH**	**WN10PH**	WN10PH	WN10PH
S1–S4	V38	WU40PH	WU40PH	**WU40PH**	**WU40PH**	WU40PH	WU40PH

NOTE: All speed conditions are for stable conditions. For unstable conditions, it is suggested to reduce starting speeds by 10%. For interrupted cuts, reduce by 20%.
For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above data.
For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above data.
For 5 x D, diameter range 25–68mm (inserts sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above data.
For 4 x D and 5 x D, it is recommended to reduce feed rate during entry and exit by 30–50%.

TC4 • Cutting Data • Metric

Material Group	Geometry	Grade		Cutting Speed – vc m/min			Recommended Feed Rate per Revolution				
		centre	periphery	min	Start	max	Tool Diameter	12,00–13,99 Insert Size A	14,00–18,99 Insert Size B	19,00–23,99 Insert Size C	24,00–29,99 Insert Size D
P0	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,06–0,08	0,08–0,11	0,10–0,13	0,11–0,14
P1	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,06–0,10	0,08–0,13	0,10–0,15	0,11–0,16
P2	–V34	WU40PH	WU25CH	120	**190**	280	mm/rev	0,06–0,10	0,08–0,15	0,10–0,16	0,11–0,17
P3	–V34	WU40PH	WPK10CH	120	**200**	310	mm/rev	0,08–0,15	0,10–0,16	0,11–0,18	0,12–0,20
P4	–V34	WU40PH	WPK10CH	120	**190**	310	mm/rev	0,08–0,15	0,10–0,16	0,11–0,18	0,12–0,20
P5	–V36	WU40PH	WU25CH	120	**180**	250	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
P6	-V36	WU40PH	WU25CH	120	**160**	210	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
M1	-V38	WU40PH	WU40PH	120	**160**	240	mm/rev	0,06–0,11	0,07–0,11	0,08–0,12	0,10–0,14
M2	–V38	WU40PH	WU40PH	110	**140**	210	mm/rev	0,06–0,10	0,07–0,11	0,08–0,12	0,10–0,14
M3	-V36	WU40PH	WU40PH	100	**120**	200	mm/rev	0,06–0,10	0,07–0,11	0,08–0,12	0,10–0,14
K1	-V34	WU25CH	WPK10CH	120	**200**	280	mm/rev	0,08–0,14	0,08–0,16	0,10–0,18	0,12–0,24
K2	–V34	WU40PH	WPK10CH	100	**180**	260	mm/rev	0,08–0,14	0,08–0,16	0,10–0,18	0,12–0,24
K3	-V34	WU40PH	WPK10CH	100	**170**	240	mm/rev	0,08–0,14	0,08–0,16	0,10–0,18	0,12–0,24
N1	-V36	WN10PH	WN10PH	250	**350**	500	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
N2	–V36	WN10PH	WN10PH	150	**300**	450	mm/rev	0,06–0,10	0,08–0,14	0,10–0,15	0,11–0,16
N3	-V36	WN10PH	WN10PH	80	**120**	150	mm/rev	0,06–0,10	0,07–0,11	0,08–0,12	0,10–0,14
S3	-V38	WU40PH	WU40PH	20	**30**	45	mm/rev	0,08–0,12	0,08–0,13	0,10–0,15	0,12–0,19
S4	–V38	WU40PH	WU40PH	35	**40**	65	mm/rev	0,08–0,12	0,08–0,13	0,10 –0,15	0,12–0,19

Material Group	Geometry	Grade		Cutting Speed – vc m/min			Tool Diameter	30,00–36,99 Insert Size E	37,00–45,99 Insert Size F	46,00–56,99 Insert Size G	57,00–68,00 Insert Size H
		centre	periphery	min	Start	max					
P0	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,13–0,16	0,15–0,18	0,16–0,23	0,17–0,24
P1	–V38	WU40PH	WU25CH	120	**180**	260	mm/rev	0,13–0,17	0,15–0,19	0,16–0,24	0,17–0,25
P2	–V34	WU40PH	WU25CH	120	**190**	280	mm/rev	0,13–0,20	0,15–0,21	0,16–0,28	0,17–0,30
P3	–V34	WU40PH	WPK10CH	120	**200**	310	mm/rev	0,16–0,24	0,16–0,24	0,18–0,30	0,19–0,32
P4	–V34	WU40PH	WPK10CH	120	**190**	310	mm/rev	0,14–0,22	0,16–0,24	0,18–0,30	0,19–0,32
P5	–V36	WU40PH	WU25CH	120	**180**	250	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,30
P6	-V36	WU40PH	WU25CH	120	**160**	210	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,29
M1	-V38	WU40PH	WU40PH	120	**160**	240	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
M2	–V38	WU40PH	WU40PH	110	**140**	210	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
M3	-V36	WU40PH	WU40PH	100	**120**	200	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
K1	-V34	WU25CH	WPK10CH	120	**200**	280	mm/rev	0,14–0,26	0,16–0,30	0,18–0,32	0,20–0,36
K2	–V34	WU40PH	WPK10CH	100	**180**	260	mm/rev	0,14–0,26	0,16–0,30	0,18–0,32	0,20–0,36
K3	-V34	WU40PH	WPK10CH	100	**170**	240	mm/rev	0,14–0,26	0,16–0,30	0,18–0,32	0,20–0,36
N1	-V36	WN10PH	WN10PH	250	**350**	500	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,30
N2	–V36	WN10PH	WN10PH	150	**300**	450	mm/rev	0,13–0,18	0,15–0,20	0,16–0,28	0,17–0,30
N3	-V36	WN10PH	WN10PH	80	**120**	150	mm/rev	0,12–0,17	0,14–0,21	0,16–0,23	0,16–0,24
S3	-V38	WU40PH	WU40PH	20	**30**	45	mm/rev	0,14–0,21	0,16–0,24	0,18–0,26	0,20–0,30
S4	–V38	WU40PH	WU40PH	35	**40**	65	mm/rev	0,14–0,21	0,16–0,24	0,18–0,26	0,20–0,30

NOTE: All speed conditions are for stable conditions. For unstable conditions, it is suggested to reduce starting speeds by 10%. For interrupted cuts, reduce by 20%.
For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above data.
For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above data.
For 5 x D, diameter range 25–68mm (inserts sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above data.
For 4 x D and 5 x D, it is recommended to reduce feed rate during entry and exit by 30–50%.

TC4 • Drill Depth • X-Offset Capabilities • Hole Tolerance

Insert size	Diameter range mm (in)	2 x D/3 x D			4 x D			5 x D		
		X-offset value max. in mm (max. in inch)	D1 max value mm (in)	Hole tolerance mm (in)	X-offset value max. in mm (max. in inch)	D1 max value mm (in)	Hole tolerance mm (in)	X-offset value max. in mm (max. in inch)	D1 max value mm (in)	Hole tolerance mm (in)
A	12,00–13,99 (.473–.531)	0,5 (0.020)	D1 + 1mm (D1 + 0.039")	+/- 0,20 (+/- 0.008)	0,5 (0.020)	D1 + 1mm (D1 + 0.039")	+/- 0,35 (+/- 0.014)	–	–	+/- 0,35 (+/- 0.014)
B	14,00–18,99 (.563–.734)	0,5 (0.020)	D1 + 1mm (D1 + 0.039")	+/- 0,20 (+/- 0.008)	0,5 (0.020)	D1 + 1mm (D1 + 0.039")	+/- 0,35 (+/- 0.014)	–	–	+/- 0,35 (+/- 0.014)
C	19,00–23,99 (.750–.938)	0,5 (0.020)	D1 + 1mm (D1 + 0.039")	+/- 0,20 (+/- 0.008)	0,5 (0.020)	D1 + 1mm (D1 + 0.039")	+/- 0,35 (+/- 0.014)	–	–	+/- 0,35 (+/- 0.014)
D	24,00–29,99 (.969–1.156)	0,8 (0.031)	D1 + 1,6mm (D1 + 0.063")	+/- 0,20 (+/- 0.008)	0,8 (0.031)	D1 + 1mm (D1 + 0.039")	+/- 0,35 (+/- 0.014)	–	–	+/- 0,35 (+/- 0.014)
E	30,00–36,99 (1.188–1.438)	0,8 (0.031)	D1 + 1,6mm (D1 + 0.063")	+/- 0,20 (+/- 0.008)	0,8 (0.031)	D1 + 1mm (D1 + 0.039")	+/- 0,35 (+/- 0.014)	–	–	+/- 0,35 (+/- 0.014)
F	37,00–45,99 (1.469–1.750)	0,8 (0.031)	D1 + 1,6mm (D1 + 0.063")	+/- 0,25 (+/- 0.010)	0,8 (0.031)	D1 + 1mm (D1 + 0.039")	+/- 0,38 (+/- 0.015)	–	–	+/- 0,38 (+/- 0.015)
G	46,00–56,99 (1.813–2.219)	1 (0.039)	D1 + 2mm (D1 + 0.079")	+/- 0,25 (+/- 0.010)	0,8 (0.031)	D1 + 1mm (D1 + 0.039")	+/- 0,38 (+/- 0.015)	–	–	+/- 0,38 (+/- 0.015)
H	57,00–68,00 (2.250–2.500)	1 (0.039)	D1 + 2mm (D1 + 0.079")	+/- 0,28 (+/- 0.011)	0,8 (0.031)	D1 + 1mm (D1 + 0.039")	+/- 0,42 (+/- 0.017)	–	–	+/- 0,42 (+/- 0.017)

NOTE: All speed conditions are for stable conditions. For unstable conditions, it is suggested to reduce starting speeds by 10%. For interrupted cuts, reduce by 20%.
For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above data.
For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above data.
For 5 x D, diameter range 25–68mm (inserts sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above data.
For 4 x D and 5 x D, it is recommended to reduce feed rate during entry and exit by 30–50%.

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TAPPING

VARITAP™ • SPIRAL-POINT HSS-E

Pages D4–D6

Materials:

P M K N

The most efficient taps for through holes.

- Shoots chips ahead of the cutting action to reduce overloading and clogging in flutes, protecting the workpiece.
- Extended life in ferrous materials.





VARITAP™ • SPIRAL-FLUTE HSS-E

Pages D7–D9

Materials:

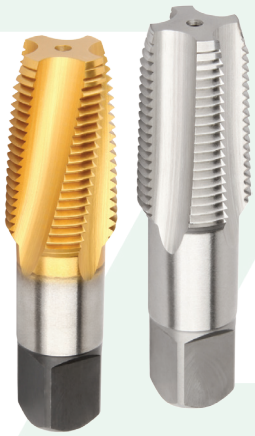
P M K N

Spiral-flute taps are manufactured from high-speed steel (HSS) and are designed for blind-hole applications.

- Stronger, smoother threads.
- Displaces metal while producing no chips.
- Faster tapping speed to double production time.

ALL-STAR

VARITAP™ • STRAIGHT-FLUTE PIPE TAP HSS-E



Page D10

Materials:

P M K N

Manufactured from high-speed steel and available with coolant holes.

- For through- or blind-hole tapping.
- Can be used in general machinery or CNC tapping applications.
- Store chips in their flutes during threading, which protects the workpiece.

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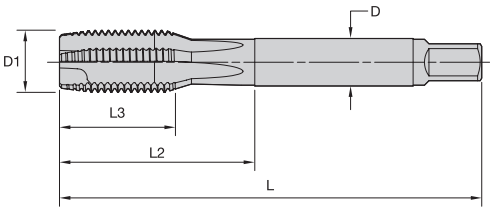
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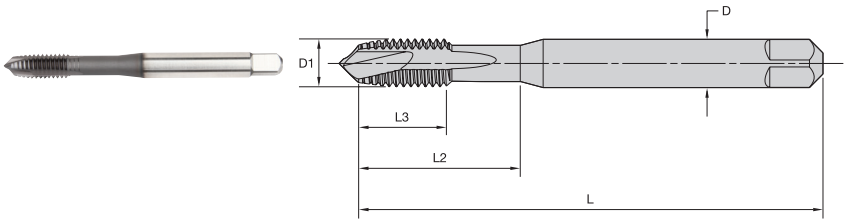


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catalogue number	D1 TPI	L	L2	L3	D	number of flutes	thread type	WU41EG	WP49EG
VTSPO8605	1/8 - 28	90	35	15	7,0	3	G	**6058785**	**6058784**
VTSPO8606	1/4 - 19	100	44	22	11,0	3	G	**6058787**	**6058786**
VTSPO8607	3/8 - 19	100	47	22	12,0	4	G	**6058790**	**6058788**
VTSPO8608	1/2 - 14	125	55	25	16,0	4	G	**6058792**	**6058791**
VTSPO8609	5/8 - 14	125	61	25	18,0	4	G	**6058794**	**6058793**
VTSPO8610	3/4 - 14	140	60	25	20,0	4	G	**6058797**	**6058796**
VTSPO8611	7/8 - 14	150	68	28	22,0	4	G	**6058799**	**6058798**
VTSPO8612	1 - 11	160	68	30	25,0	5	G	**6058811**	**6058800**

VT-SPO • Form B Plug Chamfer • DIN 371 and 376





● first choice
○ alternate choice

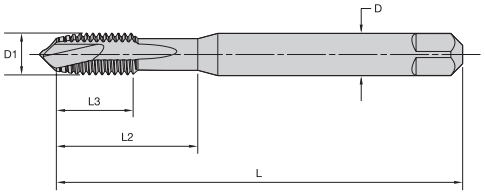
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catalogue number	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit	WP49EG	WU41EG
VTSPO6008	6 - 32	56	9	20	4,0	2	DIN 371	2B	**5387708**	**5472636**
VTSPO6010	6 - 40	56	9	20	4,0	2	DIN 371	2B	**5387760**	**5472638**
VTSPO6011	8 - 32	63	11	21	4,5	2	DIN 371	2B	**5387761**	**5472639**
VTSPO6013	10 - 24	70	12	25	6,0	2	DIN 371	2B	**5387763**	**5472641**
VTSPO6014	10 - 32	70	12	25	6,0	2	DIN 371	2B	**5387764**	**5472644**
VTSPO6016	1/4 - 20	80	15	30	7,0	3	DIN 371	2B	**5387766**	**5472646**
VTSPO6017	1/4 - 28	80	15	30	7,0	3	DIN 371	2B	**5387767**	**5472647**
VTSPO6019	5/16 - 18	90	15	35	8,0	3	DIN 371	2B	**5387769**	**5472649**
VTSPO6020	5/16 - 24	90	15	35	8,0	3	DIN 371	2B	**5387770**	**5472650**
VTSPO6022	3/8 - 16	100	19	39	10,0	3	DIN 371	2B	**5387772**	**5472652**
VTSPO6023	3/8 - 24	100	19	39	10,0	3	DIN 371	2B	**5387773**	**5472653**
VTSPO6025	7/16 - 14	100	18	41	8,0	3	DIN 376	2B	**5387776**	**5472655**
VTSPO6026	7/16 - 20	100	18	41	8,0	3	DIN 376	2B	**5387777**	**5472656**
VTSPO6028	1/2 - 13	110	23	47	9,0	3	DIN 376	2B	**5387779**	**5472658**
VTSPO6029	1/2 - 20	110	23	47	9,0	3	DIN 376	2B	**5387780**	**5472659**
VTSPO6031	9/16 - 12	110	25	53	11,0	3	DIN 376	2B	**5387782**	**5472661**
VTSPO6032	9/16 - 18	110	25	53	11,0	3	DIN 376	2B	**5387783**	**5472662**
VTSPO6033	5/8 - 11	110	24	51	12,0	3	DIN 376	2B	**5387784**	**5472663**
VTSPO6034	5/8 - 18	110	24	51	12,0	3	DIN 376	2B	**5387785**	**5472664**
VTSPO6035	3/4 - 10	140	30	64	16,0	3	DIN 376	2B	**5387786**	**5472665**
VTSPO6036	3/4 - 16	140	30	64	16,0	3	DIN 376	2B	**5387787**	**5472666**

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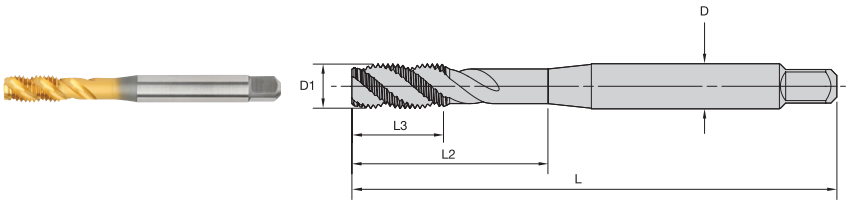


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catalogue number	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit	WP42EG	WU41EG	WP49EG
VTSPO6510	M3 X 0,5	56	8	18	3,5	2	DIN 371	6H	–	5366666	5366668
VTSPO6513	M4 X 0,7	63	11	21	4,5	2	DIN 371	6H	5366676	5366675	5366677
VTSPO6515	M5 X 0,8	70	12	25	6,0	2	DIN 371	6H	5366681	5366680	5366682
VTSPO6517	M6 X 1	80	12	30	6,0	3	DIN 371	6H	5366687	5366686	5366688
VTSPO6521	M8 X 1,25	90	15	35	8,0	3	DIN 371	6H	5366700	5366698	5366701
VTSPO6555	M10 X 1,25	100	18	39	7,0	3	DIN 374	6H	–	–	5368622
VTSPO6523	M10 X 1,5	100	18	39	10,0	3	DIN 371	6H	5366706	5366705	5366707
VTSPO6558	M12 X 1,25	100	21	39	9,0	3	DIN 374	6H	–	–	5368628
VTSPO6559	M12 X 1,5	100	21	39	9,0	3	DIN 374	6H	–	–	5368630
VTSPO6531	M12 X 1,75	110	21	44	9,0	3	DIN 376	6H	5368553	5368552	5368554
VTSPO6561	M14 X 1,25	100	21	47	11,0	3	DIN 374	6H	–	–	5368634
VTSPO6562	M14 X 1,5	100	21	47	11,0	3	DIN 374	6H	–	–	5368636
VTSPO6533	M14 X 2	110	24	52	11,0	3	DIN 376	6H	–	5368557	5368559
VTSPO6564	M16 X 1,5	100	21	46	12,0	3	DIN 374	6H	–	–	5368640
VTSPO6535	M16 X 2	110	24	51	12,0	3	DIN 376	6H	–	5368562	5368565
VTSPO6566	M18 X 1,5	110	21	50	14,0	3	DIN 374	6H	–	–	5368683
VTSPO6537	M18 X 2,5	125	30	58	14,0	3	DIN 376	6H	–	5368568	5368570
VTSPO6538	M20 X 2,5	140	30	64	16,0	3	DIN 376	6H	–	5368572	5368574

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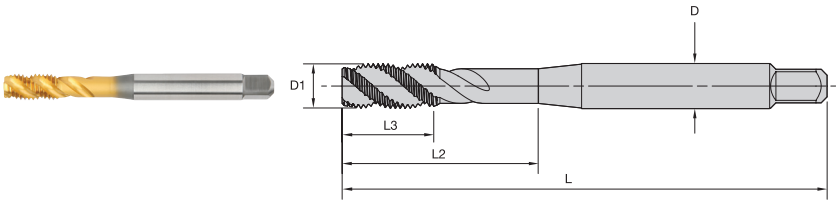
● first choice
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catalogue number	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit	WU41EG	WP49EG
VTSFT-TC6508	M3 X 0,5	56	5	19	3,5	3	DIN 371	6H	6172438	6172436
VTSFT-TC6510	M4 X 0,7	63	7	21	4,5	3	DIN 371	6H	6172442	6172440
VTSFT-TC6511	M5 X 0,8	70	8	26	6,0	3	DIN 371	6H	6172446	6172444
VTSFT-TC6512	M5 X 0,8	70	8	27	3,5	3	DIN 376	6H	6172450	6172448
VTSFT-TC6514	M6 X 1	80	10	30	6,0	3	DIN 371	6H	6172468	6172466
VTSFT-TC6515	M6 X 1	80	10	34	4,5	3	DIN 376	6H	6172470	6172469
VTSFT-TC6516	M8 X 0,75	90	13	37	6,0	3	DIN 374	6H	6172482	–
VTSFT-TC6518	M8 X 1,25	90	13	37	8,0	3	DIN 371	6H	6172486	6172485
VTSFT-TC6519	M8 X 1,25	90	13	37	6,0	3	DIN 376	6H	6172488	6172487
VTSFT-TC6522	M10 X 1,25	100	15	44	7,0	3	DIN 374	6H	6172494	6172493
VTSFT-TC6550	M10 X 1,5	100	15	41	10,0	3	DIN 371	6H	6172496	6172495
VTSFT-TC6524	M10 X 1,5	100	15	44	7,0	3	DIN 376	6H	6172498	6172497
VTSFT-TC6526	M12 X 1,25	100	13	50	9,0	3	DIN 374	6H	6172502	6172501
VTSFT-TC6527	M12 X 1,5	100	13	50	9,0	3	DIN 374	6H	6172504	6172503
VTSFT-TC6528	M12 X 1,75	110	18	55	9,0	3	DIN 376	6H	6172506	6172505
VTSFT-TC6530	M14 X 1,25	100	15	41	11,0	4	DIN 374	6H	6172510	6172509
VTSFT-TC6536	M14 X 1,5	100	15	41	11,0	4	DIN 374	6H	6172512	6172511
VTSFT-TC6532	M14 X 2	110	20	50	11,0	3	DIN 376	6H	6172672	6172671
VTSFT-TC6534	M16 X 1,5	100	15	45	12,0	4	DIN 374	6H	6172674	6172673
VTSFT-TC6564	M16 X 2	110	20	55	12,0	4	DIN 376	6H	6172676	6172675
VTSFT-TC6537	M18 X 1,5	110	17	55	14,0	4	DIN 374	6H	6172678	6172677
VTSFT-TC6538	M18 X 2	125	25	61	14,0	4	DIN 374	6H	6172680	–
VTSFT-TC6539	M18 X 2,5	125	25	61	14,0	4	DIN 376	6H	6172692	6172691
VTSFT-TC6541	M20 X 1,5	125	17	56	16,0	4	DIN 374	6H	6172694	6172693
VTSFT-TC6543	M20 X 2,5	140	25	65	16,0	4	DIN 376	6H	6172698	6172697
VTSFT-TC6549	M24 X 3	160	30	77	18,0	4	DIN 376	6H	–	6172719

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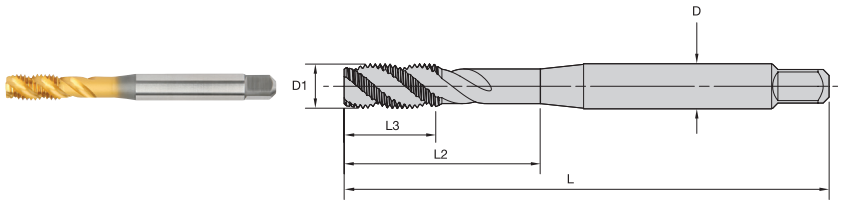
● first choice
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catalogue number	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit	WU41EG	WP49EG
VTSFT-TC6008	6 - 32	56	7	21	4,0	3	DIN 371	2B	**6172748**	**6172747**
VTSFT-TC6009	6 - 40	56	7	21	4,0	3	DIN 371	2B	**6172750**	**6172749**
VTSFT-TC6010	8 - 32	63	7	21	4,5	3	DIN 371	2B	**6172782**	**6172781**
VTSFT-TC6011	8 - 36	63	7	21	4,5	3	DIN 371	2B	**6172784**	**6172783**
VTSFT-TC6012	10 - 24	70	8	25	6,0	3	DIN 371	2B	**6172786**	**6172785**
VTSFT-TC6013	10 - 32	70	8	25	6,0	3	DIN 371	2B	**6172788**	**6172787**
VTSFT-TC6016	1/4 - 20	80	10	29	7,0	3	DIN 371	2B	**6172794**	**6172793**
VTSFT-TC6018	1/4 - 28	80	10	29	7,0	3	DIN 371	2B	**6172798**	**6172797**
VTSFT-TC6052	5/16 - 18	90	13	37	8,0	3	DIN 371	2B	**6172802**	**6172801**
VTSFT-TC6054	5/16 - 24	90	13	37	6,0	3	DIN 374	2B	**6172806**	**6172805**
VTSFT-TC6056	3/8 - 16	100	15	42	10,0	3	DIN 371	2B	**6172808**	**6172807**
VTSFT-TC6058	3/8 - 24	90	15	40	7,0	3	DIN 374	2B	**6172812**	**6172811**
VTSFT-TC6060	7/16 - 14	100	15	47	8,0	3	DIN 376	2B	**6172814**	**6172813**
VTSFT-TC6027	7/16 - 20	100	15	47	8,0	3	DIN 374	2B	**6172816**	**6172815**
VTSFT-TC6062	1/2 - 13	110	18	50	9,0	3	DIN 376	2B	**6172818**	**6172817**
VTSFT-TC6029	1/2 - 20	100	13	44	9,0	3	DIN 374	2B	**6172820**	**6172819**
VTSFT-TC6030	9/16 - 12	110	20	55	11,0	4	DIN 376	2B	**6172837**	**6172836**
VTSFT-TC6031	9/16 - 18	100	15	44	11,0	4	DIN 374	2B	**6172839**	**6172838**
VTSFT-TC6032	5/8 - 11	110	20	55	12,0	4	DIN 376	2B	**6172911**	**6172840**
VTSFT-TC6033	5/8 - 18	100	15	45	12,0	4	DIN 374	2B	**6172913**	**6172912**
VTSFT-TC6034	3/4 - 10	125	25	65	14,0	4	DIN 376	2B	**6172915**	**6172914**
VTSFT-TC6035	3/4 - 16	110	17	55	14,0	4	DIN 374	2B	**6172917**	**6172916**

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VT-SFT • Form C Semi-Bottoming Chamfer • Metric DIN 371, 374, and 376





● first choice
○ alternate choice

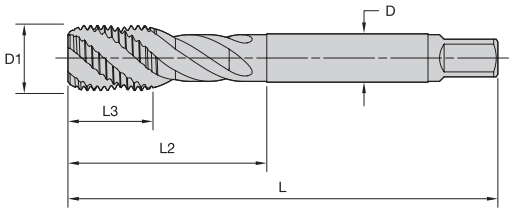
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catalogue number	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit	WU41EG	WP49EG
VTSFT6511	M3 X 0,5	56	8	18	3,5	2	DIN 371	6H	–	5368724
VTSFT6514	M4 X 0,7	63	11	21	4,5	3	DIN 371	6H	–	5368732
VTSFT6516	M5 X 0,8	70	12	25	6,0	3	DIN 371	6H	–	5368737
VTSFT6518	M6 X 1	80	12	30	6,0	3	DIN 371	6H	–	5368742
VTSFT6521	M8 X 1,25	90	15	35	8,0	3	DIN 371	6H	5368748	5368750
VTSFT6523	M10 X 1,5	100	18	39	10,0	3	DIN 371	6H	5368753	5368755
VTSFT6556	M12 X 1,25	100	21	39	9,0	3	DIN 374	6H	–	5402199
VTSFT6557	M12 X 1,5	100	21	39	9,0	3	DIN 374	6H	–	5402202
VTSFT6531	M12 X 1,75	110	21	44	9,0	3	DIN 376	6H	5402259	5402261
VTSFT6560	M14 X 1,5	100	21	47	11,0	3	DIN 374	6H	–	5402207
VTSFT6533	M14 X 2	110	24	52	11,0	3	DIN 376	6H	5402264	5402266
VTSFT6562	M16 X 1,5	100	21	46	12,0	3	DIN 374	6H	–	5402210
VTSFT6535	M16 X 2	110	24	51	12,0	3	DIN 376	6H	5402269	5402270
VTSFT6564	M18 X 1,5	110	21	50	14,0	4	DIN 374	6H	–	5402214
VTSFT6538	M20 X 2,5	140	30	64	16,0	4	DIN 376	6H	–	5402277

NOTE: Suggested for use in rigid and synchronous holders.

VT-SFT • Form C Semi-Bottoming Chamfer • DIN EN ISO 228







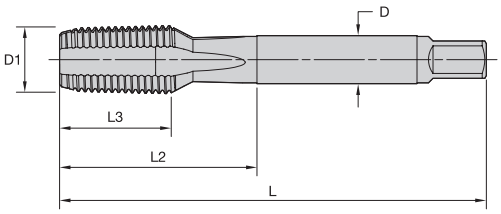
● first choice
○ alternate choice

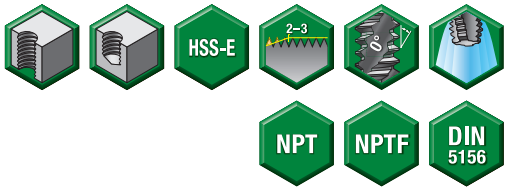
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S			
H			

catalogue number	D1 TPI	L	L2	L3	D	number of flutes	thread type	WU41EG	WP49EG
VTSFT8605	1/8 - 28	90	35	15	7,0	3	G	6058815	6058814
VTSFT8606	1/4 - 19	100	44	15	11,0	3	G	6058817	6058816
VTSFT8607	3/8 - 19	100	47	15	12,0	4	G	6058819	6058818
VTSFT8608	1/2 - 14	125	55	18	16,0	4	G	6058871	6058820
VTSFT8610	3/4 - 14	140	65	20	20,0	4	G	6058875	6058874
VTSFT8612	1 - 11	160	74	24	25,0	5	G	6058879	–

VT-STR • Form C Semi-Bottoming Chamfer • NPT and NPTF







● first choice
○ alternate choice

P		○
M		○
K		○
N		○
S		
H		

catalogue number	D1 TPI	L	L2	L3	D	number of flutes	thread type	WU40EG
VTSTR8301	1/16 - 27	90	35	13	6,0	3	NPT	**6058953**
VTSTR8302	1/8 - 27	90	36	13	7,0	4	NPT	**6058954**
VTSTR8303	1/4 - 18	100	39	20	11,0	4	NPT	**6058955**
VTSTR8307	1 - 11.5	160	71	32	25,0	5	NPT	**6058959**

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Application Data • HSS-E • Metric

Material Group		Through Holes					Blind Holes				
				Range — m/min					Range — m/min		
		Tap Style	Grade	min	Starting Value	max	Tap Style	Grade	min	Starting Value	max
P	P1	VT-SPO	WP42EG, WU41EG	21	**27**	34	VT-SFT	WP42EG, WU41EG	13	**18**	26
		VT-SPO	WP49EG, WU40EG	10	**14**	17	VT-SFT	WP49EG, WU40EG	6	**9**	13
	P2	VT-SPO	WP42EG, WU41EG	16	**21**	27	VT-SFT	WP42EG, WU41EG	11	**15**	22
		VT-SPO	WP49EG, WU40EG	8	**11**	13	VT-SFT	WP49EG, WU40EG	4	**6**	9
	P3	VT-SPO	WP42EG, WU41EG	9	**12**	15	VT-SFT	WP42EG, WU41EG	6	**9**	13
		VT-SPO	WP49EG, WU40EG	5	**6**	8	VT-SFT	WP49EG, WU40EG	2	**3**	4
		VT-STR NPT	WU41EG	5	**6**	8	VT-STR NPT	WU41EG	5	**6**	8
		VT-STR NPT	WU40EG	2	**3**	4	VT-STR NPT	WU40EG	2	**3**	4
M	M1	VT-SPO	WP42EG, WU41EG	9	**12**	15	VT-SFT	WP42EG, WU41EG	6	**9**	13
		VT-SPO	WP49EG, WU40EG	5	**6**	8	VT-SFT	WP49EG, WU40EG	2	**3**	4
		VT-SFT NPT	WU41EG	5	**6**	8	VT-SFT NPT	WU41EG	5	**6**	8
		VT-SFT NPT	WP49EG, WU40EG	2	**3**	4	VT-SFT NPT	WP49EG, WU40EG	2	**3**	4
	M3	VT-SPO	WP42EG, WU41EG	7	**9**	11	VT-SFT	WP42EG, WU41EG	4	**6**	9
		VT-SPO	WP49EG, WU40EG	3	**5**	6	VT-SFT	WP49EG, WU40EG	2	**3**	4
K	K1	VT-STR NPT	WU41EG	10	**14**	17	VT-STR NPT	WU41EG	10	**14**	17
		VT-STR NPT	WU40EG	6	**8**	10	VT-STR NPT	WU40EG	6	**8**	10
	K2	VT-SPO	WP42EG, WU41EG	21	**27**	34	VT-SFT	WP42EG, WU41EG	13	**18**	26
		VT-SPO	WP49EG, WU40EG	10	**14**	17	VT-SFT	WP49EG, WU40EG	6	**9**	13
N	N1	VT-SPO	WP42EG, WU41EG	34	**46**	57	VT-SFT	WP42EG, WU41EG	23	**34**	48
		VT-SPO	WU40EG	17	**23**	29	VT-SFT	WU40EG	11	**15**	22
	N2	VT-SPO	WP42EG, WU41EG	30	**40**	50	VT-SFT	WP42EG, WU41EG	19	**27**	39
		VT-SPO	WU40EG	15	**20**	25	VT-SFT	WU40EG	11	**15**	22
	N4	VT-SPO	WP42EG, WU41EG	7	**9**	11	VT-SFT	WP42EG, WU41EG	4	**6**	9
		VT-SPO	WU40EG	3	**5**	6	VT-SFT	WU40EG	2	**3**	4

** Grades: WP42EG = TiCN*
WU41EG = TiN
WP49EG = oxide
WU40EG = bright

Tap Recommendations for Classes 2B and 3B

▼ Unified Inch Screw Threads

thread size/pitch	recommended tap limits[1] class 2B	recommended tap limits[1] class 3B	internal thread pitch diameter limits min all classes (Basic)	internal thread pitch diameter limits max class 2B	internal thread pitch diameter limits max class 3B
0 - 80	H2	H2	0.0519	0.0542	0.0536
1 - 64	H2	H2	0.0629	0.0655	0.0648
1 - 72	H2	H2	0.0640	0.0665	0.0659
2 - 56	H2	H2	0.0744	0.0772	0.0765
2 - 64	H2	H2	0.0759	0.0786	0.0779
3 - 48	H3	H2	0.0855	0.0885	0.0877
3 - 56	H2	H2	0.0874	0.0902	0.0895
4 - 40	H3	H2	0.0958	0.0991	0.0982
4 - 48	H3	H2	0.0985	0.1016	0.1008
5 - 40	H3	H2	0.1088	0.1121	0.1113
5 - 44	H3	H2	0.1102	0.1134	0.1126
6 - 32	H3	H2	0.1177	0.1214	0.1204
6 - 40	H3	H2	0.1218	0.1252	0.1243
8 - 32	H3	H3	0.1437	0.1475	0.1465
8 - 36	H3	H3	0.1460	0.1496	0.1487
10 - 24	H3	H3	0.1629	0.1672	0.1661
10 - 32	H3	H3	0.1697	0.1736	0.1726
12 - 24	H3	H3	0.1889	0.1933	0.1922
12 - 28	H3	H3	0.1928	0.1970	0.1959
1/4 - 20	H5	H3	0.2175	0.2224	0.2211
1/4 - 28	H4	H3	0.2268	0.2311	0.2300
5/16 - 18	H5	H3	0.2764	0.2817	0.2803
5/16 - 24	H4	H3	0.2854	0.2902	0.2890
3/8 - 16	H5	H3	0.3344	0.3401	0.3387
3/8 - 24	H4	H3	0.3479	0.3528	0.3516
7/16 - 14	H5	H3	0.3911	0.3972	0.3957
7/16 - 20	H5	H3	0.4050	0.4104	0.4091
1/2 - 13	H5	H4	0.4500	0.4565	0.4548
1/2 - 20	H5	H3	0.4675	0.4731	0.4717
9/16 - 12	H5	H4	0.5084	0.5152	0.5135
9/16 - 18	H5	H3	0.5264	0.5323	0.5308
5/8 - 11	H5	H4	0.5660	0.5732	0.5714
5/8 - 18	H5	H3	0.5889	0.5949	0.5934
3/4 - 10	H5	H4	0.6850	0.6927	0.6907

[1]Tap H limit selected for 3B will also produce thread to 2B.

NOTE: The above recommended taps normally produce the class of thread indicated in average materials when used with reasonable care. However, if the specified tap does not provide a satisfactory gage fit, choose an alternate tap limit.

Tap Recommendations for Classes 2B and 3B

▼ Unified Inch Screw Threads

thread size/pitch	recommended tap limits[1] class 2B	recommended tap limits[1] class 3B	internal thread pitch diameter limits min all classes (Basic)	internal thread pitch diameter limits max class 2B	internal thread pitch diameter limits max class 3B
3/4 - 16	H5	H4	0.7094	0.7159	0.7143
7/8 - 9	H6	H4	0.8028	0.8110	0.8089
7/8 - 14	H6	H4	0.8286	0.8356	0.8339
1" - 8	H6	H5	0.9188	0.9276	0.9254
1" - 12	H6	H4	0.9459	0.9535	0.9516
1-1/8 - 7	H8	H6	1.0322	1.0416	1.0393
1-1/8 - 8	H8	H6	1.0438	1.0528	1.0505
1-1/8 - 12	H6	H5	1.0709	1.0787	1.0768
1-1/4 - 7	H8	H6	1.1572	1.1668	1.1644
1-1/4 - 8	H8	H6	1.1688	1.1780	1.1757
1-1/4 - 12	H6	H5	1.1959	1.2039	1.2019
1-3/8 - 6	H8	H6	1.2667	1.2771	1.2745
1-3/8 - 8	H8	H6	1.2938	1.3031	1.3008
1-3/8 - 12	H6	H5	1.3209	1.3291	1.3270
1-1/2 - 6	H8	H6	1.3917	1.4022	1.3996
1-1/2 - 8	H8	H6	1.4188	1.4283	1.4259
1-1/2 - 12	H6	H5	1.4459	1.4542	1.4522
1-3/4 - 5	H8	H7	1.6201	1.6317	1.6288
2 - 4 1/2	H8	H7	1.8557	1.8681	1.8650

[1]Tap H limit selected for 3B will also produce thread to 2B.

Tap Recommendations for Class 6H Metric Screw Threads

thread size nominal diameter (mm)	thread size pitch (mm)	recommended tap limit number	internal thread product limits — class 6H pitch diameter (mm) min	pitch diameter (mm) max	pitch diameter (in) min	pitch diameter (in) max
1,6 2 2,5	0,35 0,4 0,45	D3 D3 D3	1,373 1,740 2,208	1,458 1,830 2,303	.05406 .06850 .08693	.05740 .07205 .09067
3 3,5 4	0,5 0,6 0,7	D3 D4 D4	2,675 3,110 3,545	2,775 3,222 3,663	.10531 .12244 .13957	.10925 .12685 .14421
4,5 5 6	0,75 0,8 1	D4 D4 D5	4,013 4,480 5,350	4,131 4,605 5,500	.15789 .17638 .21063	.16264 .18130 .21654
7 8 10	1 1,25 1,5	D5 D5 D6	6,350 7,188 9,026	6,500 7,348 9,206	.25000 .28299 .35535	.25591 .28929 .36244
12 14 16	1,75 2 2	D6 D7 D7	10,863 12,701 14,701	11,063 12,913 14,913	.42768 .50004 .57878	.43555 .50839 .58713
20 24 30	2,5 3 3,5	D7 D8 D9	18,376 22,051 27,727	18,600 22,316 28,007	.72346 .86815 1.09161	.73228 .87858 1.10264
36	4	D9	33,402	33,702	1.31504	1.32685

Decimal Equivalents

drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)
0,30mm	.0118	54	.0550	3,10mm	.1220	5,50mm	.2165	8,50mm	.3346	9/16	.5625
0,32mm	.0126	1,40mm	.0551	1/18	.1250	7/32	.2188	8,60mm	.3386	14,50mm	.5709
80	.0135	1,45mm	.0571	3,20mm	.1260	5,60mm	.2205	R	.3390	37/64	.5781
0,35mm	.0138	1,50mm	.0591	30	.1285	2	.2210	8,70mm	.3425	14,75mm	.5807
79	.0145	53	.0595	3,30mm	.1299	5,70mm	.2244	11/32	.3438	15,00mm	.5906
0,38mm	.0150	1,55mm	.0610	3,40mm	.1339	1	.2280	8,80mm	.3465	19/32	.5938
1/64	.0156	1/16	.0625	29	.1360	5,80mm	.2283	S	.3480	15,25mm	.6004
0,40mm	.0157	1,60mm	.0630	3,50mm	.1378	5,90mm	.2323	8,90mm	.3504	39/64	.6094
78	.0160	52	.0635	28	.1405	A	.2340	9,00mm	.3543	15,50mm	.6102
0,42mm	.0165	1,65mm	.0650	9/64	.1406	15/64	.2344	T	.3580	15,75mm	.6201
0,45mm	.0177	1,70mm	.0669	3,60mm	.1417	6,00mm	.2362	9,10mm	.3583	5/8	.6250
77	.0180	51	.0670	27	.1440	B	.2380	23/64	.3594	16,00mm	.6299
0,48mm	.0189	1,75mm	.0689	3,70mm	.1457	6,10mm	.2402	9,20mm	.3622	16,25mm	.6398
0,50mm	.0197	50	.0700	26	.1470	C	.2420	9,30mm	.3661	41/64	.6406
76	.0200	1,80mm	.0709	25	.1495	6,20mm	.2441	U	.3680	16,50mm	.6496
75	.0210	1,85mm	.0728	3,80mm	.1496	D	.2460	9,40mm	.3701	21/32	.6562
0,55mm	.0217	49	.0730	24	.1520	6,30mm	.2480	9,50mm	.3740	16,75mm	.6594
74	.0225	1,90mm	.0748	3,90mm	.1535	1/4, E	.2500	3/8	.3750	17,00mm	.6693
0,60mm	.0236	48	.0760	23	.1540	6,40mm	.2520	V	.3770	43/64	.6719
73	.0240	1,95mm	.0768	5/32	.1562	6,50mm	.2559	9,60mm	.3780	17,25mm	.6791
0,62mm	.0244	5/64	.0781	22	.1570	F	.2570	9,70mm	.3819	11/16	.6875
72	.0250	47	.0785	4,00mm	.1575	6,60mm	.2598	9,80mm	.3858	17,50mm	.6890
0,65mm	.0256	2,00mm	.0787	21	.1590	G	.2610	W	.3860	45/64	.7031
71	.0260	2,05mm	.0807	20	.1610	6,70mm	.2638	9,90mm	.3898	18,00mm	.7087
0,70mm	.0276	46	.0810	4,10mm	.1614	17/64	.2656	25/64	.3906	23/32	.7188
70	.0280	45	.0820	4,20mm	.1654	H	.2660	10,00mm	.3937	18,50mm	.7283
69	.0292	2,10mm	.0827	19	.1660	6,80mm	.2677	X	.3970	47/64	.7344
0,75mm	.0295	2,15mm	.0846	4,30mm	.1693	6,90mm	.2717	10,20mm	.4016	19,00mm	.7480
68	.0310	44	.0860	18	.1695	I	.2720	Y	.4040	3/4	.7500
1/32	.0312	2,20mm	.0866	11/64	.1719	7,00mm	.2756	13/32	.4062	49/64	.7656
0,80mm	.0315	2,25mm	.0886	17	.1730	J	.2770	Z	.4130	19,50mm	.7677
67	.0320	43	.0890	4,40mm	.1732	7,10mm	.2795	10,50mm	.4134	25/32	.7812
66	.0330	2,30mm	.0906	16	.1770	K	.2810	27/64	.4219	20,00mm	.7874
0,85mm	.0335	2,35mm	.0925	4,50mm	.1772	9/32	.2812	10,80mm	.4252	51/64	.7969
65	.0350	42	.0935	15	.1800	7,20mm	.2835	11,00mm	.4331	20,50mm	.8071
0,90mm	.0354	3/32	.0938	4,60mm	.1811	7,30mm	.2874	7/16	.4375	13/16	.8125
64	.0360	2,40mm	.0945	14	.1820	L	.2900	11,20mm	.4409	21,00mm	.8268
63	.0370	41	.0960	4,70mm, 13	.1850	7,40mm	.2913	11,50mm	.4528	53/64	.8281
0,95mm	.0374	2,45mm	.0965	3/16	.1875	M	.2950	29/64	.4531	27/32	.8438
62	.0380	40	.0980	4,80mm, 12	.1890	7,50mm	.2953	11,80mm	.4646	21,50mm	.8465
61	.0390	2,50mm	.0984	11	.1910	19/64	.2969	15/32	.4688	55/64	.8594
1,00mm	.0394	39	.0995	4,90mm	.1929	7,60mm	.2992	12,00mm	.4724	22,00mm	.8661
60	.0400	38	.1015	10	.1935	N	.3020	12,20mm	.4803	7/8	.8750
59	.0410	2,60mm	.1024	9	.1960	7,70mm	.3031	31/64	.4844	22,50mm	.8858
1,05mm	.0413	37	.1040	5,00mm	.1969	7,80mm	.3071	12,50mm	.4921	57/64	.8906
58	.0420	2,70mm	.1063	8	.1990	7,90mm	.3110	1/2	.5000	23,00mm	.9055
57	.0430	36	.1065	5,10mm	.2008	5/16	.3125	12,80mm	.5039	29/32	.9062
1,10mm	.0433	7/64	.1094	7	.2010	8,00mm	.3150	13,00mm	.5118	59/64	.9219
1,15mm	.0453	35	.1100	13/64	.2031	O	.3160	33/64	.5156	23,50mm	.9252
56	.0465	2,80mm	.1102	6	.2040	8,10mm	.3189	13,20mm	.5197	15/16	.9375
3/64	.0469	34	.1110	5,20mm	.2047	8,20mm	.3228	17/32	.5312	24,00mm	.9449
1,20mm	.0472	33	.1130	5	.2055	P	.3230	13,50mm	.5315	61/64	.9531
1,25mm	.0492	2,90mm	.1142	5,30mm	.2087	8,30mm	.3268	13,80mm	.5433	24,50mm	.9646
1,30mm	.0512	32	.1160	4	.2090	21/64	.3281	35/64	.5469	31/32	.9688
55	.0520	3,00mm	.1181	5,40mm	.2126	8,40mm	.3307	14,00mm	.5512	25,00mm	.9843
1,35mm	.0531	31	.1200	3	.2130	Q	.3320	14,25mm	.5610	63/64	.9844
–	–	–	–	–	–	–	–	–	–	1"	1.0000

Metric Fractional Wire gage Letter size

ONE SOURCE, MANY APPLICATIONS

WIDIA™ APPROVED TAP/DRILL COMBINATIONS:

VariDrill™/VariTap™

P M K N S



Versatile:

VariDrill™ drilling tools, in combination with VariTap™ tapping tools, are designed for productivity in an array of different materials. These tools feature strong geometries that are ideal for small-batch and varied production.

TOP DRILL S™/GT Series

P
TDS401
TDS402
TDS403
GT00, 20, 24 Spiral Point
GT30, 32, 50 Spiral Flute
GT23, 24, 25 Forming



M
TDS451
TDS452
TDS453
GT20
GT30



K
TDS411
TDS412
TDS413
GT40
GT41



N
TDS421
TDS422
GT70
GT80
GT22
GT40



S
TDS451
TDS452
TDS453
GT60
GT90
GT62
GT92



Optimised:

TOP DRILL S™ drills, combined with GT Series Taps:

This combination is designed for, but not limited to, material-specific applications with medium to large batch production.

For more than 90 years, WIDIA has defined excellence in innovation, technology, and customer service. As an industry-leading manufacturer of cutting tools, WIDIA offers a complete portfolio of precision-engineered products. With drilling, tapping and tooling systems products, you will find everything you need from one single source.

- Extensive Portfolio
- Expertise
- Customised Solutions

widia.com

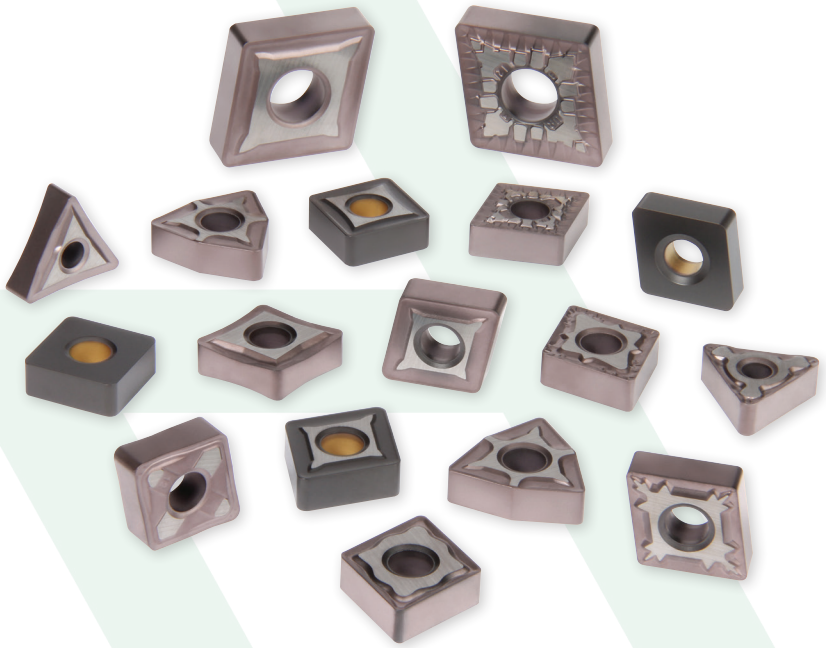
WIDIA™

TURNING

HIGH-PERFORMANCE INSERTS

Pages E6–E76

WIDIA™ Victory™ Inserts
Machining Aluminium
External Turning
Internal Turning

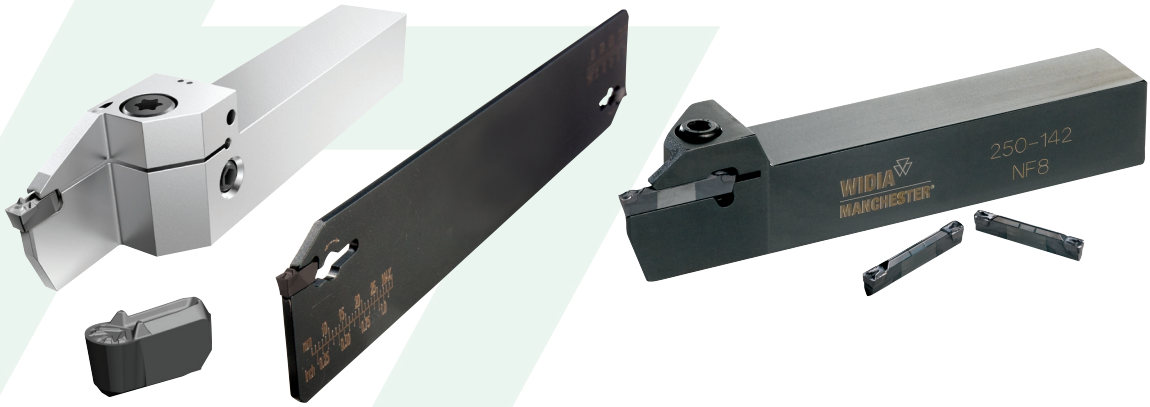


ALL-STAR

GROOVING & CUT-OFF

Pages E78–E100

WGC
WMT™



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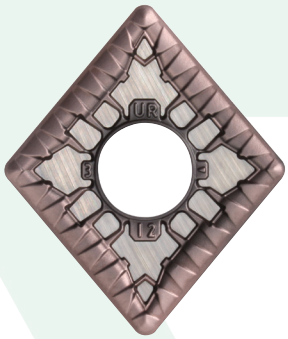
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HIGH-PERFORMANCE INS

WIDIA™ VICTORY™ INSERTS

Pages E6–E56

A complete high-performance turning portfolio.





MACHINING ALUMINIUM

Pages E58–E60

A complete high-performance turning portfolio.

EXTERNAL TURNING

Pages E62–E70

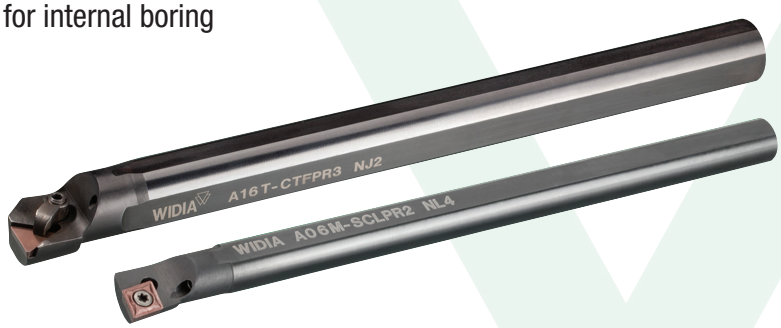
Tools for external turning



INTERNAL BORING

Pages E72–E76

Tools for internal boring



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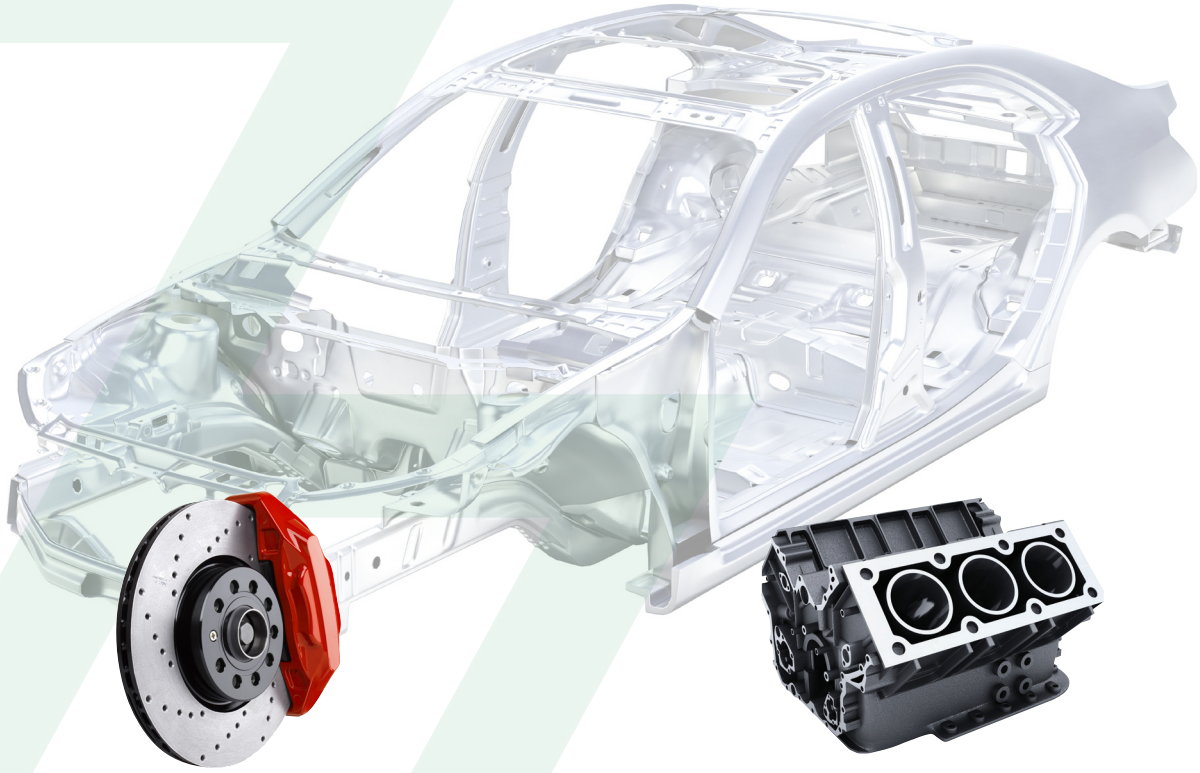
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Download for iOS or Android:
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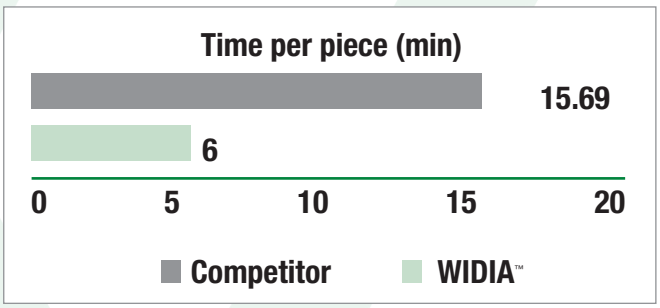
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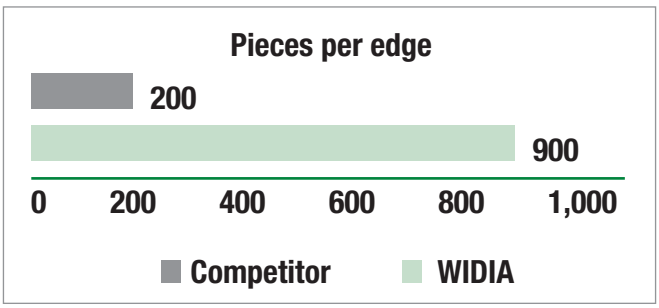
AUTOMOTIVE



Brakes and Steering Success Story:
Victory™ — RH Chipbreaker

Engine Block Success Story:
Victory Grade WK15CT





	COMPETITOR	WIDIA
Tool	–	CNMG434RH
Grade	–	WP15CT
Cutting Speed Vc	60.96 m/min (200 sfm)	39.62 m/min (130 sfm)
Feet per tooth f	0.102 mm (0.004")	0.203 mm (0.008")
Depth of cut ap	1.016 mm (0.04")	0.889 mm (0.035")
Length of cut L	101.6 mm (4")	
Number of passes	4	2
Coolant	Dry	
Time per piece	15.69	6.02

	COMPETITOR	WIDIA
Tool	–	SCMT3252
Grade	–	WK15CT
Cutting Speed Vc	152.4 m/min (500 sfm)	
Feet per tooth f	0.254 mm (0.01")	
Depth of cut ap	1.905 mm (0.075")	
Length of cut L	50.8 mm (2")	
Number of passes	1	
Coolant	External Cutting Oil	
Time per piece	200	900

Victory™ Turning

Victory turning inserts provide excellent tool life with superior surface finish in rough and finish turning of all types of workpiece materials.

Materials:

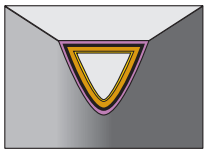
P M K N S

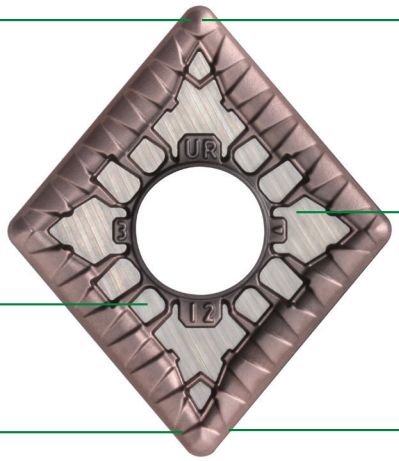
- Reduced cycle times: high speed and feed capabilities.
- Long tool life: new multilayer coating provides better wear resistance.
- Proven seating: smooth and secure seating surface.
- Specifically engineered multilayer coating and chip groove geometries provide high-speed capability with effective chipbreaking for finishing to roughing operations.

Post-coat treatment
- Improves edge toughness.
- Long, predictable tool life.
- Reduces depth-of-cut notching.
- Wide range of applications.

New geometry identification system.

MT-CVD/CVD–TiN-TiCN-Al_2O_3-ZrCN



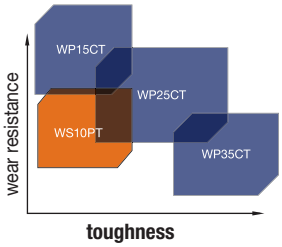


Improved edge toughness
- Provides smooth outer surface to reduce forces, friction, and workpiece sticking.

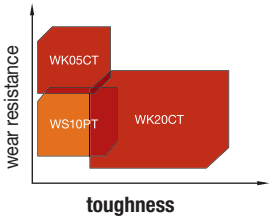
Post-coat grinding
- Provides secure seating surface.

Alpha alumina layer
- Provides coating integrity at elevated speeds.
- Higher productivity and dependability at high cutting temperatures.

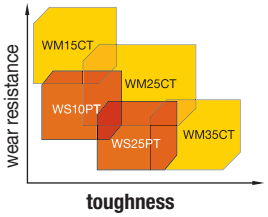
Victory Toughness/Wear Resistance



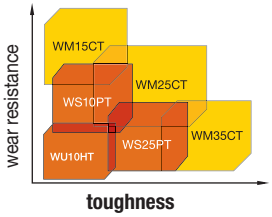
WP Grades for Steel
- Three grades and seven primary geometries for use in roughing to finishing operations.
- Increase cutting speed and/or feed rate to gain productivity.



WK Grades for Cast Iron
- Two grades to cover all of your cast iron turning operations.
- Very good balance of wear resistance and toughness for long predictable tool life. Flat top geometry for machining cast iron. For finishing to roughing applications.
- New grade WK15CT.



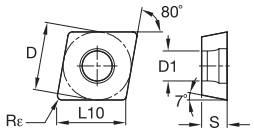
WM Grades for Stainless Steel
- Three grades across 12 geometries for use in roughing to finishing operations.
- Increase cutting speed and/or feed rate by up to 30% over similar competitive grades.



WS Grades for High-Temp Alloys
- Two grades for use in roughing to finishing operations.
- Very good wear resistance for longer tool life.
- One uncoated grade for use in titanium.

CCMT-FP





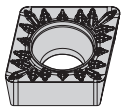
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○ alternate choice

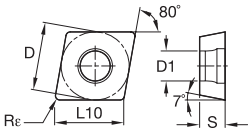
		WP15CT	WP25CT	WM15CT	WM25CT	WK20CT	WS10PT	WS25PT
P		●	●	○	○	○	○	○
M				●	●		●	●
K		○	○			●	○	○
N							○	○
S					○		●	●
H								

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM15CT	WM25CT	WK20CT	WS10PT	WS25PT
CCMT060202FP	6,35	6,45	2,38	0,2	2,80	4169857	4170140	-	4168778	-	-	-
CCMT060204FP	6,35	6,45	2,38	0,4	2,80	4169858	4170141	-	4168779	4170032	5684337	5684340
CCMT060208FP	6,35	6,45	2,38	0,8	2,80	-	4170142	-	4168780	-	-	-
CCMT09T302FP	9,53	9,67	3,97	0,2	4,40	-	-	-	4168781	-	-	-
CCMT09T304FP	9,53	9,67	3,97	0,4	4,40	4169860	4170294	-	4168782	4170084	5684341	5684343
CCMT09T308FP	9,53	9,67	3,97	0,8	4,40	4169861	4170295	4168741	-	4170085	-	5684338
CCMT120404FP	12,70	12,90	4,76	0,4	5,50	-	4170296	-	4168784	-	-	-
CCMT120408FP	12,70	12,90	4,76	0,8	5,50	-	4170297	-	-	-	-	-

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CCMT-MP





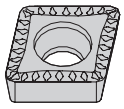
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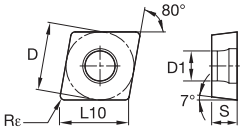
P		●	●	○	○	○
M				●		●
K		○	○		●	○
N						○
S				○		●
H						

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT	WS10PT
CCMT060204MP	6,35	6,45	2,38	0,4	2,80	4170197	4170217	4168906	4170237	5684351
CCMT09T304MP	9,53	9,67	3,97	0,4	4,40	4170198	4170218	4168907	-	-
CCMT09T308MP	9,53	9,67	3,97	0,8	4,40	4170199	4170219	4168908	4170239	-
CCMT09T312MP	9,53	9,67	3,97	1,2	4,40	-	-	4168909	-	-
CCMT120408MP	12,70	12,90	4,76	0,8	5,50	4170200	4170221	-	4170240	-
CCMT120412MP	12,70	12,90	4,76	1,2	5,50	-	4170222	-	4170241	-

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CCMT-MU



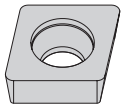


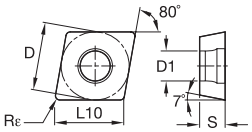
● first choice
○ alternate choice

		WP15CT	WP25CT	WP35CT	WM25CT	WK20CT	WS10PT	WS25PT
P		●	●	●	○	○	○	○
M					○	●		●	●
K		○	○			●	○	○
N							○	○
S					○		●	●
H								

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT	WK20CT	WS10PT	WS25PT
CCMT090304MU	9,53	9,67	3,18	0,4	4,40	-	5623420	-	5623421	-	-	-
CCMT090308MU	9,53	9,67	3,18	0,8	4,40	5623425	5623424	-	5623423	-	-	-
CCMT09T304MU	9,53	9,67	3,97	0,4	4,40	5623431	5623430	-	5623427	5623432	5623428	5623426
CCMT09T308MU	9,53	9,67	3,97	0,8	4,40	5623434	5623436	5623439	5623435	5623433	5623438	5623437
CCMT120404MU	12,70	12,90	4,76	0,4	5,50	-	-	-	6128254	-	-	-
CCMT120408MU	12,70	12,90	4,76	0,8	5,50	-	5623443	-	5623442	5623441	-	5623444

CCMW



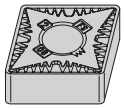


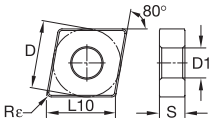
● first choice
○ alternate choice

P	○
M	
K	●
N	
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H	

ISO catalogue number	D	L10	S	Rε	D1	WK20CT
CCMW090304	9,53	9,67	3,18	0,4	4,40	4170369
CCMW090308	9,53	9,67	3,18	0,8	4,40	4170370
CCMW09T304	9,53	9,67	3,97	0,4	4,40	4170371

CNGG-FS





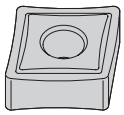
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○ alternate choice

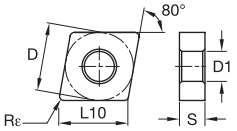
P	○	○
M	●	●
K	○	○
N	○	○
S	●	●
H		

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT
CNGG120401FS	12,70	12,90	4,76	0,1	5,16	5548576	-
CNGG120402FS	12,70	12,90	4,76	0,2	5,16	5548575	-
CNGG120404FS	12,70	12,90	4,76	0,4	5,16	5548577	5538204
CNGG120408FS	12,70	12,90	4,76	0,8	5,16	5548578	-

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CNGP



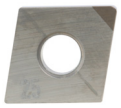


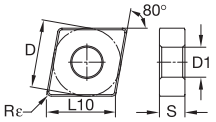
● first choice
○ alternate choice

P	○	○
M	●	●
K	○	
N	○	○
S	●	●
H		

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WU10HT
CNGP120401	12,70	12,90	4,76	0,1	5,16	5549137	-
CNGP120404	12,70	12,90	4,76	0,4	5,16	5549139	5549207
CNGP120408	12,70	12,90	4,76	0,8	5,16	5549190	5549208

CNMA



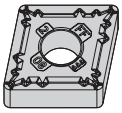


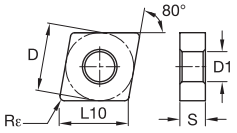
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WK05CT	WK20CT
CNMA120408	12,70	12,90	4,76	0,8	5,16	4171596	4171864
CNMA120412	12,70	12,90	4,76	1,2	5,16	4171597	4171865
CNMA120416	12,70	12,90	4,76	1,6	5,16	-	4171866
CNMA160612	15,88	16,12	6,35	1,2	6,35	-	4171868
CNMA160616	15,88	16,12	6,35	1,6	6,35	-	4171869
CNMA190612	19,05	19,34	6,35	1,2	7,93	-	4171871
CNMA190616	19,05	19,34	6,35	1,6	7,93	-	4171872

CNMG-FF



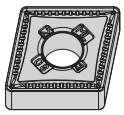


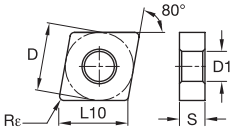
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WP15CT
CNMG120408FF	12,70	12,90	4,76	0,8	5,16	4171026

CNMG-ML



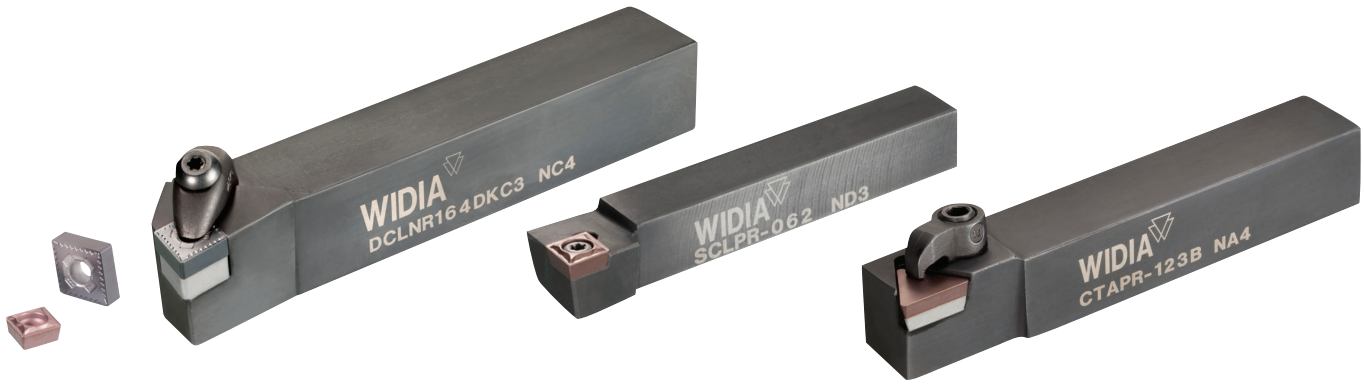


● first choice
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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WK05CT	WK20CT
CNMG120404ML	12,70	12,90	4,76	0,4	5,16	4171059	4170458	-	4171390
CNMG120408ML	12,70	12,90	4,76	0,8	5,16	4171060	4170459	4171658	4171391
CNMG120412ML	12,70	12,90	4,76	1,2	5,16	-	4170460	-	4171392

HOLDERS AND CLAMP STYLES



D-Style Clamping

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

P-Style Clamping

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.

P-style available in metric sizes only.

S-Style Clamping

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

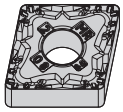
C-Style Clamping

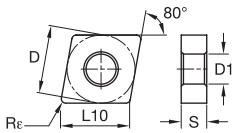
- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

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CNMG-MR





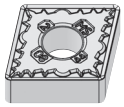
● first choice
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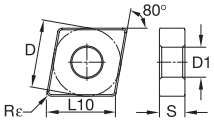
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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
CNMG120404MR	12,70	12,90	4,76	0,4	5,16	-	4170546	4170043	-
CNMG120408MR	12,70	12,90	4,76	0,8	5,16	4171131	4170547	4170044	4172955
CNMG120412MR	12,70	12,90	4,76	1,2	5,16	4171132	4170548	4170045	-
CNMG160608MR	15,88	16,12	6,35	0,8	6,35	-	4170549	-	-
CNMG160612MR	15,88	16,12	6,35	1,2	6,35	-	4170550	-	-
CNMG160616MR	15,88	16,12	6,35	1,6	6,35	4171136	-	-	-
CNMG190612MR	19,05	19,34	6,35	1,2	7,93	-	4170552	-	4172961
CNMG190616MR	19,05	19,34	6,35	1,6	7,93	-	4170563	-	4172962

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CNMG-MS



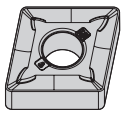


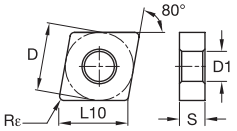
● first choice
○ alternate choice

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H			

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT	WU10HT
CNMG120404MS	12,70	12,90	4,76	0,4	5,16	5908742	5908743	-
CNMG120408MS	12,70	12,90	4,76	0,8	5,16	5908745	5908746	-
CNMG120412MS	12,70	12,90	4,76	1,2	5,16	5908748	5908749	-
CNMG160608MS	15,88	16,12	6,35	0,8	6,35	5908754	5908755	-
CNMG160612MS	15,88	16,12	6,35	1,2	6,35	5908757	5908758	5908759
CNMG190608MS	19,05	19,34	6,35	0,8	7,93	-	5908761	5908762
CNMG190612MS	19,05	19,34	6,35	1,2	7,92	-	5908764	-

CNMG-RH





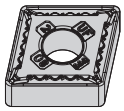
● first choice
○ alternate choice

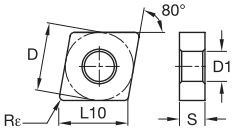
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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT	WK20CT
CNMG120408RH	12,70	12,90	4,76	0,8	5,16	4170979	4171504	5684356	4173035	4171903
CNMG120412RH	12,70	12,90	4,76	1,2	5,16	4170980	4171505	4171698	4173036	4171904
CNMG120416RH	12,70	12,90	4,76	1,6	5,16	4170981	-	4171699	-	4171905
CNMG160608RH	15,88	16,12	6,35	0,8	6,35	4170982	4171507	4171700	4173038	4171906
CNMG160612RH	15,88	16,12	6,35	1,2	6,35	4170983	4171508	4171701	-	4171907
CNMG160616RH	15,88	16,12	6,35	1,6	6,35	4170984	4171509	4171702	-	4171908
CNMG190608RH	19,05	19,34	6,35	0,8	7,93	-	4171510	4171703	4173041	-
CNMG190612RH	19,05	19,34	6,35	1,2	7,93	4170986	4171511	4171704	4173042	4171910
CNMG190616RH	19,05	19,34	6,35	1,6	7,93	-	4171512	4171705	4173043	4171911
CNMG190624RH	19,05	19,34	6,35	2,4	7,93	-	4171523	-	-	-

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CNMG-UF



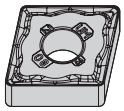


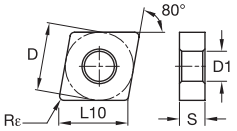
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WM15CT	WS10PT
CNMG120404UF	12,70	12,90	4,76	0,4	5,16	4169353	5645600
CNMG120408UF	12,70	12,90	4,76	0,8	5,16	4169354	5645588

CNMG-UM



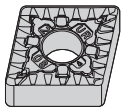


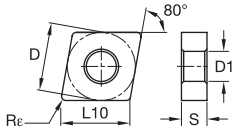
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WP25CT	WM15CT	WM25CT	WM35CT
CNMG120404UM	12,70	12,90	4,76	0,4	5,16	-	-	4172380	-
CNMG120408UM	12,70	12,90	4,76	0,8	5,16	5645219	4172335	4172381	4172411
CNMG120412UM	12,70	12,90	4,76	1,2	5,16	-	-	4172382	-

CNMG-UR





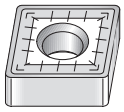
● first choice
○ alternate choice

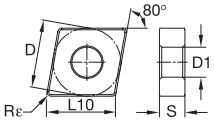
		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK20CT	WS10PT	WS25PT
P		●	●	●	○	○		○	○	○
M					●	●	●		●	●
K		○	○					●	○	○
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ISO catalogue number	D	L10	S	Rε	D1										
CNMG120404UR	12,70	12,90	4,76	0,4	5,16	-	4170500	-	-	4169444	-	-	-	-	-
CNMG120408UR	12,70	12,90	4,76	0,8	5,16	4171093	4170501	4169960	4169407	4169445	4169480	5680085	5301400	5301402	
CNMG120412UR	12,70	12,90	4,76	1,2	5,16	4171094	4170502	4169961	-	4169446	4169481	4171419	5301413	5301416	
CNMG120416UR	12,70	12,90	4,76	1,6	5,16	-	-	-	-	4169447	-	-	-	-	
CNMG160608UR	15,88	16,12	6,35	0,8	6,35	-	4170504	-	-	4169448	-	-	-	-	-
CNMG160612UR	15,88	16,12	6,35	1,2	6,35	-	4170505	-	-	4169449	-	4171422	-	-	
CNMG160616UR	15,88	16,12	6,35	1,6	6,35	4171098	4170506	-	-	4169450	4169485	4171423	-	5578901	
CNMG190612UR	19,05	19,34	6,35	1,2	7,93	-	4170507	4169964	-	4169451	-	-	-	5512536	
CNMG190616UR	19,05	19,34	6,35	1,6	7,93	-	-	-	-	-	4169487	-	-	5579234	

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CNMM-8



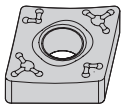


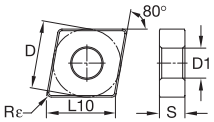
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WP25CT
CNMM1906168	19,05	19,34	6,35	1,6	7,93	5418451

CNMM-65



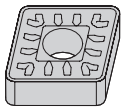


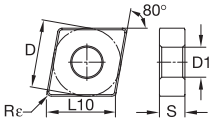
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
CNMM12040865	12,70	12,90	4,76	0,8	5,16	5698348	5698349	5698360	5698347
CNMM12041265	12,70	12,90	4,76	1,2	5,16	5698362	-	-	-
CNMM16061265	15,88	16,12	6,35	1,2	6,35	-	5698370	-	5698368
CNMM19061265	19,05	19,34	6,35	1,2	7,93	-	5491016	5698376	5698374
CNMM19061665	19,05	19,34	6,35	1,6	7,93	5698378	-	-	5698377
CNMM19062465	19,05	19,34	6,35	2,4	7,93	5698410	5698411	-	-

CNMM-SR



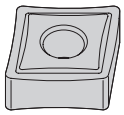


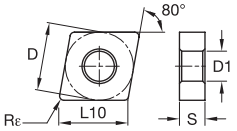
● first choice
○ alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
CNMM190616SR	19,05	19,34	6,35	1,6	7,93	5696643	-	-	5696642
CNMM190624SR	19,05	19,34	6,35	2,4	7,93	-	-	5696644	-
CNMM250924SR	25,40	25,79	9,53	2,4	9,12	5696645	5696646	5696647	-

CNMP



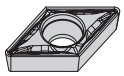


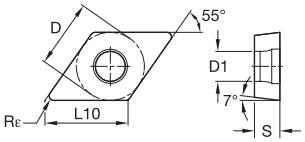
● first choice
○ alternate choice

P	M	K	N	S	H
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○	●	○	○	●	
○	●	○	○	●	

ISO catalogue number	D	L10	S	Rε	D1	WM25CT	WS10PT	WS25PT
CNMP120404	12,70	12,90	4,76	0,4	5,16	4173552	4172439	-
CNMP120408	12,70	12,90	4,76	0,8	5,16	4173653	4172440	4172614

DCMT-FP





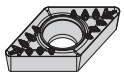
● first choice
○ alternate choice

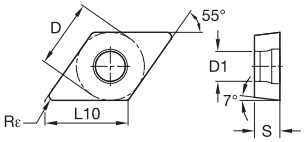
P		●	●	○	○
M				●	●
K		○	○		
N					
S					○
H					

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM15CT	WM25CT
DCMT070202FP	6,35	7,75	2,38	0,2	2,80	-	4170299	-	4168787
DCMT070204FP	6,35	7,75	2,38	0,4	2,80	4169995	4170300	-	4168788
DCMT11T302FP	9,53	11,63	3,97	0,2	4,40	-	4170302	-	4168790
DCMT11T304FP	9,53	11,63	3,97	0,4	4,40	4169997	4170303	4168765	4168791
DCMT11T308FP	9,53	11,63	3,97	0,8	4,40	4169998	4170304	-	4168792
DCMT150404FP	12,70	15,50	4,76	0,4	5,50	-	4170306	-	-
DCMT150408FP	12,70	15,50	4,76	0,8	5,50	4170001	4170307	-	-

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DCMT-MP



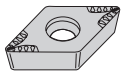


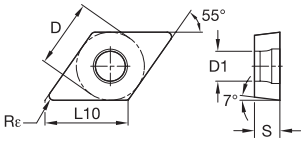
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT
DCMT11T304MP	9,53	11,63	3,97	0,4	4,40	4170201	4170223	-	4170242
DCMT11T308MP	9,53	11,63	3,97	0,8	4,40	4170202	4170224	4168912	4170243
DCMT11T312MP	9,53	11,63	3,97	1,2	4,40	4170213	-	-	-

DCMT-MU



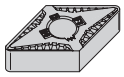


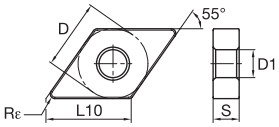
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT	WS10PT	WS25PT
DCMT070204MU	6,35	7,75	2,38	0,4	2,80	6128273	-	-	-	-	-
DCMT070208MU	6,35	7,75	2,38	0,8	2,80	-	6128274	-	-	-	-
DCMT11T304MU	9,53	11,63	3,97	0,4	4,40	5623585	5623583	5623581	5623587	5623582	5623584
DCMT11T308MU	9,52	11,63	3,97	0,8	4,40	5623600	6128278	5623588	5623589	5623601	5623603
DCMT150408MU	12,70	15,50	4,76	0,8	5,50	-	5623608	5623604	-	-	5623610
DCMT150412MU	12,70	15,50	4,76	1,2	5,50	-	6128283	-	-	-	-

DNGG-FS



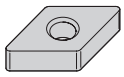


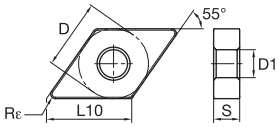
● first choice
○ alternate choice

P	○
M	●
K	○
N	○
S	●
H	

ISO catalogue number	D	L10	S	Rε	D1	WS10PT
DNGG150604FS	12,70	15,50	6,35	0,4	5,16	5548678
DNGG150608FS	12,70	15,50	6,35	0,8	5,16	5548679

DNMA





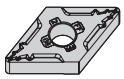
● first choice
○ alternate choice

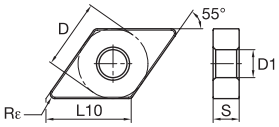
P	○	○
M		
K	●	●
N		
S		
H		

ISO catalogue number	D	L10	S	Rε	D1	WK05CT	WK20CT
DNMA110408	9,53	11,63	4,76	0,8	3,81	-	4171873
DNMA150608	12,70	15,50	6,35	0,8	5,16	4171637	4171878
DNMA150612	12,70	15,50	6,35	1,2	5,16	4171638	4171879
DNMA150616	12,70	15,50	6,35	1,6	5,16	-	4171880

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DNMG-FF



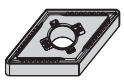


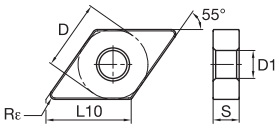
● first choice
○ alternate choice

P	●					
M						
K	○					
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S						
H						

ISO catalogue number	D	L10	S	Rε	D1	WP15CT
DNMG110408FF	9,53	11,63	4,76	0,8	3,81	4171029
DNMG150604FF	12,70	15,50	6,35	0,4	5,16	4171032
DNMG150608FF	12,70	15,50	6,35	0,8	5,16	4171043

DNMG-ML





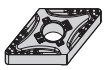
● first choice
○ alternate choice

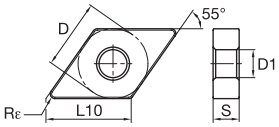
P	●	●	○
M			
K	○	○	●
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H			

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WK20CT
DNMG110404ML	9,53	11,63	4,76	0,4	3,81	4171062	4170461	4171394
DNMG150604ML	12,70	15,50	6,35	0,4	5,16	4171068	4170485	-
DNMG150608ML	12,70	15,50	6,35	0,8	5,16	4171069	4170486	4171400
DNMG150612ML	12,70	15,50	6,35	1,2	5,16	4171070	4170487	-

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DNMG-MR



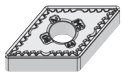


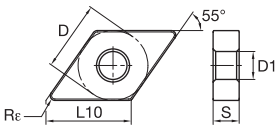
● first choice
○ alternate choice

P	M	K	N	S	H
●	●	○	○	○	○
					●

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT
DNMG150604MR	12,70	15,50	6,35	0,4	5,16	-	4170568	-
DNMG150608MR	12,70	15,50	6,35	0,8	5,16	4171144	4170569	4173023
DNMG150612MR	12,70	15,50	6,35	1,2	5,16	4171145	-	-

DNMG-MS



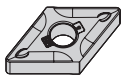


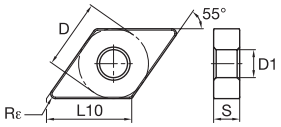
● first choice
○ alternate choice

P	M	K	N	S	H
○	●	○	○	●	
○	●	○	○	●	

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT
DNMG150604MS	12,70	15,50	6,35	0,4	5,16	5908792	5908793
DNMG150608MS	12,70	15,50	6,35	0,8	5,16	5908795	5908796
DNMG150612MS	12,70	15,50	6,35	1,2	5,16	-	5908799

DNMG-RH



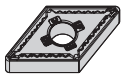


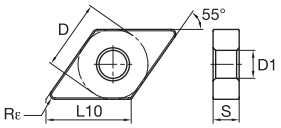
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WK20CT
DNMG150408RH	12,70	15,50	4,76	0,8	5,16	-	4171524	-	-
DNMG150608RH	12,70	15,50	6,35	0,8	5,16	4170991	4171526	4171709	4171914
DNMG150612RH	12,70	15,50	6,35	1,2	5,16	4170992	4171527	4171710	4171915
DNMG150616RH	12,70	15,50	6,35	1,6	5,16	-	-	-	4171916

DNMG-UF





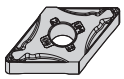
● first choice
○ alternate choice

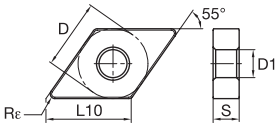
P		○	○	○					
M		●	●	●					
K				○					
N				○					
S				○	●				
H									

ISO catalogue number	D	L10	S	Rε	D1	WM15CT	WM25CT	WS10PT
DNMG110404UF	9,53	11,63	4,76	0,4	3,81	-	-	5645603
DNMG150604UF	12,70	15,50	6,35	0,4	5,16	4169361	4169387	-
DNMG150608UF	12,70	15,50	6,35	0,8	5,16	4169362	-	-

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DNMG-UM



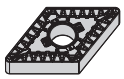


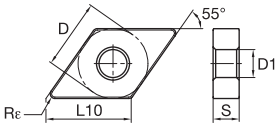
● first choice
○ alternate choice

P	○
M	●
K	
N	
S	○
H	

ISO catalogue number	D	L10	S	Rε	D1	WM25CT
DNMG110404UM	9,53	11,63	4,76	0,4	3,81	4172383
DNMG110408UM	9,53	11,63	4,76	0,8	3,81	4172384
DNMG150604UM	12,70	15,50	6,35	0,4	5,16	4172389
DNMG150608UM	12,70	15,50	6,35	0,8	5,16	4172390

DNMG-UR



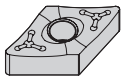


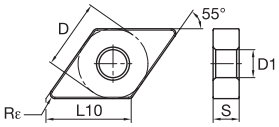
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS25PT
DNMG110408UR	9,53	11,63	4,76	0,8	3,81	-	4170509	-	-	-	4169488	-	-	-
DNMG150608UR	12,70	15,50	6,35	0,8	5,16	4171105	4170513	4169969	4169427	4169456	4169492	-	4171431	5579276
DNMG150612UR	12,70	15,50	6,35	1,2	5,16	4171106	4170514	-	-	-	-	5680172	4171432	-
DNMG150616UR	12,70	15,50	6,35	1,6	5,16	-	-	-	-	-	4169494	-	-	-

DNMM-65



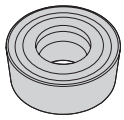


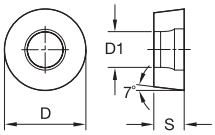
● first choice
○ alternate choice

P	●	●	●
M			○
K	○	○	
N			
S			
H			

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT
DNMM15060865	12,70	15,50	6,35	0,8	5,16	5698413	5698414	5698415
DNMM15061265	12,70	15,50	6,35	1,2	5,16	-	5494773	-

RCMT





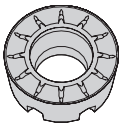
● first choice
○ alternate choice

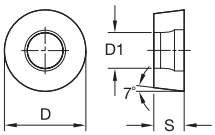
P	●	●	●	○
M			○	
K	○	○		●
N				
S				
H				

ISO catalogue number	D	S	D1	WP15CT	WP25CT	WP35CT	WK20CT
RCMT0602M0	6,00	2,38	2,80	4169975	4170536	-	4170478
RCMT0803M0	8,00	3,18	3,40	4169976	4170537	-	4170479
RCMT10T3M0	10,00	3,97	4,40	4169977	4170538	4170752	4170480
RCMT1204M0	12,00	4,76	4,40	4169978	4170539	4170803	4170481
RCMT1606M0	16,00	6,35	5,50	4169979	-	4170804	4170482

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RCMT-43

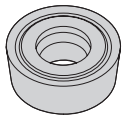


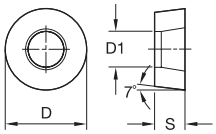


● first choice
○ alternate choice

ISO catalogue number	D	S	D1	WP35CT
RCMT0803M043	8,00	3,18	3,40	6128303
RCMT1204M043	12,00	4,76	4,40	6128304

RCMX

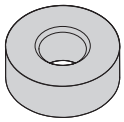


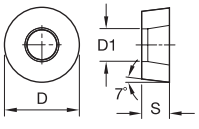


● first choice
○ alternate choice

ISO catalogue number	D	S	D1	WP15CT	WP25CT	WP35CT	WK20CT
RCMX2006M0T	20,00	6,35	6,50	4169980	4170541	4170805	4170543

RNMA

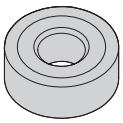


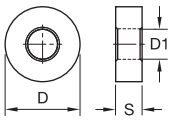


● first choice
○ alternate choice

ISO catalogue number	D	S	D1	WK20CT
RNMA120400	12,70	4,76	5,16	4171881

RNMG-RH



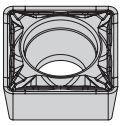


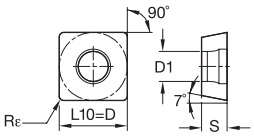
● first choice
○ alternate choice

P	●
M	
K	○
N	
S	
H	

ISO catalogue number	D	S	D1	WP15CT
RNMG120400RH	12,70	4,76	5,16	4170996

SCMT-FP





● first choice
○ alternate choice

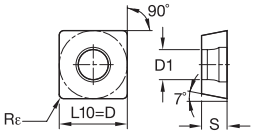
P	●
M	
K	○
N	
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ISO catalogue number	D	L10	S	Rε	D1	WP25CT
SCMT09T308FP	9,53	9,53	3,97	0,8	4,40	4170309
SCMT120408FP	12,70	12,70	4,76	0,8	5,50	4170311

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SCMT-MP



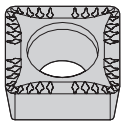


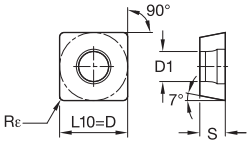
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT
SCMT09T304MP	9,53	9,53	3,97	0,4	4,40	-	4170226	-	-
SCMT09T308MP	9,53	9,53	3,97	0,8	4,40	-	4170227	-	4170245
SCMT120408MP	12,70	12,70	4,76	0,8	5,50	4170215	4170229	-	4170247
SCMT120412MP	12,70	12,70	4,76	1,2	5,50	-	4170230	4168917	-

SCMT-MU



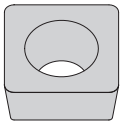


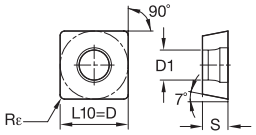
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP25CT	WP35CT	WM25CT	WK20CT	WS10PT
SCMT09T304MU	9,53	9,53	3,97	0,4	4,40	-	-	5623447	-	-
SCMT09T308MU	9,53	9,53	3,97	0,8	4,40	5623464	5623462	5623448	5623449	5623460
SCMT120408MU	12,70	12,70	4,76	0,8	5,50	6127255	-	-	-	-

SCMW



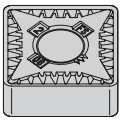


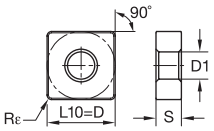
● first choice
○ alternate choice

P	○
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K	●
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ISO catalogue number	D	L10	S	Rε	D1	WK20CT
SCMW120408	12,70	12,70	4,76	0,8	5,50	4170380

SNGG-FS





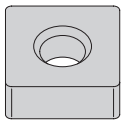
● first choice
○ alternate choice

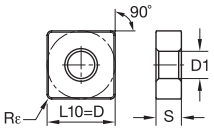
P	○
M	●
K	
N	○
S	●
H	

ISO catalogue number	D	L10	S	Rε	D1	WU10HT
SNGG120408FS	12,70	12,70	4,76	0,8	5,16	5549997

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SNMA



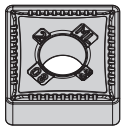


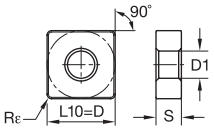
● first choice
○ alternate choice

P	○ ○
M	
K	● ●
N	
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	WK05CT	WK20CT
SNMA120408	12,70	12,70	4,76	0,8	5,16	-	4171882
SNMA120412	12,70	12,70	4,76	1,2	5,16	4171641	4171883
SNMA150608	15,88	15,88	6,35	0,8	6,35	-	4171885
SNMA190616	19,05	19,05	6,35	1,6	7,93	-	4171889

SNMG-ML



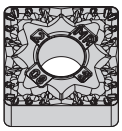


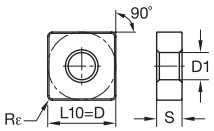
● first choice
○ alternate choice

P	● ● ○
M	
K	○ ○ ●
N	
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WK20CT
SNMG120404ML	12,70	12,70	4,76	0,4	5,16	-	-	4171403
SNMG120408ML	12,70	12,70	4,76	0,8	5,16	-	4170489	4171404
SNMG120412ML	12,70	12,70	4,76	1,2	5,16	4171074	4170490	-

SNMG-MR



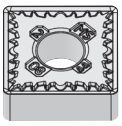


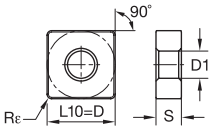
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
SNMG120408MR	12,70	12,70	4,76	0,8	5,16	4171146	4170571	4170057	-
SNMG120412MR	12,70	12,70	4,76	1,2	5,16	-	5684355	-	-
SNMG150612MR	15,88	15,88	6,35	1,2	6,35	4171147	-	-	4173029
SNMG190612MR	19,05	19,05	6,35	1,2	7,93	-	4170572	-	-

SNMG-MS





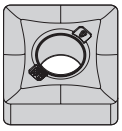
● first choice
○ alternate choice

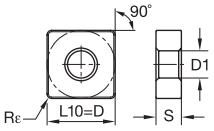
P	○	○
M	●	●
K	○	○
N	○	○
S	●	●
H		

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT
SNMG120408MS	12,70	12,70	4,76	0,8	5,16	5908847	5908848
SNMG120412MS	12,70	12,70	4,76	1,2	5,16	5908850	-

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SNMG-RH



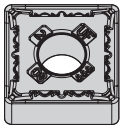


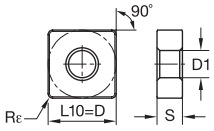
● first choice
○ alternate choice

P	●	○
M		●
K	○	●
N		
S		○
H		

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT	WK20CT
SNMG120408RH	12,70	12,70	4,76	0,8	5,16	4170998	4171533	4171715	-	4171918
SNMG120412RH	12,70	12,70	4,76	1,2	5,16	4170999	4171534	4171716	-	4171919
SNMG120416RH	12,70	12,70	4,76	1,6	5,16	-	4171535	-	-	-
SNMG150608RH	15,88	15,88	6,35	0,8	6,35	4171001	4171536	-	-	4171921
SNMG150612RH	15,88	15,88	6,35	1,2	6,35	4171002	4171537	-	-	4171922
SNMG150616RH	15,88	15,88	6,35	1,6	6,35	4171003	4171538	4171720	-	4171923
SNMG190612RH	19,05	19,05	6,35	1,2	7,93	4171005	4171540	4171722	4173056	4171925
SNMG190616RH	19,05	19,05	6,35	1,6	7,93	-	-	-	-	4171926

SNMG-UF



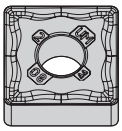


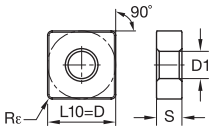
● first choice
○ alternate choice

P		○
M		●
K		○
N		○
S		●
H		

ISO catalogue number	D	L10	S	Rε	D1	WS10PT
SNMG120404UF	12,70	12,70	4,76	0,4	5,16	5645610

SNMG-UM



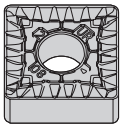


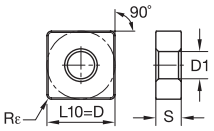
● first choice
○ alternate choice

P		○	○				
M		●	●				
K							
N							
S		○					
H							

ISO catalogue number	D	L10	S	Rε	D1	WM25CT	WM35CT
SNMG120404UM	12,70	12,70	4,76	0,4	5,16	4172393	-
SNMG120408UM	12,70	12,70	4,76	0,8	5,16	4172394	4172424
SNMG120412UM	12,70	12,70	4,76	1,2	5,16	4172395	4172425

SNMG-UR





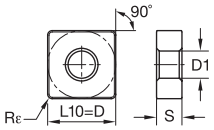
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT	WM35CT	WK20CT	WS25PT
SNMG120408UR	12,70	12,70	4,76	0,8	5,16	4171108	4170516	4169989	4169458	-	4171434	-
SNMG120412UR	12,70	12,70	4,76	1,2	5,16	4171109	4170517	4169990	4169459	-	-	-
SNMG120416UR	12,70	12,70	4,76	1,6	5,16	-	-	-	4169460	-	-	5680173
SNMG150612UR	15,88	15,88	6,35	1,2	6,35	-	4170518	4169991	4169461	-	4171437	-
SNMG150616UR	15,88	15,88	6,35	1,6	6,35	-	4170519	-	-	-	-	-
SNMG190612UR	19,05	19,05	6,35	1,2	7,93	-	4170520	-	-	4169500	-	-
SNMG190616UR	19,05	19,05	6,35	1,6	7,93	-	-	-	4169464	-	-	-

SNMM-8



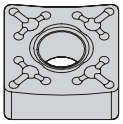


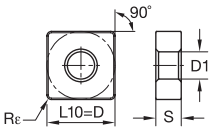
● first choice
○ alternate choice

P	●
M	
K	○
N	
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT
SNMM1906168	19,05	19,05	6,35	1,6	7,93	-	6128309	-
SNMM2507248	25,40	25,40	7,94	2,4	9,12	5429112	5429111	5370813

SNMM-65





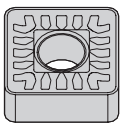
● first choice
○ alternate choice

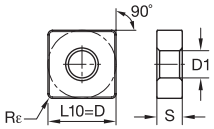
P	●
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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
SNMM12040865	12,70	12,70	4,76	0,8	5,16	-	5696554	5696555	5696553
SNMM12041265	12,70	12,70	4,76	1,2	5,16	-	5696557	-	-
SNMM19061665	19,05	19,05	6,35	1,6	7,93	5696615	-	-	-

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SNMM-SR



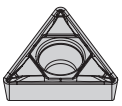


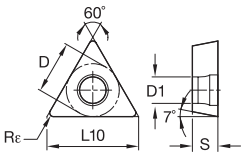
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
SNMM190616SR	19,05	19,05	6,35	1,6	7,93	5478876	5478877	-	5696648
SNMM250724SR	25,40	25,40	7,94	2,4	9,12	-	5429119	5946214	-
SNMM250924SR	25,40	25,40	9,53	2,4	9,12	5382277	5382390	5373074	5402173

TCMT-FP





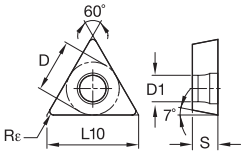
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT
TCMT110202FP	6,35	11,00	2,38	0,2	2,90	-	-	4168800	-
TCMT110204FP	6,35	11,00	2,38	0,4	2,80	4170006	4170313	4168801	-
TCMT16T304FP	9,53	16,50	3,97	0,4	4,40	4170008	4170315	-	-
TCMT16T308FP	9,53	16,50	3,97	0,8	4,40	-	4170316	-	4170100

TCMT-MP



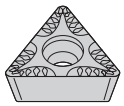


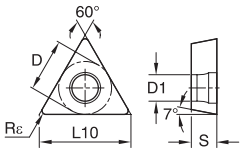
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT
TCMT16T304MP	9,53	16,50	3,97	0,4	4,40	-	4170232	-	-
TCMT16T308MP	9,53	16,50	3,97	0,8	4,40	4170216	4170233	4168919	4170251
TCMT16T312MP	9,53	16,50	3,97	1,2	4,40	-	-	-	4170252

TCMT-MU





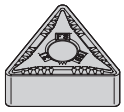
● first choice
○ alternate choice

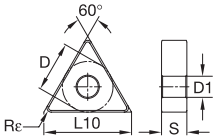
P		●	●	●	○	○	○	○			
M				○	●		●	●			
K		○	○			●	○	○			
N							○	○			
S					○		●	●			
H											

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT	WK20CT	WS10PT	WS25PT
TCMT16T304MU	9,53	16,50	3,97	0,4	4,40	5623614	5623615	-	5623613	5623616	-	5623617
TCMT16T308MU	9,53	16,50	3,97	0,8	4,40	5623621	5623620	-	5623619	5623618	5623622	-
TCMT220412MU	12,70	22,00	4,76	1,2	5,50	-	-	6128327	-	-	-	-

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TNGG-FS



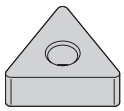


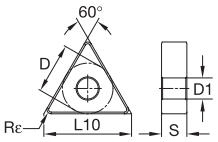
● first choice
○ alternate choice

P	○
M	●
K	○
N	○
S	●
H	

ISO catalogue number	D	L10	S	Rε	D1	WS25PT
TNGG160404FS	9,53	16,50	4,76	0,4	3,81	5538231

TNMA





● first choice
○ alternate choice

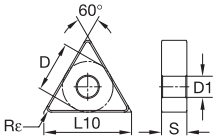
P	○
M	
K	●
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H	

ISO catalogue number	D	L10	S	Rε	D1	WK20CT
TNMA160408	9,53	16,50	4,76	0,8	3,81	4171890
TNMA160412	9,53	16,50	4,76	1,2	3,81	4171891
TNMA220412	12,70	22,00	4,76	1,2	5,16	4171894
TNMA220416	12,70	22,00	4,76	1,6	5,16	4171895

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TNMG-ML



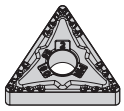


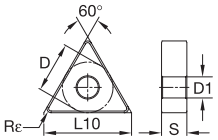
● first choice
○ alternate choice

P	●	●	○
M			
K	○	○	●
N			
S			
H			

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WK20CT
TNMG160404ML	9,53	16,50	4,76	0,4	3,81	4171075	4170491	-
TNMG160408ML	9,53	16,50	4,76	0,8	3,81	4171076	4170492	4171410
TNMG160412ML	9,53	16,50	4,76	1,2	3,81	4171077	-	-

TNMG-MR



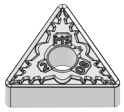


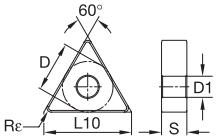
● first choice
○ alternate choice

P	●	●
M		
K	○	○
N		
S		
H		

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT
TNMG160404MR	9,53	16,50	4,76	0,4	3,81	4171150	4170573
TNMG160408MR	9,53	16,50	4,76	0,8	3,81	4171151	4170574
TNMG160412MR	9,53	16,50	4,76	1,2	3,81	4171152	-

TNMG-MS





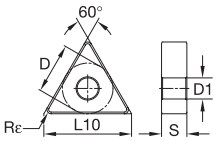
● first choice
○ alternate choice

P	○	○
M	●	●
K	○	○
N	○	○
S	●	●
H		

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT
TNMG160404MS	9,53	16,50	4,76	0,4	3,81	5908927	5908928
TNMG160408MS	9,53	16,50	4,76	0,8	3,81	5908930	5908931

TNMG-RH



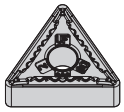


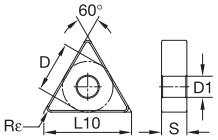
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WK20CT
TNMG160408RH	9,53	16,50	4,76	0,8	3,81	4171007	4171542	-	4171927
TNMG160412RH	9,53	16,50	4,76	1,2	3,81	-	-	4171725	-
TNMG220408RH	12,70	22,00	4,76	0,8	5,16	-	4171544	-	-

TNMG-UF



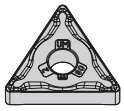


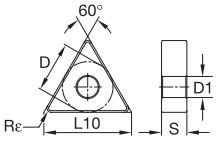
● first choice
○ alternate choice

P	○
M	●
K	○
N	○
S	●
H	

ISO catalogue number	D	L10	S	Rε	D1	WS10PT
TNMG160404UF	9,53	16,50	4,76	0,4	3,81	5432605

TNMG-UM





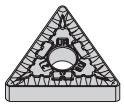
● first choice
○ alternate choice

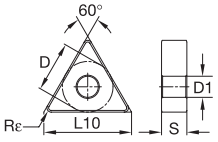
P	○	○
M	●	●
K		○
N		○
S	○	●
H		

ISO catalogue number	D	L10	S	Rε	D1	WM25CT	WS10PT
TNMG160404UM	9,53	16,50	4,76	0,4	3,81	-	5550226
TNMG160408UM	9,53	16,50	4,76	0,8	3,81	4172397	-

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TNMG-UR



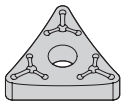


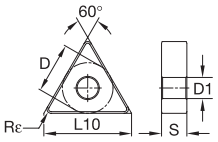
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM25CT	WK20CT	WS25PT
TNMG160408UR	9,53	16,50	4,76	0,8	3,81	4171115	4170522	4169465	4171441	5579395
TNMG160412UR	9,53	16,50	4,76	1,2	3,81	-	4170523	4169466	-	5680175
TNMG160416UR	9,53	16,50	4,76	1,6	3,81	4171117	-	-	4171443	-

TNMM-65





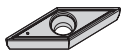
● first choice
○ alternate choice

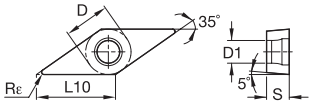
P		●	●	●
M				○
K		○	○	
N				
S				
H				

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT
TNMM16040865	9,53	16,50	4,76	0,8	3,81	-	-	5696619
TNMM22040865	12,70	22,00	4,76	0,8	5,16	5696621	5696622	5696623

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VBMT



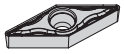


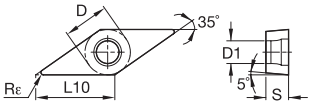
● first choice
○ alternate choice

P	● ● ●
M	○
K	○ ○
N	
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT
VBMT160404	9,53	16,61	4,76	0,4	4,40	4169983	4170553	4170807
VBMT160408	9,53	16,61	4,76	0,8	4,40	4169984	4170554	4170808

VBMT-FP





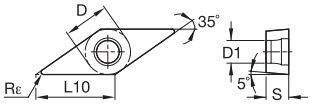
● first choice
○ alternate choice

P	● ● ○ ○ ○
M	● ●
K	○ ○ ●
N	
S	○
H	

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WM15CT	WM25CT	WK20CT
VBMT110304FP	6,35	11,07	3,18	0,4	2,80	-	4170319	-	4168807	-
VBMT160402FP	9,53	16,61	4,76	0,2	4,40	-	4170321	-	4168809	-
VBMT160404FP	9,53	16,61	4,76	0,4	4,40	4170013	4170322	4168776	4168810	4170103
VBMT160408FP	9,53	16,61	4,76	0,8	4,40	4170014	4170323	-	4168811	-

VBMT-MP



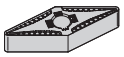


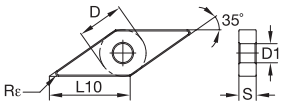
● first choice
○ alternate choice

P	M	K	N	S	H
●	●	○		○	
○					
○		●			

ISO catalogue number	D	L10	S	Rε	D1	WP25CT	WM25CT	WK20CT
VBMT160404MP	9,53	16,61	4,76	0,4	4,40	4170235	4168921	-
VBMT160408MP	9,53	16,61	4,76	0,8	4,40	4170236	4168922	4170254

VNGG-FS



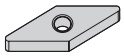


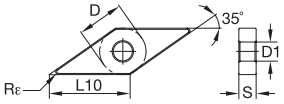
● first choice
○ alternate choice

P	M	K	N	S	H
○	●	○	○	●	

ISO catalogue number	D	L10	S	Rε	D1	WS10PT
VNGG160401FS	9,53	16,61	4,76	0,1	3,81	5548684
VNGG160402FS	9,53	16,61	4,76	0,2	3,81	5548683

VNMA





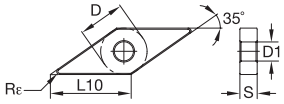
● first choice
○ alternate choice

P	M	K	N	S	H
○		●			

ISO catalogue number	D	L10	S	Rε	D1	WK20CT
VNMA160408	9,53	16,61	4,76	0,8	3,81	4171897

VNMG-ML





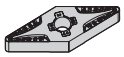
● first choice
○ alternate choice

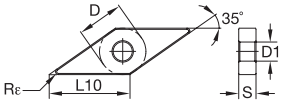
P	M	K	N	S	H
●		○			
●		○			
○		●			

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WK20CT
VNMG160404ML	9,53	16,61	4,76	0,4	3,81	4171079	4170495	-
VNMG160408ML	9,53	16,61	4,76	0,8	3,81	-	4170496	4171414

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VNMG-MR



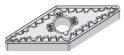


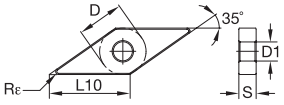
● first choice
○ alternate choice

P	● ●
M	
K	○ ○
N	
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT
VNMG160408MR	9,53	16,61	4,76	0,8	3,81	4171157	4170580

VNMG-MS





● first choice
○ alternate choice

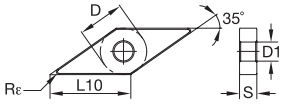
P	○ ○
M	● ●
K	○ ○
N	○ ○
S	● ●
H	

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT
VNMG160404MS	9,53	16,61	4,76	0,4	3,81	5908944	5908945
VNMG160408MS	9,53	16,61	4,76	0,8	3,81	5908947	5908948

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VNMG-UF



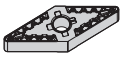


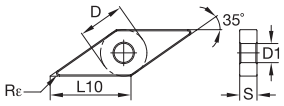
● first choice
○ alternate choice

P	○	○
M	●	●
K		○
N		○
S		●
H		

ISO catalogue number	D	L10	S	Rε	D1	WM15CT	WS10PT
VNMG160404UF	9,53	16,61	4,76	0,4	3,81	4169372	5645616

VNMG-UR



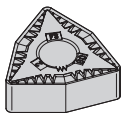


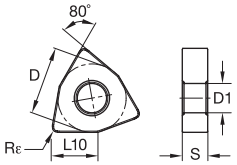
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP25CT	WM25CT	WK20CT	WS10PT
VNMG160408UR	9,53	16,61	4,76	0,8	3,81	4170529	4169473	4171449	-
VNMG160412UR	9,53	16,61	4,76	1,2	3,81	4170530	4169474	4171450	5680176

WNGG-FS



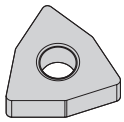


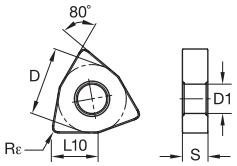
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT	WU10HT
WNGG080404FS	12,70	8,69	4,76	0,4	5,16	-	5538234	-
WNGG080408FS	12,70	8,69	4,76	0,8	5,16	5548688	-	5550004

WNMA





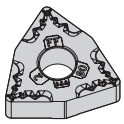
● first choice
○ alternate choice

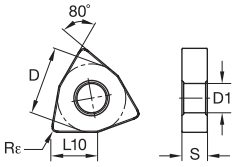
P	M	K	N	S	H
○		●			
○		●			

ISO catalogue number	D	L10	S	Rε	D1	WK05CT	WK20CT
WNMA080408	12,70	8,69	4,76	0,8	5,16	4171654	4171900
WNMA080412	12,70	8,69	4,76	1,2	5,16	4171655	4171901

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WNMG-FF





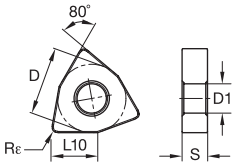
● first choice
○ alternate choice

P	●
M	
K	○
N	
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	WP15CT
WNMG080404FF	12,70	8,69	4,76	0,4	5,16	4171057

WNMG-ML



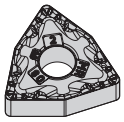


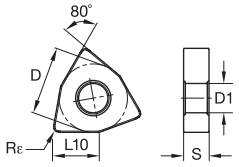
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WK05CT	WK20CT
WNMG080404ML	12,70	8,69	4,76	0,4	5,16	4171083	4170498	4171678	4171417
WNMG080408ML	12,70	8,69	4,76	0,8	5,16	4171084	4170499	4171679	4171418

WNMG-MR



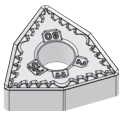


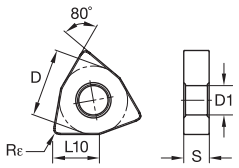
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT
WNMG080408MR	12,70	8,69	4,76	0,8	5,16	4171158	4170581	4170067	4173033
WNMG080412MR	12,70	8,69	4,76	1,2	5,16	-	4170582	4170068	-

WNMG-MS





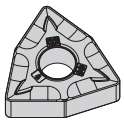
● first choice
○ alternate choice

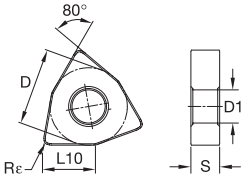
P	○	○	○
M	●	●	●
K	○	○	
N	○	○	○
S	●	●	●
H			

ISO catalogue number	D	L10	S	Rε	D1	WS10PT	WS25PT	WU10HT
WNMG060408MS	9,53	6,52	4,76	0,8	3,81	-	5908967	-
WNMG080404MS	12,70	8,69	4,76	0,4	5,16	5908969	5908970	-
WNMG080408MS	12,70	8,69	4,76	0,8	5,16	5908972	5908973	5908974

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WNMG-RH





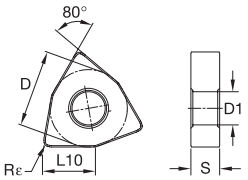
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM25CT	WK20CT
WNMG080408RH	12,70	8,69	4,76	0,8	5,16	4171019	4171554	4171736	4173064	4171932
WNMG080412RH	12,70	8,69	4,76	1,2	5,16	4171020	4171555	4171737	4173065	4171933
WNMG080416RH	12,70	8,69	4,76	1,6	5,16	-	4171556	-	-	-

WNMG-UF



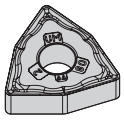


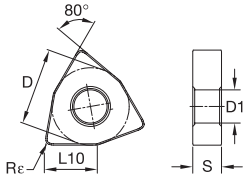
● first choice
○ alternate choice

P		○	○
M		●	●
K			○
N			○
S			●
H			

ISO catalogue number	D	L10	S	Rε	D1	WM15CT	WS10PT
WNMG080404UF	12,70	8,69	4,76	0,4	5,16	-	5645619
WNMG080408UF	12,70	8,69	4,76	0,8	5,16	-	5645623
WNMG080412UF	12,70	8,69	4,76	1,2	5,16	4169378	-

WNMG-UM



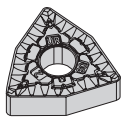


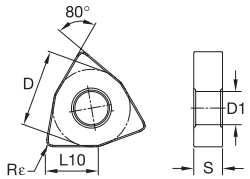
● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WM15CT	WM25CT	WM35CT	WS10PT
WNMG060404UM	9,53	6,52	4,76	0,4	3,81	-	4172403	-	-
WNMG080404UM	12,70	8,69	4,76	0,4	5,16	4172377	4172406	4172435	-
WNMG080408UM	12,70	8,69	4,76	0,8	5,16	4172378	4172407	4172436	-
WNMG080412UM	12,70	8,69	4,76	1,2	5,16	-	4172408	-	5645269

WNMG-UR





● first choice
○ alternate choice

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

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK20CT	WS10PT
WNMG060408UR	9,53	6,52	4,76	0,8	3,81	-	-	-	-	4169475	-	-	-
WNMG080408UR	12,70	8,69	4,76	0,8	5,16	4171127	4170533	4170040	4169442	4169476	4169509	4171453	-
WNMG080412UR	12,70	8,69	4,76	1,2	5,16	4171128	4170534	4170041	-	4169477	4169510	4171454	5579420

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Speed and Feed Chart • Positive Inserts • Metric

DIN ISO 513	VDI 3323	A Finishing (ap x f = 1 x 0,10)			B Medium (ap x f = 2 x 0,20)						C Roughing (ap x f = 4 x 0,25)					
Material Group		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	Geometry ap [mm] f [mm]	FP 0,2–2,0 0,05–0,20			FP • MP 0,3–4,5 0,08–0,35			FP • MP 0,3–4,5 0,08–0,35			MP 0,7–5,0 0,12–0,40			MP 0,7–5,0 0,12–0,40		
		WP15CT			WP15CT			WP15CT / WP25CT			WP25CT			WP35CT		
	1	340	**490**	590	280	**400**	480	250	**360**	430	200	**290**	350	180	**260**	310
	2	340	**480**	580	260	**370**	440	240	**340**	410	190	**270**	320	130	**190**	230
	3	290	**420**	500	180	**260**	310	170	**240**	290	160	**230**	280	130	**180**	220
	4	260	**370**	440	190	**270**	320	180	**250**	300	130	**190**	230	110	**150**	180
	5	200	**280**	340	140	**200**	240	130	**190**	230	90	**130**	160	75	**110**	130
	6	270	**390**	470	200	**290**	350	190	**270**	320	140	**200**	240	110	**160**	190
	7	260	**370**	440	190	**270**	320	180	**250**	300	130	**190**	230	110	**150**	180
	8	220	**320**	380	160	**230**	280	150	**210**	250	110	**150**	180	85	**120**	140
	9	200	**280**	340	140	**200**	240	130	**190**	230	90	**130**	160	75	**110**	130
	10	270	**390**	470	200	**290**	350	190	**270**	320	140	**200**	240	110	**160**	190
	11	200	**280**	340	130	**190**	230	120	**170**	200	90	**130**	160	75	**110**	130
	12	150	**220**	260	140	**200**	240	130	**180**	220	120	**170**	200	110	**160**	190
	13.1	130	**190**	230	120	**170**	200	110	**150**	180	100	**140**	170	90	**130**	160
	13.2	65	**95**	115	60	**85**	100	55	**75**	90	50	**70**	85	45	**65**	80
M	Geometry ap [mm] f [mm]	FP 0,2–2,0 0,05–0,20			FP • MP 0,3–4,5 0,08–0,35			FP • MP 0,3–4,5 0,08–0,35			MP 0,3–4,5 0,08–0,35			MP 0,3–4,5 0,08–0,35		
		WM15CT			WM15CT			WM25CT			WM25CT			WM35CT		
	14.1	180	**250**	300	150	**220**	260	140	**190**	230	140	**200**	240	110	**150**	180
	14.2	140	**200**	240	130	**180**	220	110	**160**	190	110	**160**	190	85	**120**	140
	14.3	110	**150**	180	100	**140**	170	85	**120**	140	85	**120**	140	65	**90**	110
	14.4	90	**130**	160	75	**110**	130	70	**95**	110	70	**100**	120	55	**80**	95
K	Geometry ap [mm] f [mm]	FP 0,2–2,0 0,05–0,20			FP • MP • .CMW 0,3–4,5 0,08–0,35			FP • MP • .CMW 0,3–4,5 0,08–0,35			MP • .CMW 1,0–8,0 0,1–0,5			MP • .CMW 1,0–8,0 0,1–0,5		
		WK05CT / WK20CT			WK05CT / WK20CT						WK20CT					
	15	290	**410**	490	230	**330**	400	–	**–**	–	180	**260**	310	–	**–**	–
	16	230	**330**	400	180	**250**	300	–	**–**	–	140	**200**	240	–	**–**	–
	17	250	**360**	430	210	**300**	360	–	**–**	–	180	**250**	300	–	**–**	–
	18	240	**340**	410	190	**270**	320	–	**–**	–	150	**210**	250	–	**–**	–
	19	340	**490**	590	290	**410**	490	–	**–**	–	240	**340**	410	–	**–**	–
	20	290	**410**	490	230	**330**	400	–	**–**	–	180	**260**	310	–	**–**	–

Speed and Feed Chart • Negative Inserts • Metric

DIN ISO 513	VDI 3323	A Finishing (doc x feed = 1,00 x 0,10)			B Medium (doc x feed = 2,00 x 0,20)			C Roughing (doc x feed = 4,00 x 0,25)			D Heavy roughing (doc x feed = 6,00 x 0,60)								
Material Group		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	Geometry	FF • ML			ML • UR • MR			ML • UR • MR			UR • MR • RH			UR • MR • RH			RH			RH		
	DOC [mm]	0,20 – 2,00			0,80 – 5,00			0,80 – 5,00			1,00 – 8,00			1,00 – 8,00			2,00 – 15,00			2,00 – 15,00		
	f [mm]	0,05 – 0,20			0,16 – 0,40			0,16 – 0,40			0,20 – 0,60			0,20 – 0,60			0,40 – 1,00			0,40 – 1,00		
		WP15CT			WP15CT			WP25CT			WP15CT			WP25CT			WP25CT			WP35CT		
	1	340	**490**	590	280	**400**	480	250	**360**	430	200	**290**	350	180	**260**	310	150	**220**	260	150	**210**	250
	2	340	**480**	580	260	**370**	440	240	**340**	415	190	**270**	320	130	**190**	230	110	**160**	190	110	**150**	180
	3	290	**420**	500	180	**260**	310	170	**240**	290	160	**230**	280	130	**180**	220	110	**150**	180	100	**140**	170
	4	260	**370**	440	190	**270**	320	180	**250**	300	130	**190**	230	110	**150**	180	90	**130**	160	70	**100**	120
	5	200	**280**	340	140	**200**	240	130	**190**	230	90	**130**	160	75	**110**	130	65	**90**	110	55	**80**	95
	6	270	**390**	470	200	**290**	350	190	**270**	320	140	**200**	240	110	**160**	190	90	**130**	160	75	**110**	130
	7	260	**370**	440	190	**270**	320	180	**250**	300	130	**190**	230	110	**150**	180	85	**120**	140	70	**100**	120
	8	220	**320**	380	160	**230**	280	150	**210**	250	110	**150**	180	85	**120**	140	70	**100**	120	65	**90**	110
	9	200	**280**	340	140	**200**	240	130	**190**	230	90	**130**	160	75	**110**	130	65	**90**	110	55	**80**	95
	10	270	**390**	470	200	**290**	350	190	**270**	320	140	**200**	240	110	**160**	190	90	**130**	160	75	**110**	130
	11	200	**280**	340	130	**190**	230	120	**170**	200	90	**130**	160	75	**110**	130	65	**90**	110	55	**80**	95
	12	150	**220**	260	140	**200**	240	130	**180**	220	120	**170**	200	110	**160**	190	110	**150**	180	100	**140**	170
	13.1	130	**190**	230	120	**170**	200	110	**150**	180	100	**140**	170	90	**130**	160	85	**120**	140	75	**110**	130
	13.2	65	**95**	115	60	**85**	100	55	**75**	90	50	**70**	85	45	**65**	80	45	**60**	70	40	**55**	65
M	Geometry	FF • UF • UM			FF • UM • .NMP			FF • UM • .NMP			UM • .NMP • UR • RH			UM • .NMP • UR • RH			RH					
	DOC [mm]	0,20 – 2,00			0,60 – 5,00			0,60 – 5,00			0,50 – 6,00			0,50 – 6,00			4,00 – 15,00					
	f [mm]	0,05 – 0,20			0,12 – 0,40			0,12 – 0,40			0,10 – 0,60			0,10 – 0,60			0,40 – 1,00					
		WM15CT			WM15CT			WM25CT			WM25CT			WM35CT			WM35CT					
	14.1	180	**250**	300	150	**220**	260	140	**190**	230	140	**200**	240	110	**150**	180	110	**150**	180	–	**–**	–
	14.2	140	**200**	240	130	**180**	220	110	**160**	190	110	**160**	190	85	**120**	140	85	**120**	140	–	**–**	–
	14.3	110	**150**	180	100	**140**	170	85	**120**	140	85	**120**	140	65	**90**	110	65	**90**	110	–	**–**	–
	14.4	90	**130**	160	75	**110**	130	70	**95**	110	70	**100**	120	55	**80**	95	60	**80**	95	–	**–**	–
K	Geometry	FF			.NMA • ML						UR • .NMA • RH						UR • RH • .NMA					
	DOC [mm]	0,10 – 2,67			1,00 – 8,00						1,00 – 8,00						2,00 – 15,00					
	f [mm]	0,05 – 0,15			0,20 – 0,60						0,12 – 0,60						0,25 – 1,20					
		WK05CT / WK20CT			WK05CT / WK20CT						WK05CT / WK20CT						WK05CT / WK20CT					
	15	290	**415**	490	230	**330**	400	–	**–**	–	180	**260**	310	–	**–**	–	160	**230**	280	–	**–**	–
	16	230	**330**	400	180	**250**	300	–	**–**	–	140	**200**	240	–	**–**	–	120	**170**	200	–	**–**	–
	17	250	**360**	430	210	**300**	360	–	**–**	–	180	**250**	300	–	**–**	–	150	**220**	260	–	**–**	–
	18	240	**340**	415	190	**270**	320	–	**–**	–	150	**210**	250	–	**–**	–	130	**180**	220	–	**–**	–
	19	340	**490**	590	290	**415**	490	–	**–**	–	240	**340**	415	–	**–**	–	220	**310**	370	–	**–**	–
	20	290	**415**	490	230	**330**	400	–	**–**	–	180	**260**	310	–	**–**	–	160	**230**	280	–	**–**	–
S	Geometry	.NMP			.NMP • UM						.NMP • UR											
	DOC [mm]	0,50 – 1,00			0,50 – 1,00						0,50 – 6,00											
	f [mm]	0,10 – 0,50			0,10 – 0,50						0,10 – 0,60											
		WS10PT / WS25PT			WS10PT / WS25PT / WM25CT						WM25CT											
	21	55	**80**	95	50	**65**	80	–	**–**	–	45	**60**	70	–	**–**	–	–	**–**	–	–	**–**	–
	22	50	**65**	80	35	**50**	60	–	**–**	–	35	**50**	60	–	**–**	–	–	**–**	–	–	**–**	–
	23	35	**50**	60	30	**40**	50	–	**–**	–	25	**40**	45	–	**–**	–	–	**–**	–	–	**–**	–
	24	20	**30**	40	20	**25**	30	–	**–**	–	20	**25**	30	–	**–**	–	–	**–**	–	–	**–**	–
	25	25	**35**	40	20	**25**	30	–	**–**	–	20	**25**	30	–	**–**	–	–	**–**	–	–	**–**	–
	26	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–	–	**–**	–
	27	45	**60**	70	35	**50**	60	–	**–**	–	35	**45**	55	–	**–**	–	–	**–**	–	–	**–**	–

Material Capabilities and Components Machined with Victory™ Grades

P Steel Turning

TRANSPORTATION
GENERAL ENGINEERING
ENERGY



Crankshaft/Camshaft
Roughing and Finishing



Connecting Rods
Boring



Gears
Roughing and Finishing

M Stainless Steel Turning

AEROSPACE
ENERGY



Turbo Charger
Roughing and Finishing



Flanges
Roughing and Finishing



Bearing Housing
Roughing and Finishing

K Cast Iron Turning

TRANSPORTATION
GENERAL ENGINEERING



Cylinder Liner
Roughing and Finishing



Engine Block



Brake Drum and Disc

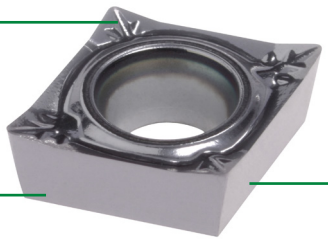
Inserts for Machining Aluminium

WIDIA™ offers a series of inserts specifically designed for machining aluminium materials. These inserts are available in both an uncoated and a PVD grade for better performance and better tool life.

- Easy-to-choose platform — two geometry and three grades.
- Longer tool life.

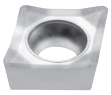
Materials:

N

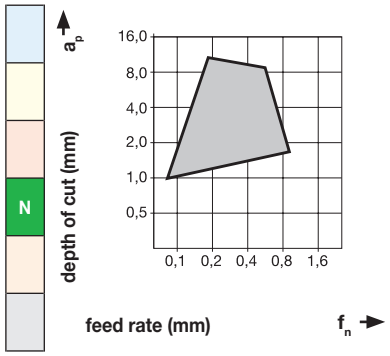


Positive Inserts

AL1



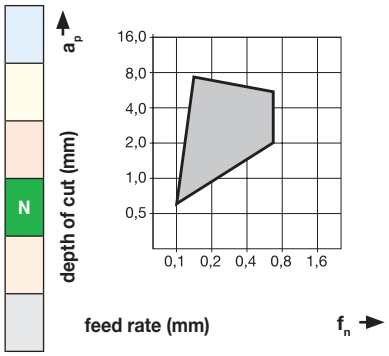
For turning cast aluminium, light alloys, non-ferrous metals, high-melting metals, plastics, glass fibre, reinforced plastics, laminated board, carbon, and fine ceramics.



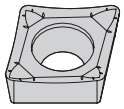
AL3

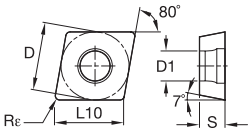


For cost-effective machining of aluminium, non-ferrous metals, and plastics. Extremely sharp cutting edges result in optimum part finishes with low cutting forces and short chips. Finishing of steel, stainless steel, and grey iron is possible with the coated grade HCK10™.



CCGT-AL3



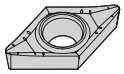


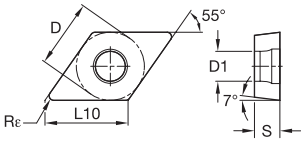
● first choice
○ alternate choice

P			
M			
K			
N		●	●
S			
H			

ISO catalogue number	D	L10	S	Rε	D1	HCK10	HWK15
CCGT060202AL3	6,35	6,45	2,38	0,2	2,80	2022257	2022258
CCGT060204AL3	6,35	6,45	2,38	0,4	2,80	2022259	2022260
CCGT09T302AL3	9,53	9,67	3,97	0,2	4,40	-	2022854
CCGT09T304AL3	9,53	9,67	3,97	0,4	4,40	-	2022262
CCGT120408AL3	12,70	12,90	4,76	0,8	5,50	2022325	2022326

DCGT-AL3



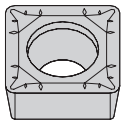


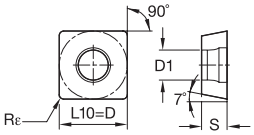
● first choice
○ alternate choice

P			
M			
K			
N		●	●
S			
H			

ISO catalogue number	D	L10	S	Rε	D1	HCK10	HWK15
DCGT070204AL3	6,35	7,75	2,38	0,4	2,80	-	2022330
DCGT11T302AL3	9,53	11,63	3,97	0,2	4,40	-	2022861
DCGT11T304AL3	9,53	11,63	3,97	0,4	4,40	2014890	2022331
DCGT11T308AL3	9,53	11,63	3,97	0,8	4,40	-	2022483

SCGT-AL3



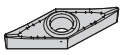


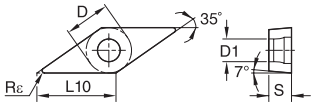
● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

ISO catalogue number	D	L10	S	Rε	D1	HWK15
SCGT120408AL3	12,70	12,70	4,76	0,8	5,50	2023638

VCGT-AL3





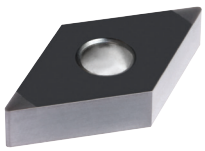
● first choice
○ alternate choice

P		
M		
K		
N	●	●
S		
H		

ISO catalogue number	D	L10	S	Rε	D1	HCK10	HWK15
VCGT110302AL3	6,35	11,07	3,18	0,2	2,80	-	2024559
VCGT160404AL3	9,53	16,61	4,76	0,4	4,40	2022484	2022485
VCGT160408AL3	9,53	16,61	4,76	0,8	4,40	-	2022488

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

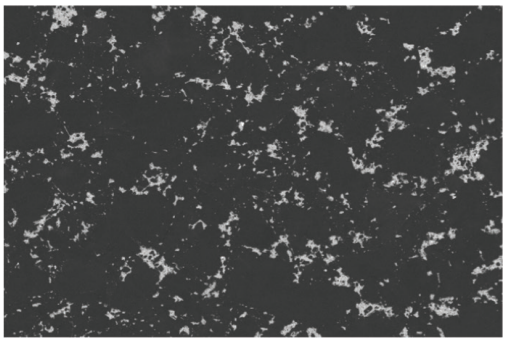
PCD Grades for Turning Non-Ferrous Materials

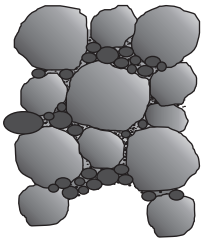


- Two PCD grades — WDN25U and WDN00U — cover a wide range of applications.
- Grades provide outstanding performance to increase productivity and cut manufacturing costs.
- High abrasion and chipping resistance.
- Used in machining aluminium alloys with low- and high-silicon content, copper alloys, ceramics, and plastics.
- Suitable for machining highly abrasive materials such as titanium and Metal Matrix Composites (MMC).

WDN25U™

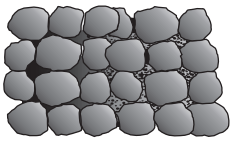
- Multi-modal grade.
- Versatile grade for general machining applications.
- Withstands moderate interruptions.

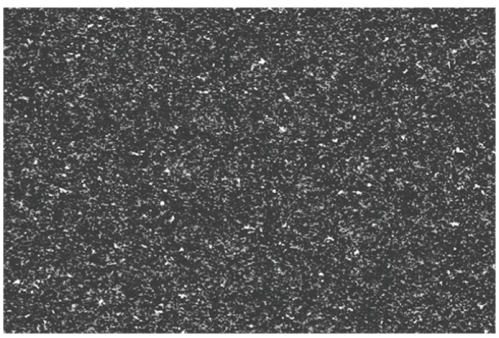




WDN00U™

- Ultra-fine grain grade.
- Ideal for high-speed finishing operations.
- Fine grain structure provides a finer edge prep and better surface finish.





Tools for External Turning

Modern machining operations performed on CNC machine tools and flexible production facilities require high-performance tools that provide straight forward design and application versatility. WIDIA™ offers an extensive range of toolholders for external turning to meet even the most exacting production demands across a broad spectrum of workpiece shapes and sizes.

Whatever your operation requirements — from light finishing cuts at very high cutting speeds to heavy roughing applications — there is a WIDIA solution. The complete programme includes toolholders for pin-, screw-, or clamp-type holding.



D-Style Clamping

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

P-Style Clamping

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.

P-style available in metric sizes only.

S-Style Clamping

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

C-Style Clamping

- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

Victory™ Insert MR Geometry



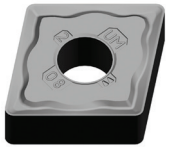
For medium to light roughing of steels, difficult-to-machine high alloy titanium and aluminium materials. High strength to deal with heavy chip deformation.

Victory Insert RH Geometry



For medium-duty to roughing. Outstanding chip control. High edge strength for interrupted cuts, forging skin or scale. Preferred for all cast iron such as grey, malleable, and nodular.

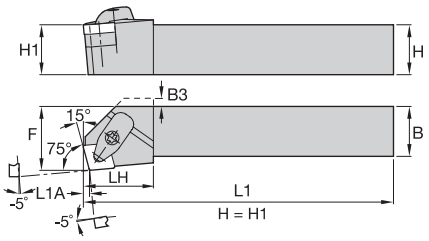
Victory Insert UM Geometry

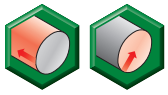


For medium-duty turning operations. Soft-cutting chipbreaker. Used in applications producing varying chip sections, such as profile or copy turning.

DCKN 75°

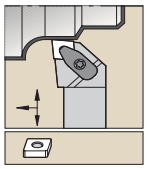


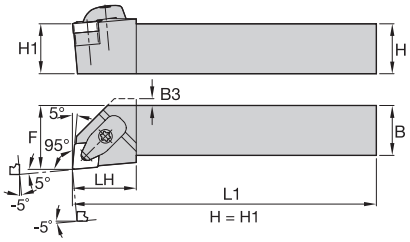




order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert
right hand									
5697857	**DCKNR2525M12KC04**	25	25	32,0	150	32,0	3,1	–	CN..120408
left hand									
5697854	**DCKNL2525M12KC04**	25	25	32,0	150	32,0	3,1	–	CN..120408

DCLN 95°

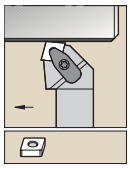


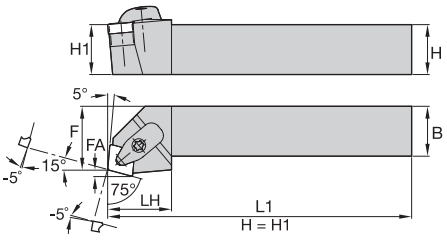


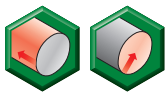


order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5697893	**DCLNR2525M12KC04**	25	25	32,0	150	32,0	–	CN..120408
5697894	**DCLNR2525M16KC06**	25	25	32,0	150	33,0	–	CN..160612
5697895	**DCLNR3232P16KC06**	32	32	40,0	170	33,0	–	CN..160612
left hand								
5697884	**DCLNL2525M12KC04**	25	25	32,0	150	32,0	–	CN..120408
5697885	**DCLNL2525M16KC06**	25	25	32,0	150	33,0	–	CN..160612

DCRN 75°

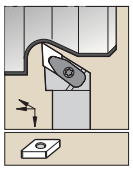


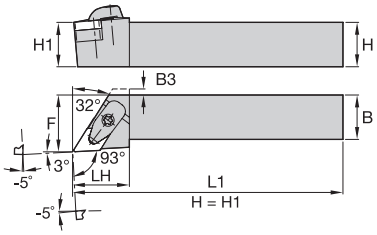


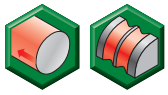


order number	catalogue number	H	B	F	L1	LH	FA	gage insert
right hand								
5697904	**DCRNR2525M12KC04**	25	25	32,0	150	32,0	3,3	CN..120408
left hand								
5697900	**DCRNL2525M12KC04**	25	25	32,0	150	32,0	3,3	CN..120408

DDJN 93°

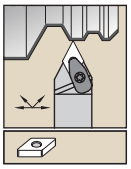


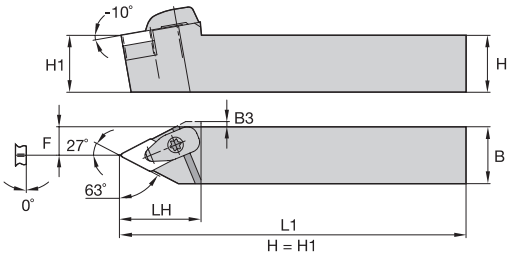


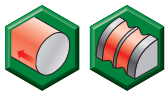


order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5697930	DDJNR2525M15KC06	25	25	32,0	150	32,0	–	DN..150608
left hand								
5697920	DDJNL2525M15KC06	25	25	32,0	150	32,0	–	DN..150608

DDNN 63°

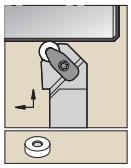


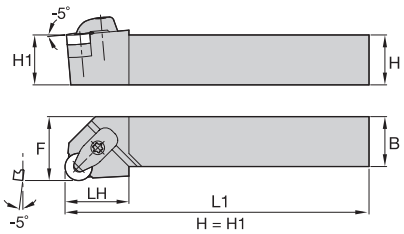




order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5697942	DDNNR2525M15KC06	25	25	13,0	150	40,0	–	DN..150608
left hand								
5697936	DDNNL2525M15KC06	25	25	13,0	150	40,0	–	DN..150608

DRGN

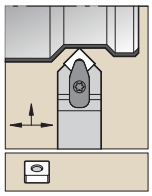


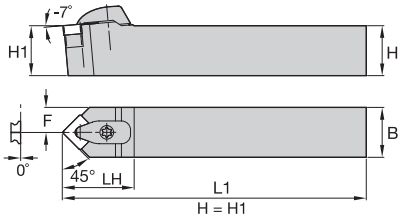




order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
5697948	DRGNR2525M12KC04	25	25	32,0	150	32,0	RN..120400

DSDN 45°

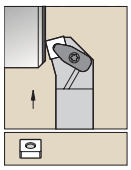


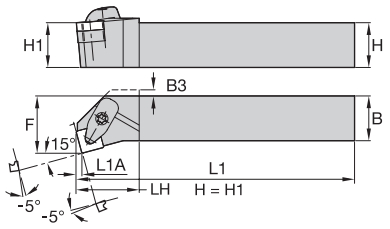


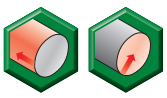


order number	catalogue number	H	B	F	L1	LH	gage insert
5697955	DSDNN2525M12KC04	25	25	12,0	150	36,0	SN..120408

DSKN 75°

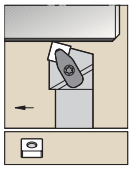


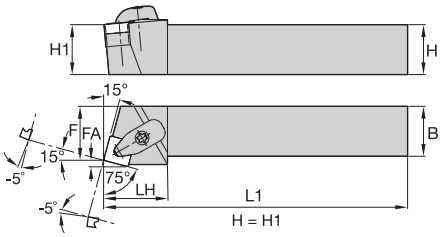


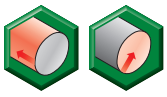


order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert
right hand									
5696686	DSKNR2525M12KC04	25	25	32,0	150	32,0	3,1	4,0	SN..120408

DSRN 75°



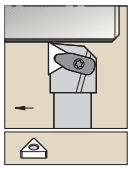


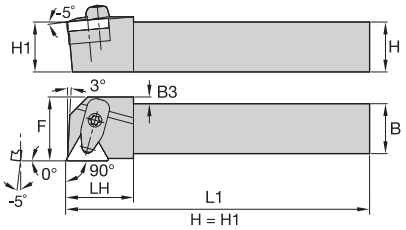


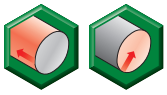
order number	catalogue number	H	B	F	L1	LH	FA	gage insert
right hand								
5696704	DSRNR2525M12KC04	25	25	27,0	150	32,0	3,3	SN..120408
left hand								
5696700	DSRNL2525M12KC04	25	25	27,0	150	32,0	3,3	SN..120408

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DTGN 90°

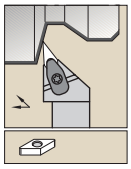


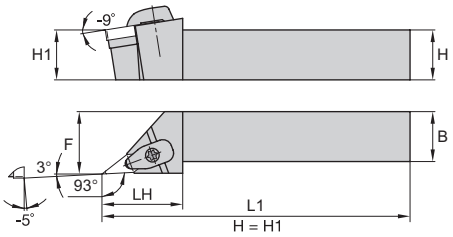


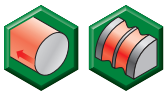


order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5696730	DTGNR2525M16KC04	25	25	32,0	150	25,0	–	TN..160408
left hand								
5696728	DTGNL2525M16KC04	25	25	32,0	150	25,0	–	TN..160408

DVJN 93°

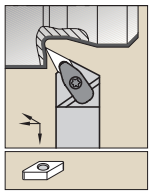


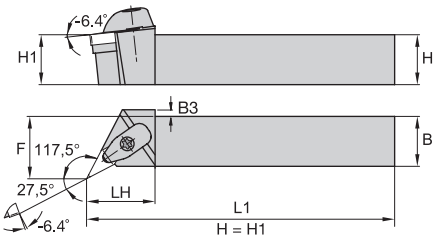


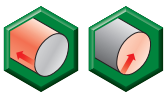


order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
5696738	DVJNR2525M16KC04	25	25	32,0	150	46,0	VN..160408
left hand							
5696733	DVJNL2525M16KC04	25	25	32,0	150	46,0	VN..160408

DVON 117,5°



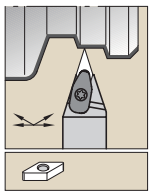


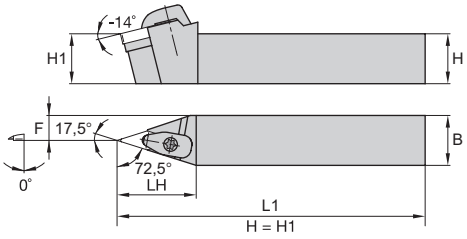


order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5696746	DVONR2525M16KC04	25	25	32,0	150	38,0	–	VN..160408
left hand								
5696743	DVONL2525M16KC04	25	25	32,0	150	38,0	–	VN..160408

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DVVN 72,5°

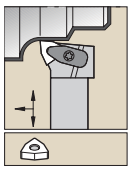


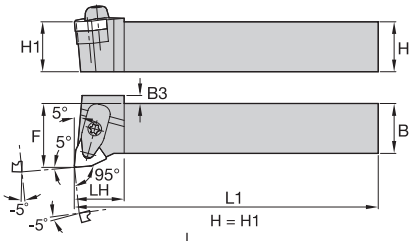




order number	catalogue number	H	B	F	L1	LH	gage insert
5696749	DVVNN2525M16KC04	25	25	12,0	150	48,0	VN..160408

DWLN 95°

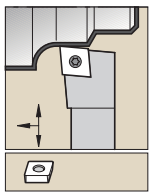


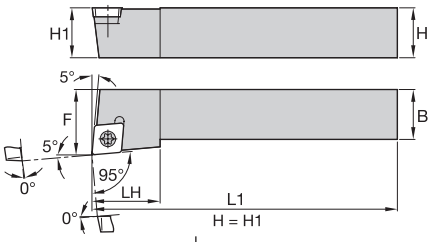




order number	catalogue number	H	B	F	L1	LH	B3	gage insert
right hand								
5696760	DWLNR2525M08KC04	25	25	32,0	150	25,0	4,0	WN..080408
left hand								
5696754	DWLNL2525M08KC04	25	25	32,0	150	25,0	4,0	WN..080408

SCLC 95°

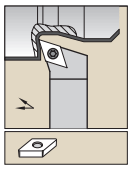


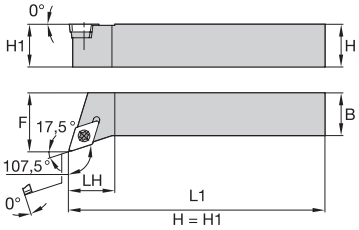


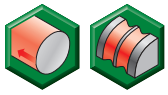


order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879416	SCLCR1616H09	16	16	20,0	100	15,8	CC..09T308
3879414	SCLCR2020K12	20	20	25,0	125	19,8	CC..120408

SDHC 107,5°

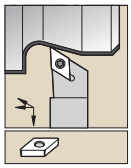


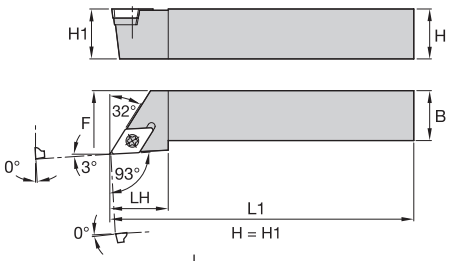


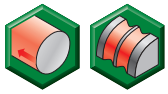


order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879440	SDHCR2525M11	25	25	32,0	150	20,0	DC..11T308
left hand							
3879438	SDHCL2525M11	25	25	32,0	150	20,0	DC..11T308

SDJC 93°

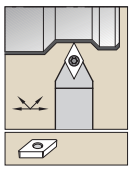


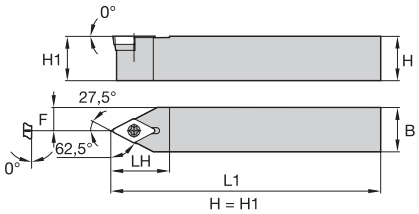


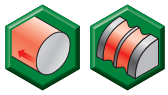


order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879461	SDJCR2525M11	25	25	32,0	150	22,1	DC..11T308
left hand							
3879453	SDJCL2525M11	25	25	32,0	150	22,1	DC..11T308

SDNC 62,5°



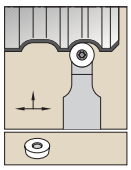


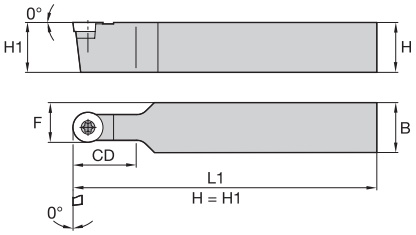


order number	catalogue number	H	B	F	L1	LH	gage insert
3879849	SDNCN2525M11	25	25	12,5	150	24,9	DC..11T308

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SRDC

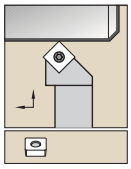


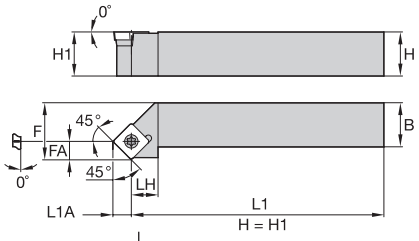




order number	catalogue number	H	B	F	L1	CD	gage insert
3900183	SRDCN2525M06	25	25	15,0	150	19,7	RC..0602M0
3879737	SRDCN2525M08	25	25	16,5	150	25,0	RC..0803M0
3879734	SRDCN2525M10	25	25	17,5	150	25,0	RC..10T3M0
3879738	SRDCN2525M12	25	25	18,5	150	25,0	RC..1204M0

SSSC 45°

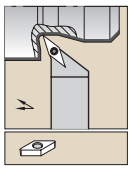


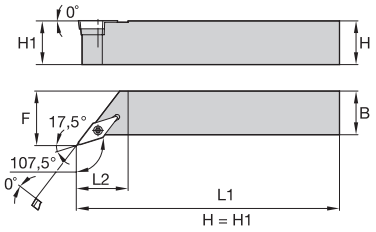


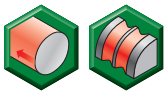


order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert
right hand									
3879746	SSSCR2020K12	20	20	25,0	125	25,0	8,3	8,3	SC..120408

SVHB 107,5°

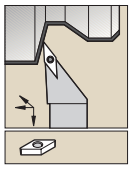


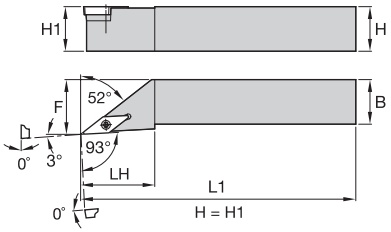


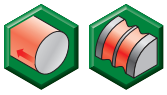


order number	catalogue number	H	B	F	L1	L2	gage insert
right hand							
3879765	SVHBR2525M16	25	25	32,0	150	28,0	VB..160408
left hand							
3879766	SVHBL2525M16	25	25	32,0	150	28,0	VB..160408

SVJB 93°

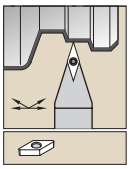


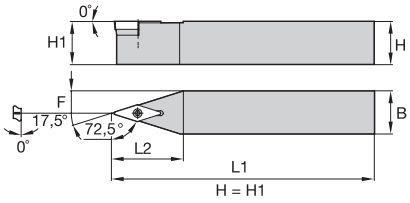


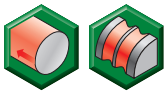


order number	catalogue number	H	B	F	L1	LH	gage insert
right hand							
3879776	**SVJBR2020K16**	20	20	25,0	125	35,0	VB..160408
3879775	**SVJBR2525M16**	25	25	32,0	150	35,0	VB..160408
3879773	**SVJBR3225P16**	32	25	32,0	170	35,0	VB..160408
left hand							
3879774	**SVJBL2525M16**	25	25	32,0	150	35,0	VB..160408

SVVB 72,5°







order number	catalogue number	H	B	F	L1	L2	gage insert
3879778	**SVVBN2525M16**	25	25	12,5	150	33,0	VB..160408

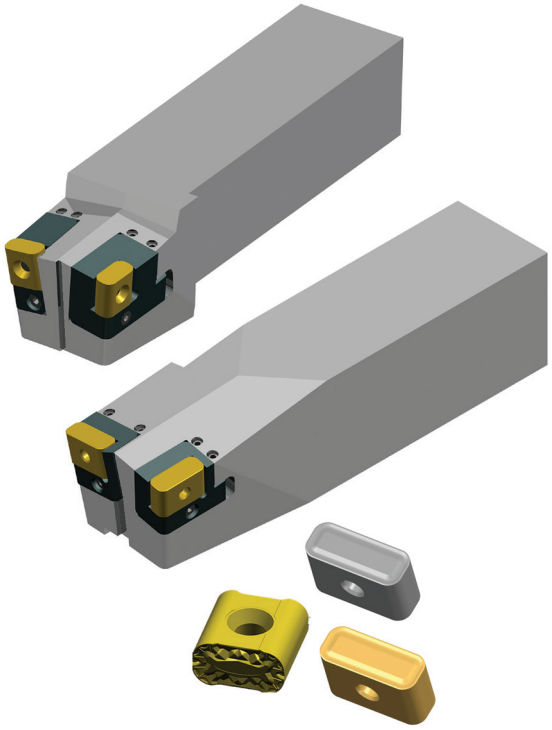
THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

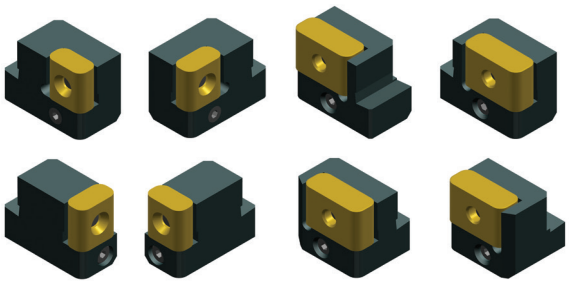
Heavy-Duty Turning

This line of heavy-duty machining tooling offers a wide selection of geometries and grades for cost-effective machining in these operations.

Railway

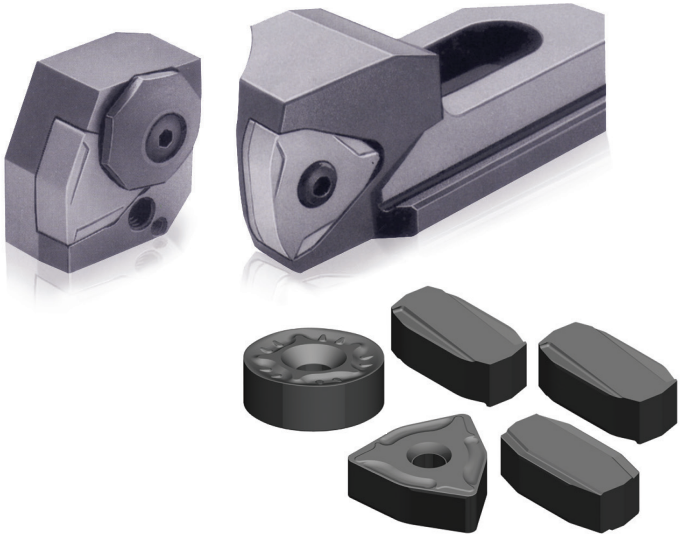
Tooling built specifically for machining railway wheels and axles. In terms of wheel processing, they are usually defined by group, such as “New” wheel tooling for machining newly cast or forged wheels, or “RWRT” (railway wheel re-turning) tooling for machining used wheels and form milling tools for milling the form of used railway wheels.





Bar Peeling

An extremely efficient method for sizing and finishing surfaces on round material stock.



Tools for Internal Boring

Today's modern boring operations require the most reliable, high-performance tools. WIDIA™ offers an extensive range of toolholders for internal boring to meet the most precise production demands. Internal boring bars provide consistent results and enhanced production reliability.



D-Style Clamping

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

P-Style Clamping

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.

P-style available in metric sizes only.

S-Style Clamping

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

C-Style Clamping

- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

Victory™ Insert FP Geometry



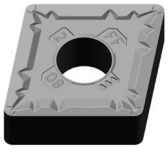
For finishing to medium turning operations with optimal chip control over a wide range of cutting conditions and workpiece materials.

Victory Insert MP Geometry



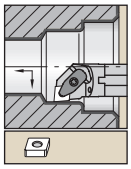
For medium to rough turning with reduced cutting forces and improved chip control for high feed rates. Suitable for high metal removal rates and spindling applications.

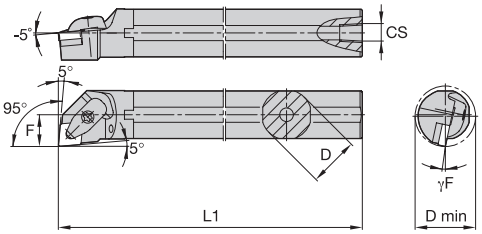
Victory Insert FF Geometry



For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.

A-DCLN 95°

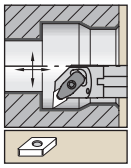


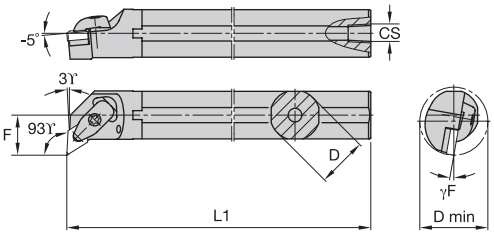




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696071	A25RDCLNR12KC04	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN.120408
5696073	A32SDCLNR12KC04	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN.120408
left hand								
5696072	A25RDCLNL12KC04	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN.120408
5696074	A32SDCLNL12KC04	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN.120408

A-DDUN 93°

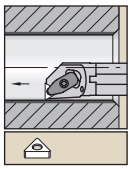


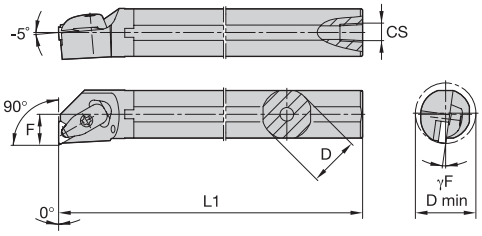




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696211	A32SDDUNR11KC04	32	40,0	22,0	250	1/4-18 NPT	-12.0	DN..110408
5696213	A32SDDUNR15KC06	32	40,0	22,0	250	1/4-18 NPT	-12.0	DN..150608
left hand								
5696214	A32SDDUNL15KC06	32	40,0	22,0	250	1/4-18 NPT	-12.0	DN..150608

A-DTFN 90°

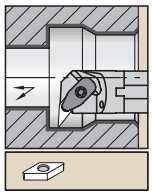


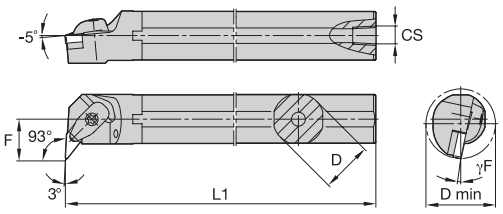




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696219	A25RDTFNR16KC04	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408
5696261	A32SDTFNR16KC04	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408
left hand								
5696260	A25RDTFNL16KC04	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408

A-DVUN 93°

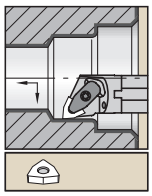


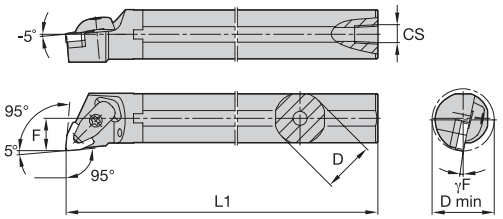




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696263	**A32SDVUNR16KC04**	32	40,0	22,0	250	1/4-18 NPT	-10.5	VN..160408

A-DWLN 95°

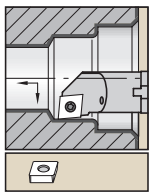


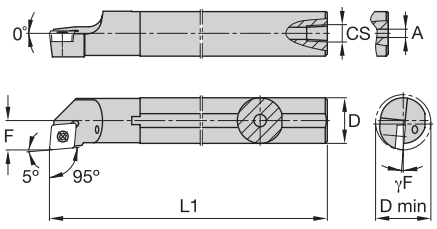




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
5696269	**A25RDWLNR08KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408
5696281	**A32SDWLNR08KC04**	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408
left hand								
5696268	**A25RDWLNL06KC04**	25	32,0	17,0	200	1/4-18 NPT	-14.0	WN..060408
5696280	**A25RDWLNL08KC04**	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408
5696282	**A32SDWLNL08KC04**	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408

A-SCLC 95°

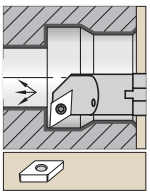


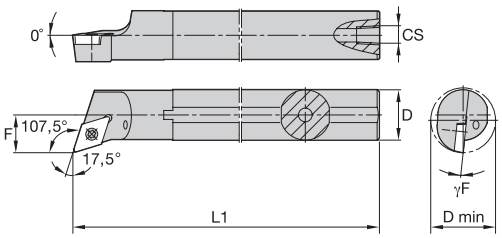




order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
3883285	**A08JSCLCR06**	8	11,0	6,0	110	2,4	–	-8.0	CC..060204
3883283	**A10KSCLCR06**	10	13,0	7,0	125	3,2	–	-7.0	CC..060204
3883271	**A16RSCLCR09**	16	20,0	11,0	200	–	1/8-27 NPT	-7.0	CC..09T308
3883269	**A20SSCLCR09**	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308
left hand									
3883272	**A16RSCLCL09**	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308
3883270	**A20SSCLCL09**	20	25,0	13,0	250	–	1/8-27 NPT	-5.0	CC..09T308

A-SDQC 107,5°

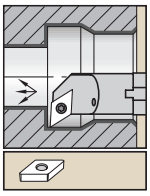


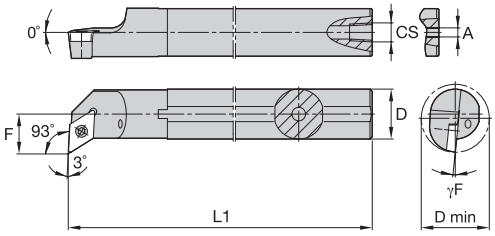




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
3883474	**A20SSDQCR11**	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308
3883462	**A25TSDQCR11**	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308
left hand								
3883475	**A20SSDQCL11**	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308
3883473	**A25TSDQCL11**	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308

A-SDUC 93°

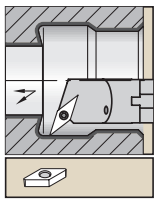


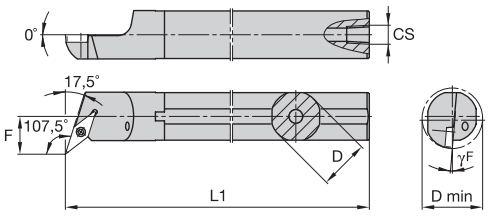




order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert
right hand									
3883291	**A20SSDUCR11**	20	25,0	13,0	250	–	1/8-27 NPT	-5.0	DC..11T308
3883288	**A25TSDUCR11**	25	32,0	17,0	300	–	1/8-27 NPT	-4.0	DC..11T308
left hand									
3883292	**A20SSDUCL11**	20	25,0	13,0	250	–	1/8-27 NPT	-5.0	DC..11T308
3883290	**A25TSDUCL11**	25	32,0	17,0	300	–	1/8-27 NPT	-4.0	DC..11T308

A-SVQB 107,5°

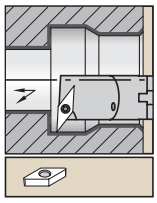


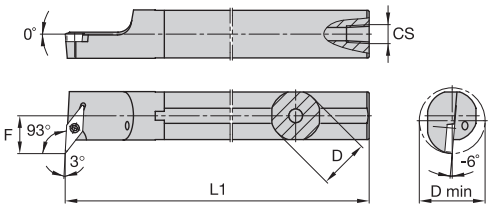




order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert
right hand								
3883434	**A25TSVQBR16**	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408
left hand								
3883435	**A25TSVQBL16**	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408

A-SVUB 93°







order number	catalogue number	D	D min	F	L1	CS	gage insert
right hand							
3883438	**A25TSVUBR16**	25	32,0	17,0	300	1/4-18 NPT	VB..160408
left hand							
3883439	**A25TSVUBL16**	25	32,0	17,0	300	1/4-18 NPT	VB..160408

THE ALL-STAR PROGRAMME FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

Cartridges

Modern machining operations demand high-quality, high-performance toolholders that provide straightforward design and application versatility.

Standard WIDIA™ cartridges are ideal for turning tools with one, or several, cutting edges. A wide range of cartridge sizes and styles provide numerous combinations and application possibilities.



Simple and secure mounting to the tool by a single cartridge clamping screw.

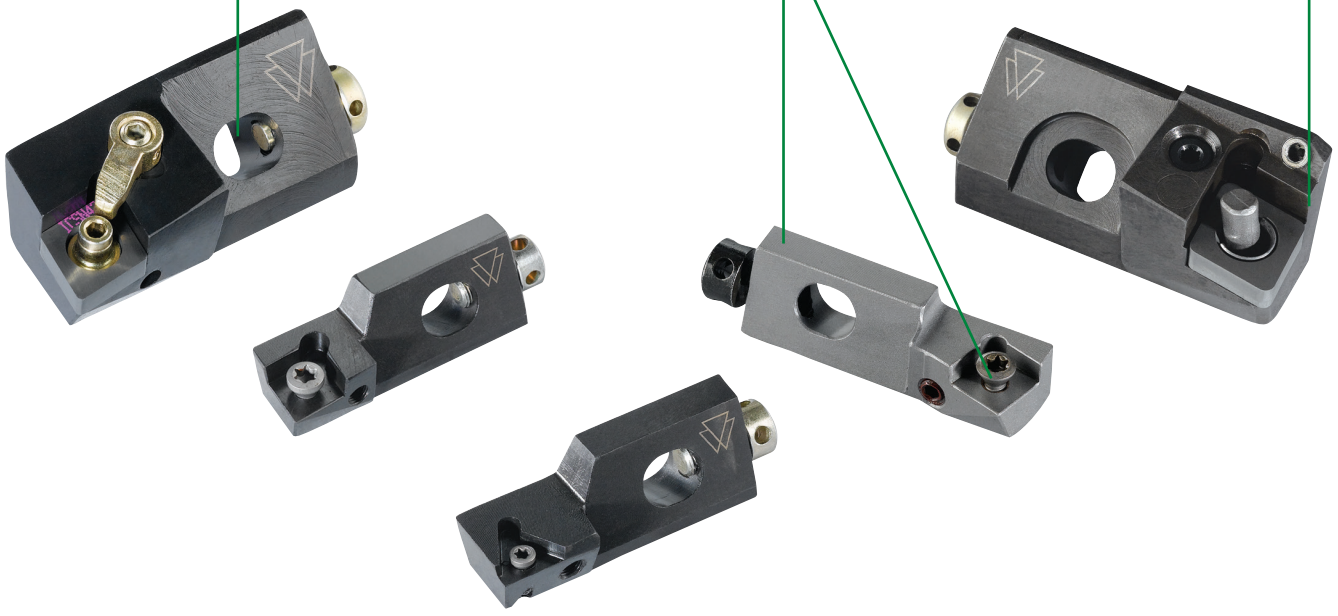
High accuracy on “F” dimension ensures proper application to minimum bore dimensions.

Same clamping systems as standard turning toolholders.

Overall sizes to DIN and ISO are ideal for single- and multi-tooth turning, boring, and spotting tools.

See pages E6–E60 for inserts.
Steel shank with through coolant.

Precise axial and radial positioning by adjustment screws.



GROOVING & CUT-OFF

WGC

Pages E80–E88

The most versatile tool in the market in grooving, profiling, and cut-off operations.



WMT™

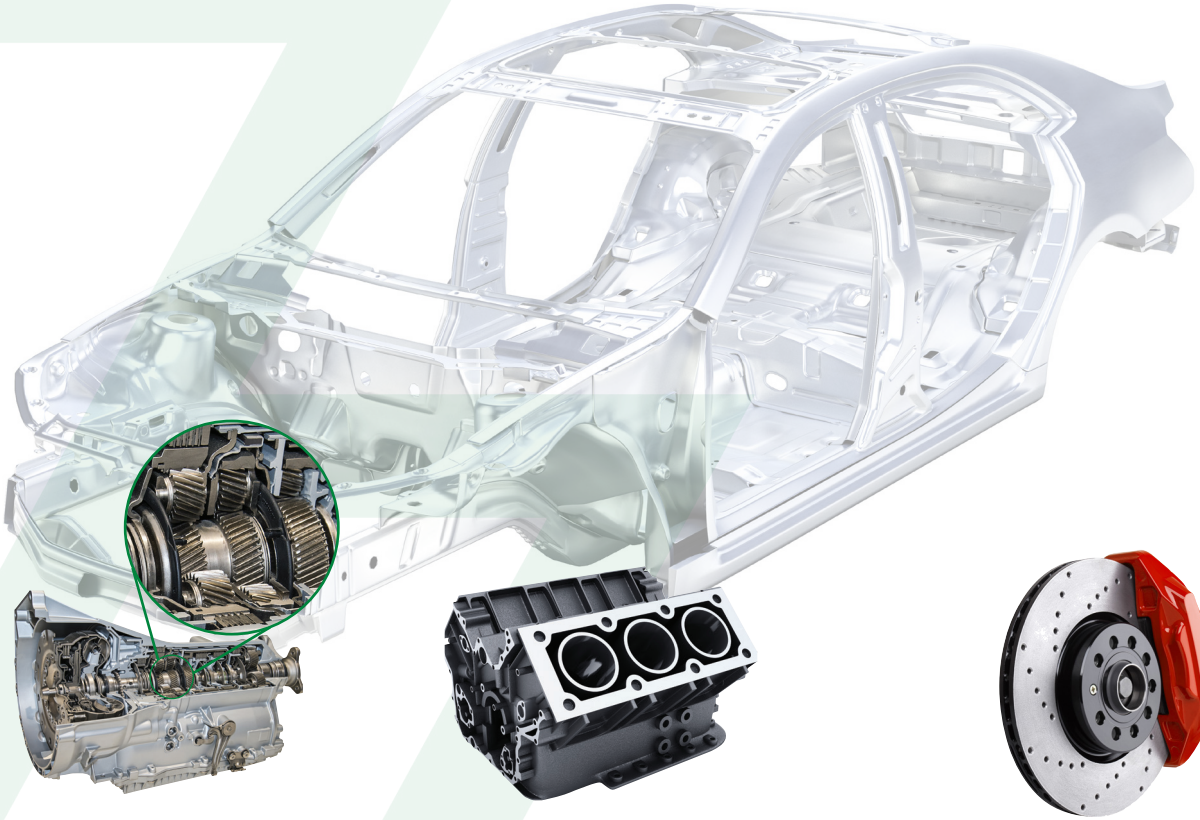
Pages E90–E100

The WMT platform is the economical and reliable option for all your grooving, cut-off, turning, and profiling applications.



ALL-STAR

AUTOMOTIVE



Gears

Cylinder Housing

Brakes and Steering



TRANSPORTATION

WIDIA™ manufactures tools to meet application needs in steel, cast iron, and aluminium automotive components.

TO SEE ALL PRODUCT LINES, VISIT OUR DIGITAL RESOURCES

WIDIA NOVO™ Application
Download to your desktop or tablet:
widia.com/novo

WIDIA™ Machining Central Mobile App
Download for iOS or Android:
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WIDIA™

youtube.com/WIDIASolutions linkedin.com/WIDIAProductGrp facebook.com/WIDIAProductGrp

To learn more, visit widia.com

WGC

WGC is the first choice and most versatile tool for grooving profiling and cut-off operations.

Grooving:

- First choice for external grooving applications in most workpiece materials.
- Through coolant capability and efficient coolant delivery for enhanced productivity.
- Available in integral and modular style toolholders.
- Groove width 2–10mm (0.0787–0.394").

Cut-Off:

- Specially engineered chipbreakers for effective parting/cut-off, and deep grooving.
- Positive geometry for lower forces.
- Secure seating offers greatest stability.
- Groove width: 1.4–8mm (0.055–0.315").

Profiling:

- Full radius chipbreakers for multidirectional turning and generating complex profiles.
- Rigid design ensures smooth surface finish.
- Groove width: 3–8mm (0.118–0.315").

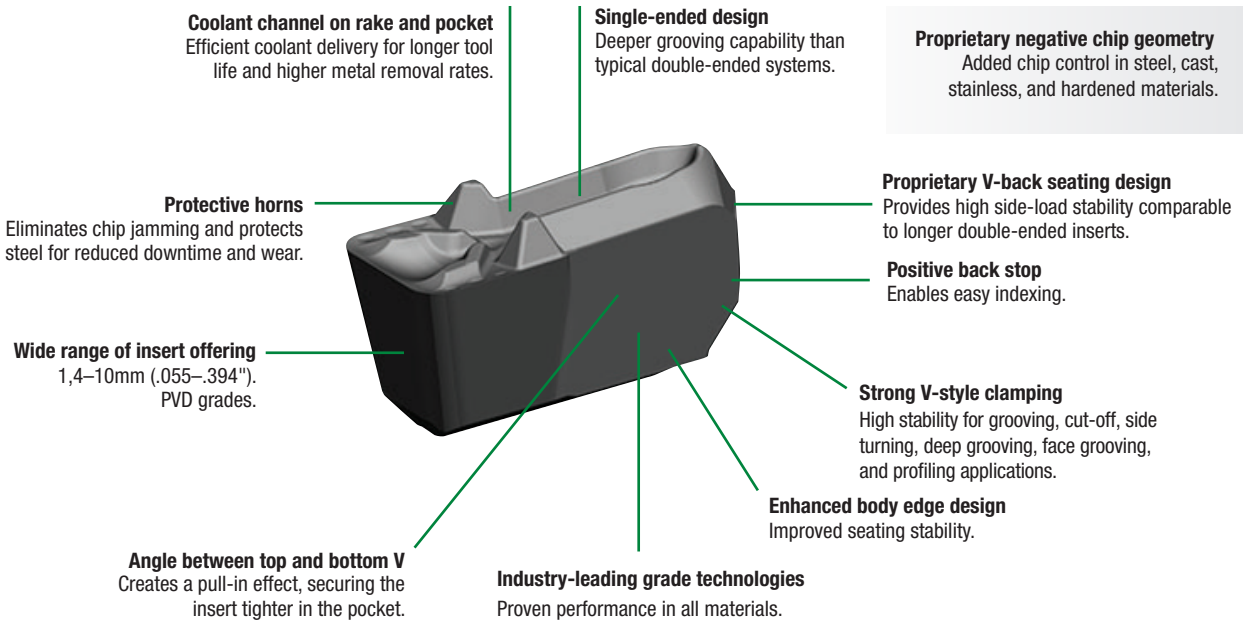
4 BENEFITS IN 1

VERSATILE
GROOVING, PROFILING, AND CUT-OFF OPERATIONS

SIMPLE
EASY TO SELECT AND APPLY

STABLE
TRIPLE-V SEATING FOR SECURE CLAMPING

PRODUCTIVE
LOW CUTTING FORCES IN THROUGH COOLANT FOR BETTER CHIP EVACUATION



Grooving Precision Moulded



P M N S

PT-Positive Rake



P M K H

PN-Negative Rake

Cut-Off Precision Moulded



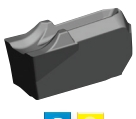
P M N S

F-Fine



P K

M-Medium



P M

R-Rough

Profiling Precision Moulded

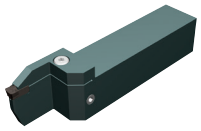


P M N S

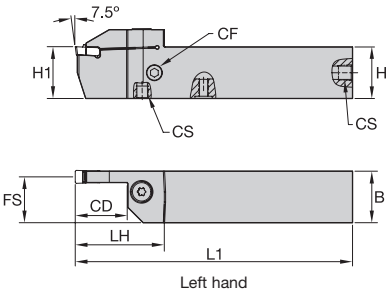
PC-Full Radius

NOTE: Use the NOVO™ software to select appropriate tooholder and insert.

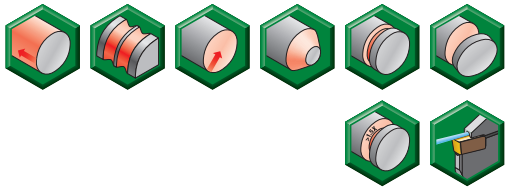
Integral Straight • Metric



Left hand



Left hand

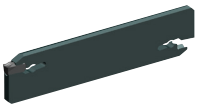


order number	catalogue number	SSC	CD	H1	H	B	H2	L1	FS	LH	CF	CS
right hand												
6461946	**WGCSMR2020K0216**	2	16	20	20	20	27	125	19	31	–	–
6461948	**WGCSMR2525M0216**	2	16	25	25	25	32	150	24	31	–	–
6461952	**WGCSMR2525M0226**	2	26	25	25	25	34	150	24	42	–	–
6462005	**WGCSMR2020K0322C**	3	22	20	20	20	30	125	19	43	M8X1	M8X1
6462006	**WGCSMR2525M0326C**	3	26	25	25	25	35	150	24	47	G 1/8	G 1/8
6462008	**WGCSMR2525M0416C**	4	16	25	25	25	34	150	23	37	G 1/8	G 1/8
6462010	**WGCSMR2525M0426C**	4	26	25	25	25	35	150	23	47	G 1/8	G 1/8
left hand												
6461954	**WGCSML2020K0216**	2	16	20	20	20	27	125	19	31	–	–
6461960	**WGCSML2525M0226**	2	26	25	25	25	34	150	24	42	–	–
6462080	**WGCSML2020K0322C**	3	22	20	20	20	30	125	19	43	M8X1	M8X1
6462091	**WGCSML2525M0326C**	3	26	25	25	25	35	150	24	47	G 1/8	G 1/8
6462099	**WGCSML2525M0526C**	5	26	25	25	25	35	150	23	47	G 1/8	G 1/8

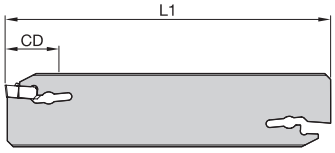
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

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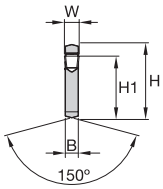
Double-Ended Cut-Off Blade



Straight

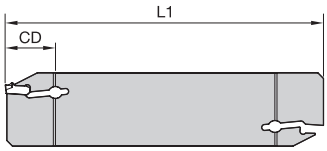


Straight

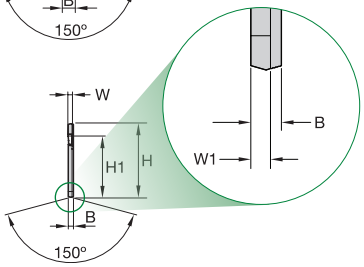


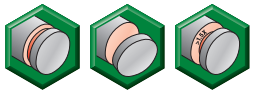


Reinforced



Reinforced



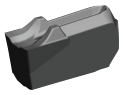


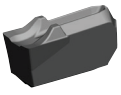
order number	catalogue number	SSC	H	W	W1	H1	L1	B	CD
neutral hand									
6499212	**WGCBSN26J0230**	2	26	2,0	–	21,5	110	1,65	30
6499213	**WGCBSN32M0250**	2	32	2,0	–	25,1	150	1,65	50
6499214	**WGCBSN26J0340**	3	26	3,0	–	21,5	110	2,40	40
6499215	**WGCBSN32M0350**	3	32	3,0	–	25,1	150	2,40	50
6499217	**WGCBSN32M0450**	4	32	4,0	–	25,1	150	3,40	50
6499218	**WGCBSN32M0560**	5	32	5,0	–	25,1	150	4,40	60
6499221	**WGCBSN52X08120**	8	53	8,0	–	45,3	260	7,00	120

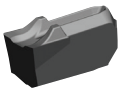
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

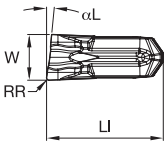
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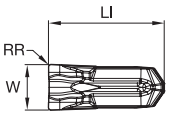

Left Hand


Neutral

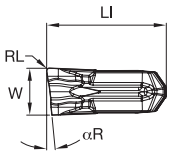

Right Hand



Left Hand



Neutral



Right Hand

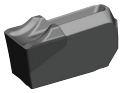
● first choice
○ alternate choice

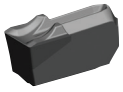
P		●
M		●
K		○
N		○
S		●
H		

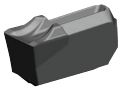
catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU25PT
WC020M02N00F02	2	2,00	0,050	9,00	–	–	0,20	0,20	6470548
WC020M02R06F02	2	2,00	0,050	9,00	6	–	–	0,20	6470549
WC030M03L06F02	3	3,00	0,075	9,60	–	6	0,20	–	6470550
WC030M03N00F02	3	3,00	0,075	9,60	–	–	0,20	0,20	6470561
WC030M03R06F02	3	3,00	0,075	9,60	6	–	–	–	6470562
WC040M04N00F02	4	4,00	0,075	10,19	–	–	0,20	0,20	6470564

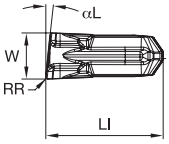
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

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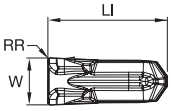

Left Hand


Neutral

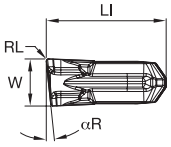

Right Hand



Left Hand



Neutral



Right Hand

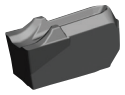
● first choice
○ alternate choice

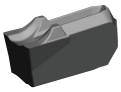
P		●
M		●
K		○
N		○
S		●
H		

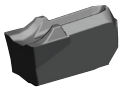
catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU25PT
WC020M02N00M02	2	2,00	0,050	8,98	–	–	0,20	0,20	6461862
WC030M03N00M02	3	3,00	0,075	9,60	–	–	0,20	0,20	6461865
WC040M04N00M02	4	4,00	0,075	10,20	–	–	0,20	0,20	6461868
WC050M05N00M03	5	5,00	0,075	12,25	–	–	0,30	0,30	6461870
WC080M08N00M04	8	8,00	0,075	17,46	–	–	0,40	0,40	6461882

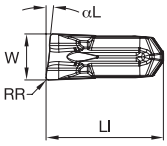
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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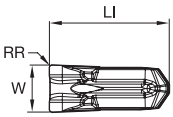

Left Hand


Neutral

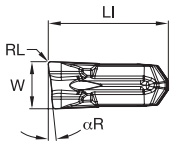

Right Hand



Left Hand



Neutral



Right Hand

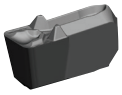
● first choice
○ alternate choice

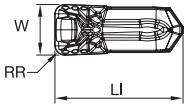
P		●
M		●
K		○
N		○
S		●
H		

catalogue number	SSC	W	W tol ±	LI	αR	αL	RR	RL	WU25PT
WC020M02N00R02	2	2,00	0,050	8,98	–	–	0,20	0,20	**6470427**
WC030M03N00R02	3	3,00	0,075	9,60	–	–	0,20	0,20	**6470430**
WC030M03R06R02	3	3,00	0,075	9,61	6	–	–	0,20	**6470461**

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Grooving Inserts • PT Precision Moulded • Metric





● first choice
○ alternate choice

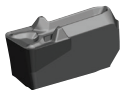
P		●
M		●
K		○
N		○
S		●
H		

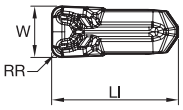
catalogue number	SSC	W	W tol ±	LI	RR	WU25PT
WG0212M02U02PT	2	2,13	0,050	8,97	0,20	**6461734**
WG0312M03U02PT	3	3,13	0,075	9,60	0,20	**6461736**
WG0312M03U04PT	3	3,13	0,075	9,60	0,40	**6461737**
WG0412M04U04PT	4	4,13	0,075	10,19	0,40	**6461738**
WG0412M04U08PT	4	4,13	0,075	10,19	0,80	**6461739**
WG0612M06U04PT	6	6,13	0,075	14,59	0,40	**6461822**
WG0812M08U08PT	8	8,13	0,075	17,45	0,80	**6461825**

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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Grooving Inserts • PN Precision Moulded • Metric





● first choice
○ alternate choice

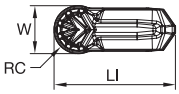
P		●
M		●
K		○
N		○
S		●
H		

catalogue number	SSC	W	W tol ±	RR	LI	WU25PT
WG0312M03U04PN	3	3,13	0,075	0,40	9,60	**6471043**
WG0412M04U08PN	4	4,13	0,075	0,80	10,20	**6471045**
WG0812M08U08PN	8	8,13	0,075	0,80	17,46	**6471050**

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Grooving Inserts • PC Full Radius Precision Ground • Metric





● first choice
○ alternate choice

P		●
M		●
K		○
N		○
S		●
H		

catalogue number	SSC	W	W tol ±	RC	LI	WU25PT
WR0200M02P00PC	2	2,00	0,025	1,00	8,91	**6470467**
WR0300M03P00PC	3	3,00	0,025	1,50	9,54	**6470468**
WR0400M04P00PC	4	4,00	0,025	2,00	10,13	**6470469**
WR0500M05P00PC	5	5,00	0,025	2,50	12,18	**6470470**
WR0800M08P00PC	8	8,00	0,025	4,00	17,41	**6470482**

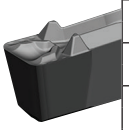
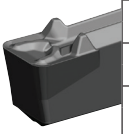
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

WGC Feed Rates

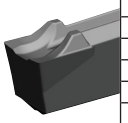
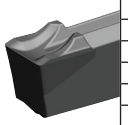
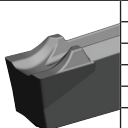
Plunge feed rates

● first choice
○ alternate choice

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

Chip Control	Description	Insert Geometry	Seat Size (SSC)	Corner Radius in (mm)	Starting Conditions in (mm)	Plunge Feed Rates inch/rev (mm/rev) .0020 (0,05)	.0040 (0,10)	.0060 (0,15)	.0080 (0,20)	.0100 (0,25)	.0120 (0,30)	.0140 (0,35)
-PT	Positive rake angle for lower cutting forces.		1F	.008 (0,2)	.0024 (0,06)	◇						
			2	.008 (0,2)	.0031 (0,08)		◇					
			3	.008 (0,2)	.0035 (0,09)		◇					
				.016 (0,4)	.0043 (0,11)			◇				
			4	.016 (0,4)	.0047 (0,12)			◇				
				.031 (0,8)	.0059 (0,15)			◇				
			5	.016 (0,4)	.0059 (0,15)			◇				
				.031 (0,8)	.0059 (0,16)			◇				
			6	.016 (0,4)	.0059 (0,15)			◇				
				.031 (0,8)	.0071 (0,18)				◇			
				.047 (1,2)	.0079 (0,20)				◇			
			8	.031 (0,8)	.0079 (0,20)				◇			
				.047 (1,2)	.0087 (0,22)					◇		
			10	.047 (1,2)	.0094 (0,24)					◇		
-PN	Stable negative cutting edge allowing for more aggressive applications.		1F	.008 (0,2)	.0024 (0,06)	◇						
			2	.008 (0,2)	.0031 (0,08)		◇					
			3	.008 (0,2)	.0035 (0,09)		◇					
				.016 (0,4)	.0043 (0,11)			◇				
			4	.016 (0,4)	.0047 (0,12)			◇				
				.031 (0,8)	.0059 (0,15)			◇				
			5	.016 (0,4)	.0059 (0,15)			◇				
				.031 (0,8)	.0059 (0,16)			◇				
			6	.016 (0,4)	.0059 (0,15)			◇				
				.031 (0,8)	.0071 (0,18)				◇			
				.047 (1,2)	.0079 (0,20)				◇			
			8	.031 (0,8)	.0079 (0,20)				◇			
				.047 (1,2)	.0087 (0,22)					◇		
			10	.047 (1,2)	.0094 (0,24)					◇		

Cut-Off Feed Rates

Geometry	Description	Insert Geometry	Seat Size (SSC)	Starting Conditions in (mm)	Cut-Off Feed Rates inch/rev (mm/rev) .0020 (0,05)	.0040 (0,10)	.0060 (0,15)	.0080 (0,20)	.0100 (0,25)	.0120 (0,30)	.0140 (0,35)	.0160 (0,40)
-F	Positive geometry for reduced cutting forces.		1B	.0024 (0,06)	◇							
			2	.0028 (0,07)		◇						
			3	.0035 (0,09)			◇					
			4	.0043 (0,11)				◇				
			5	.0051 (0,13)					◇			
-M	Stable cutting edge for aggressive feed rates. Primarily in cast iron.		1B	.0024 (0,06)	◇							
			2	.0028 (0,07)		◇						
			3	.0035 (0,09)			◇					
			4	.0043 (0,11)				◇				
			5	.0055 (0,14)					◇			
			6	.0063 (0,16)						◇		
			8	.0067 (0,17)							◇	
-R	Most stable cutting edge for steel.		2	.0039 (0,10)		◇						
			3	.0055 (0,14)			◇					
			4	.0063 (0,16)				◇				
			5	.0075 (0,19)					◇			
			6	.0083 (0,21)						◇		
			8	.0090 (0,23)							◇	

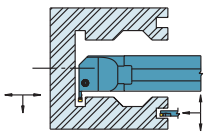
NOTE: For cut-off inserts with a lead angle, maximum feed rate should be reduced by up to 40%.

Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	0.8
N	1.2
S	0.8
H	0.5

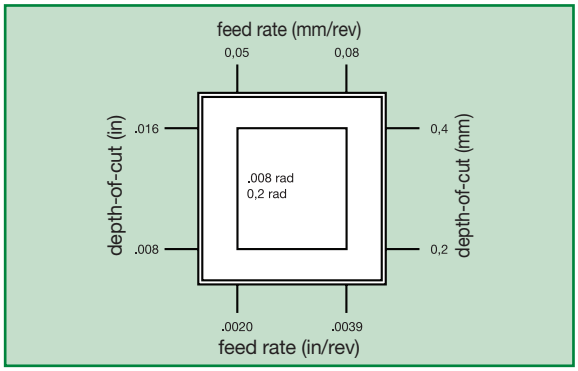
I.D. and Face Grooving
For I.D. and face grooving applications, reduce feed rate by 20%.



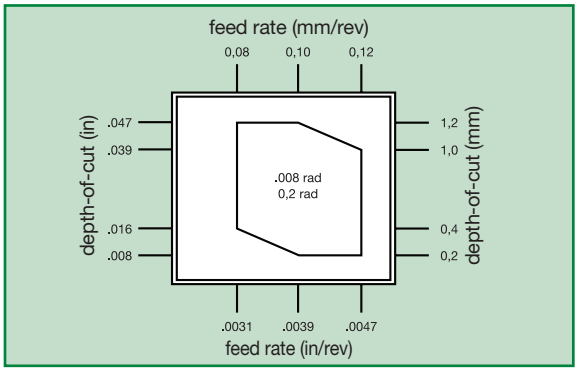
WGC Feed Rates

Turn and profile feed rates

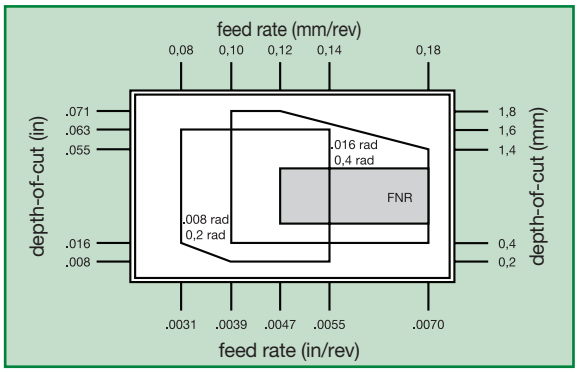
Seat Size 1F



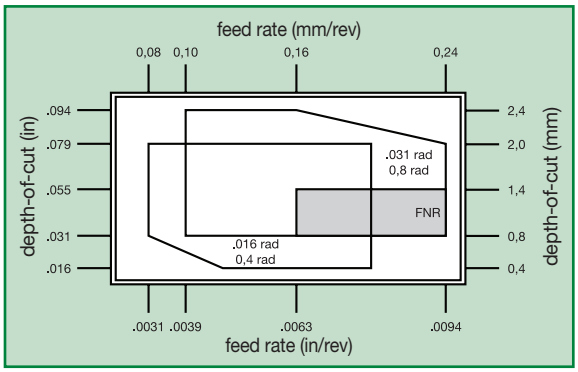
Seat Size 2



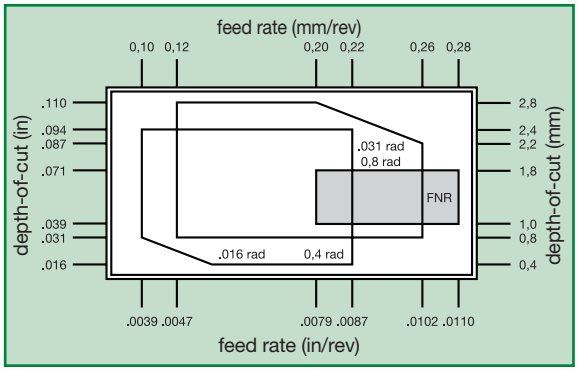
Seat Size 3



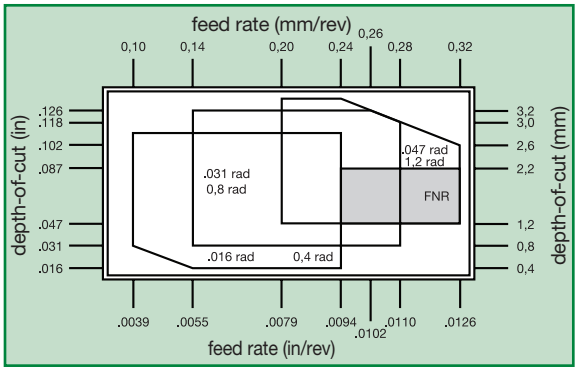
Seat Size 4



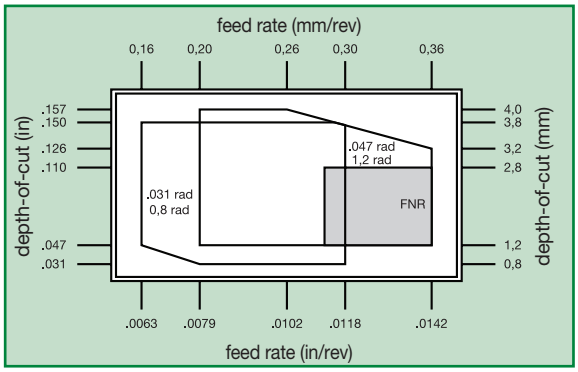
Seat Size 5



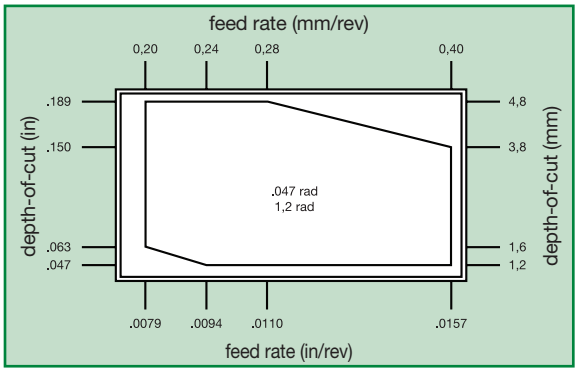
Seat Size 6



Seat Size 8



Seat Size 10



** FNR = Full Nose Radius*

Recommended Starting Speeds • Inch and Metric

Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	0.8
N	1.2
S	0.8
H	0.5

Material Group		WU25PT					
		Inch			Metric		
P	0–1	360	**740**	880	110	**225**	270
	2	360	**520**	880	110	**160**	260
	3	360	**410**	800	110	**125**	235
	4	200	**290**	540	60	**90**	160
	5	320	**530**	680	100	**160**	210
	6	280	**400**	600	85	**120**	185
M	1	300	**550**	800	90	**170**	245
	2	300	**500**	800	90	**150**	245
	3	300	**450**	700	90	**140**	210
K	1	320	**480**	760	100	**145**	225
	2	240	**400**	560	70	**120**	170
	3	160	**280**	400	50	**85**	120
N	1–2	400	**1440**	2560	120	**440**	780
	3	–	**–**	–	–	**–**	–
	4	320	**960**	1600	100	**290**	490
	5	240	**440**	640	70	**135**	195
	6	320	**560**	800	100	**170**	245
S	1	25	**125**	200	8	**40**	60
	2	25	**100**	250	8	**30**	75
	3	50	**125**	250	15	**40**	75
	4	25	**175**	350	8	**50**	110

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

Automotive



Gears

Cylinder Housing

Crankshaft/Camshaft

Brakes and Steering

TRANSPORTATION

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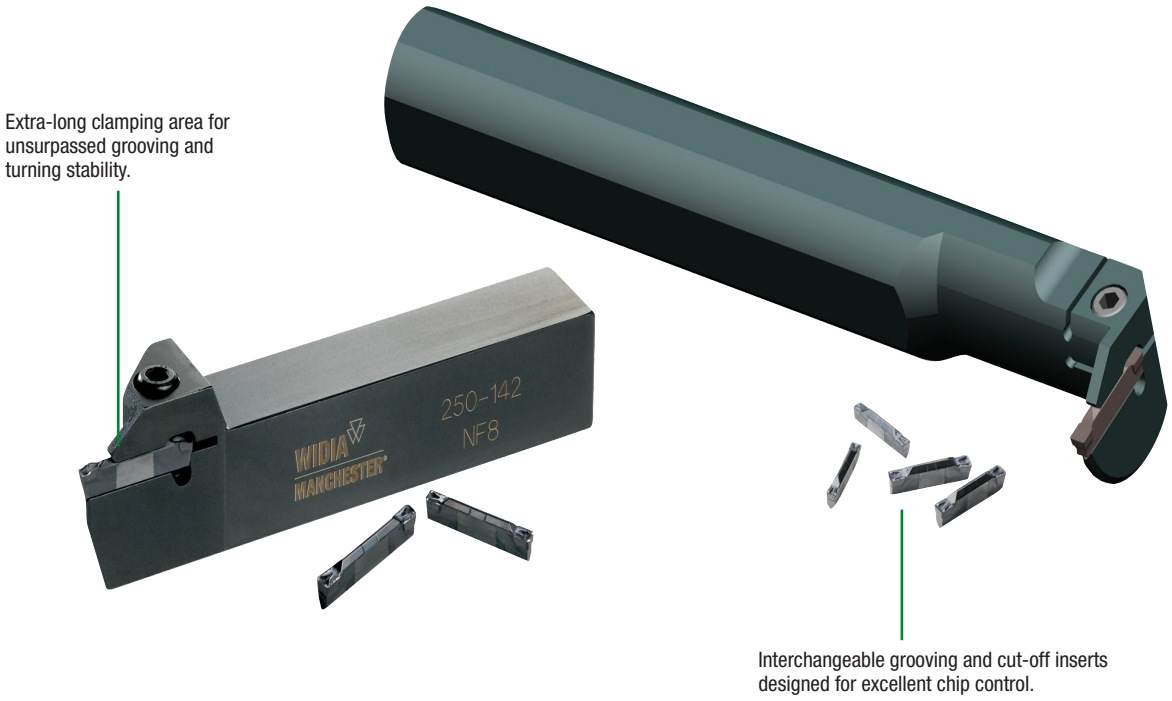
The most advanced turning, grooving, cut-off, and profiling system. WMT provides a complete line of grooving geometries and an extensive grade selection to meet the most demanding application requirements.

Rigid Clamping with Advanced Chip Control

- Specifically designed to increase speeds and feeds.
- Excellent geometry for even your most demanding deep grooving applications.
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WMT Toolholders

- Outstanding system rigidity and clamping capabilities.
- Guarantees fast cycle times and limited turret indexes.
- Precise insert positioning for accurate machining.
- Double-V shape aiding in operator-friendly insert indexing and optimum insert positioning.
- Choice of integral modular holders.



CM Cut-Off Medium



P M K N S H

CM-W Cut-Off Medium with Wiper



P M K N S H

PT Plunge, Groove, and Turn Inserts



P M K N S H

PC Grooving and Profiling Inserts



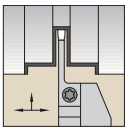
P M K N S H

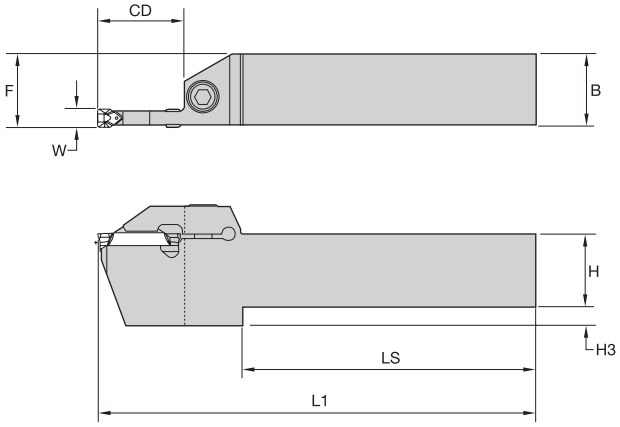
PH Plunge, Groove, and Turn Inserts

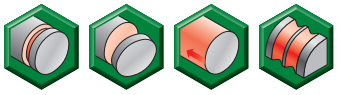


P M K N S H

Integral Toolholders • Metric







Right Hand Tool

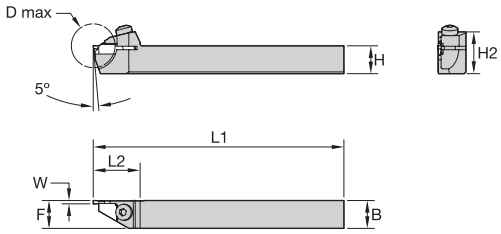
order number	catalogue number	SSC	W	H	B	CD	F	H3	L1	LS
right hand										
3650516	**WMTSR2525M116**	1	1,50	25,0	25,0	17	25,0	–	150	116
3539162	**WMTCR1212H213**	2	2,00	12,0	12,0	–	12,0	–	100	74
3650456	**WMTSR1616K216**	2	2,00	16,0	16,0	17	16,0	6	125	93
3650458	**WMTSR2020K216**	2	2,00	20,0	20,0	17	20,0	–	125	93
3650506	**WMTSR2525M216**	2	2,00	25,0	25,0	17	25,0	–	150	118
3650460	**WMTSR1616K311**	3	3,00	16,0	16,0	11	16,0	–	125	93
3650462	**WMTSR1616K322**	3	3,00	16,0	16,0	22	16,0	5	125	85
3650468	**WMTSR2020K311**	3	3,00	20,0	20,0	11	20,0	–	125	93
3650470	**WMTSR2020K322**	3	3,00	20,0	20,0	22	20,0	5	125	85
3650479	**WMTSR2525M311**	3	3,00	25,0	25,0	11	25,0	–	150	118
3650481	**WMTSR2525M322**	3	3,00	25,0	25,0	22	25,0	–	150	110
3653751	**WMTSR2020K20**	4	4,00	20,0	20,0	20	20,0	5	125	83
3650504	**WMTSR2020K411**	4	4,00	20,0	20,0	11	20,0	–	125	92
3653752	**WMTSR2525M411**	4	4,00	25,0	25,0	11	25,0	–	150	117
3650483	**WMTSR2525M422**	4	4,00	25,0	25,0	22	25,0	–	150	109
3650473	**WMTSR2020K514**	5	5,00	20,0	20,0	14	20,0	–	125	88
3650475	**WMTSR2020L525**	5	5,00	20,0	20,0	25	20,0	5	140	93
3650485	**WMTSR2525M514**	5	5,00	25,0	25,0	14	25,0	–	150	115
3650487	**WMTSR2525M525**	5	5,00	25,0	25,0	25	25,0	–	150	104
3650489	**WMTSR2525M614**	6	6,00	25,0	25,0	14	25,0	–	150	113
3650491	**WMTSR2525M625**	6	6,00	25,0	25,0	25	25,0	–	150	104
left hand										
3539163	**WMTCL1212H213**	2	2,00	12,0	12,0	–	12,0	–	100	74
3650457	**WMTSL1616K216**	2	2,00	16,0	16,0	17	16,0	6	125	93
3650459	**WMTSL2020K216**	2	2,00	20,0	20,0	17	20,0	–	125	93
3650507	**WMTSL2525M216**	2	2,00	25,0	25,0	17	25,0	–	150	118
3650463	**WMTSL1616K322**	3	3,00	16,0	16,0	22	16,0	5	125	85
3650469	**WMTSL2020K311**	3	3,00	20,0	20,0	11	20,0	–	125	93
3650471	**WMTSL2020K322**	3	3,00	20,0	20,0	22	20,0	5	125	85
3650480	**WMTSL2525M311**	3	3,00	25,0	25,0	11	25,0	–	150	118
3650482	**WMTSL2525M322**	3	3,00	25,0	25,0	22	25,0	–	150	110
3653763	**WMTSL2525M411**	4	4,00	25,0	25,0	11	25,0	–	150	117
3650484	**WMTSL2525M422**	4	4,00	25,0	25,0	22	25,0	–	150	109
3650474	**WMTSL2020K514**	5	5,00	20,0	20,0	14	20,0	–	125	88
3650486	**WMTSL2525M514**	5	5,00	25,0	25,0	14	25,0	–	150	113
3650488	**WMTSL2525M525**	5	5,00	25,0	25,0	25	25,0	–	150	104
3650490	**WMTSL2525M614**	6	6,00	25,0	25,0	14	25,0	–	150	114
3650493	**WMTSL2525M625**	6	6,00	25,0	25,0	25	25,0	–	150	104

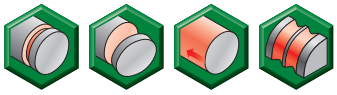
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

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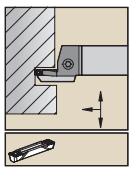


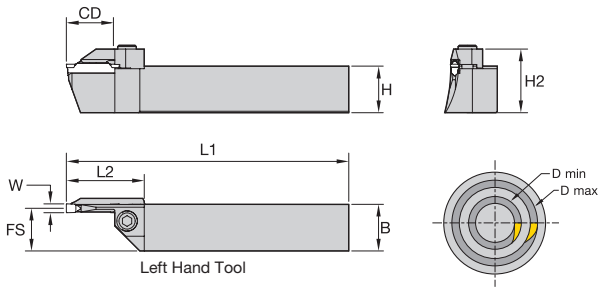


order number	catalogue number	SSC	W	H	B	F	D max	H2	L1	L2
right hand										
3650508	WMTCR1010H110	1	1,50	10,0	10,0	10,0	20	16	100	21
3650510	WMTCR1212H110	1	1,50	12,0	12,0	12,0	20	18	100	21
3650512	WMTCR1616K113	1	1,50	16,0	15,9	16,0	26	24	125	24
3653413	WMTCR1010H210	2	2,00	10,0	10,0	10,0	20	16	100	21
3653415	WMTCR1212H210	2	2,00	12,0	12,0	12,0	20	18	100	21
3653417	WMTCR1616K213	2	2,00	16,0	15,8	16,0	26	24	125	24
left hand										
3650509	WMTCL1010H110	1	1,50	10,0	10,0	10,0	20	16	100	21
3650511	WMTCL1212H110	1	1,50	12,0	12,0	12,0	20	18	100	21
3650513	WMTCL1616K113	1	1,50	16,0	15,9	16,0	26	24	125	24
3653414	WMTCL1010H210	2	2,00	10,0	10,0	10,0	20	16	100	21
3653416	WMTCL1212H210	2	2,00	12,0	12,0	12,0	20	18	100	21
3653418	WMTCL1616K213	2	2,00	16,0	15,8	16,0	26	24	125	24

NOTE: Insert exterior edge in line with toolholder edge for 10mm and 12mm shank toolholders.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Integral Toolholders for Face Grooving • Curve Out • Metric



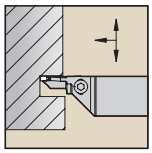


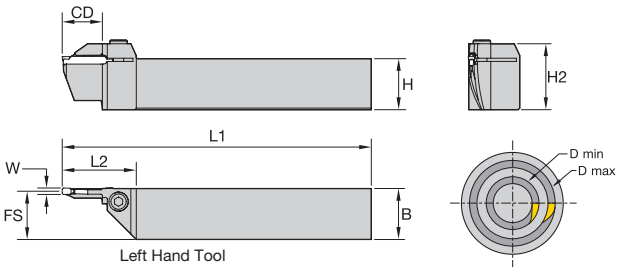


order number	catalogue number	SSC	W	H	B	FS	CD	D max	D min	H2	L1	L2
right hand												
3653421	WMTBR2525M313-038-052	3	3,00	24,8	24,8	23,5	13	52	38	32	150	34
3653423	WMTBR2525M316-052-070	3	3,00	24,8	24,8	23,5	16	70	52	32	150	34
3653425	WMTBR2525M316-070-100	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34
3653427	WMTBR2525M319-100-205	3	3,00	25,0	24,8	23,5	19	205	100	32	150	37
3653764	WMTBR2525M412-032-052	4	4,00	24,8	24,8	23,0	13	52	32	32	150	34
3653766	WMTBR2525M415-052-070	4	4,00	24,8	24,8	23,0	16	70	52	32	150	34
left hand												
3653422	WMTBL2525M313-038-052	3	3,00	24,8	24,8	23,5	13	52	38	32	150	34
3653424	WMTBL2525M316-052-070	3	3,00	24,8	24,8	23,5	16	70	52	32	150	34
3653426	WMTBL2525M316-070-100	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34
3653428	WMTBL2525M319-100-205	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37
3653771	WMTBL2525M418-100-205	4	4,00	24,8	24,8	23,0	19	205	100	32	150	37

NOTE: Insert cutting edge for WMT Face Grooving system is positioned +0,75mm above centre.
The WMT Face Grooving system is not designed to cut diameters of less than 12,6mm.
Toolholders that accept 3mm width inserts have an integral clamp.
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Integral Toolholders for Face Grooving • Curve In • Metric



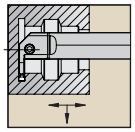


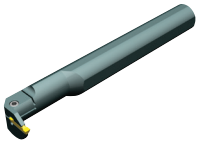
Left Hand Tool

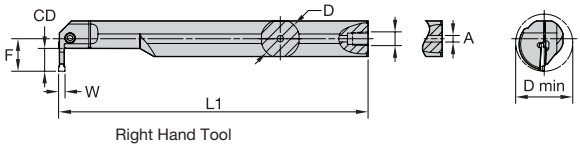
order number	catalogue number	SSC	W	H	B	FS	CD	D max	D min	H2	L1	L2
right hand												
3634282	**WMTAR2525M316-070-100**	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34
3634284	**WMTAR2525M319-100-205**	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37
left hand												
3634285	**WMTAL2525M319-100-205**	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37

NOTE: Insert cutting edge for WMT Face Grooving system is positioned +0,75mm above centre.
The WMT Face Grooving system is not designed to cut diameters of less than 12,6mm.
Toolholders that accept 3mm width inserts have an integral clamp.
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

Integral I.D. Grooving Boring Bars • Metric




Right Hand Tool



Right Hand Tool

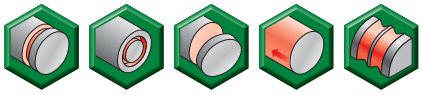
order number	catalogue number	SSC	W	F	CD	D	D min	L1	A
right hand									
5423874	**A25RWMTER0316M**	3	3,00	26,0	16	25,00	41	200	6,40
5423875	**A32SWMTER0319M**	3	3,00	29,0	19	32,00	47	250	6,40
5423876	**A25RWMTER0416M**	4	4,00	26,0	16	25,00	41	200	6,40
5423877	**A32SWMTER0419M**	4	4,00	29,0	19	32,00	47	250	6,40
5423878	**A32SWMTER0519M**	5	5,00	29,0	19	32,00	47	250	6,40
left hand									
5423882	**A25RWMTEL0316M**	3	3,00	26,0	16	25,00	41	200	6,40
5423883	**A32SWMTEL0319M**	3	3,00	29,0	19	32,00	47	250	6,40
5423884	**A25RWMTEL0416M**	4	4,00	26,0	16	25,00	41	200	6,40
5423885	**A32SWMTEL0419M**	4	4,00	29,0	19	32,00	47	250	6,40
5423886	**A32SWMTEL0519M**	5	5,00	29,0	19	32,00	47	250	6,40

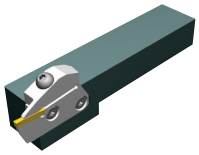
NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

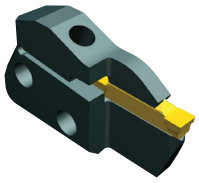
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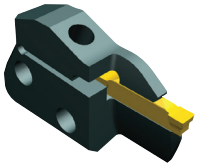
Modular Toolholders • Metric

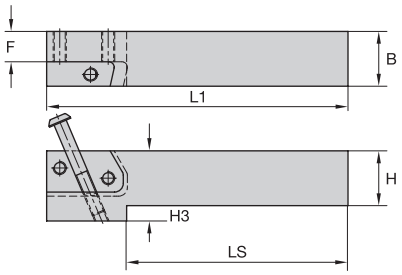




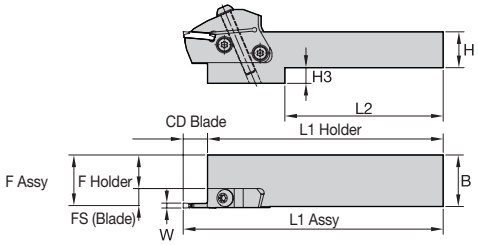








Right Hand Tool
2 blade screws required

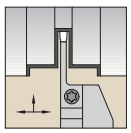


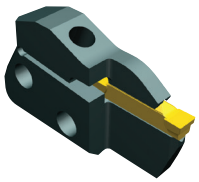
F Assy = F (Holder) + FS (Blade) + W/2
L1 Assy = L1 (Holder) + CD (Blade)

order number	catalogue number	H	B	L1	LS	F	H3
right hand							
5349629	**WGMSR2525**	25	25	126,0	95,78	13,84	7

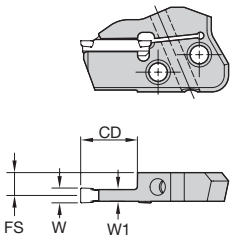
NOTE: Use the larger seat size toolholder for optimal performance.

Modular Blades • Metric



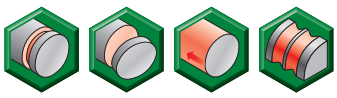


Right Hand Blade



Right Hand Blade

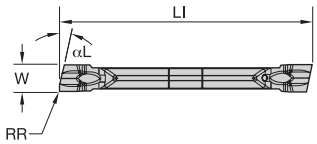




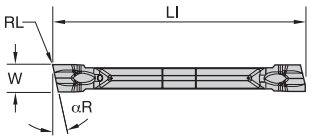
order number	catalogue number	SSC	CD	W	FS	W1
right hand						
5359130	**WMTWGMR319S**	3	19,00	3,00	10,38	2,54
5359131	**WMTWGMR419S**	4	19,00	4,00	10,00	3,30

NOTE: Blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.).
SSC = Pocket Seat Reference. To correspond with the SSC on the toolholder.

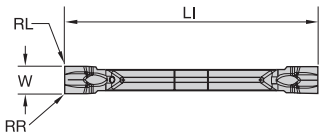
Cut-Off Inserts • WMT-CM



Left Hand



Right Hand



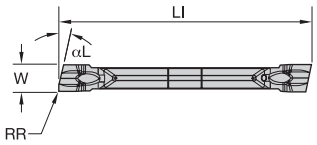
Neutral
RR = RL *on neutral inserts*

● first choice
○ alternate choice

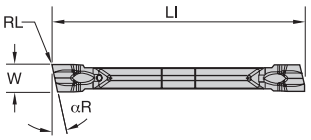
P		○
M		●
K		○
N		●
S		●
H		

catalogue number	SSC	W	RR	RL	LI	αR	αL	hand	WU25PT
WMTC015R05CM08	1	1,50	0,08	0,08	19,31	5	–	R - Right	**4169670**
WMTC015R12CM08	1	1,50	0,08	0,08	19,28	12	–	R - Right	**4169672**
WMTC020R05CM08	2	1,99	0,08	0,08	19,21	5	–	R - Right	**4169675**
WMTC020R12CM08	2	2,00	0,08	0,08	19,26	12	–	R - Right	**4169678**
WMTC030R05CM17	3	3,00	0,17	0,17	25,40	5	–	R - Right	**4169684**
WMTC030R12CM17	3	3,00	0,17	0,17	25,40	12	–	R - Right	**4169688**
WMTC040R05CM17	4	4,00	0,17	0,17	25,40	5	–	R - Right	**4169694**
WMTC040R12CM17	4	4,00	0,17	0,17	25,40	12	–	R - Right	**4169696**
WMTC015N00CM08	1	1,50	0,08	0,08	19,30	–	–	N - Neutral	**4169668**
WMTC020N00CM08	2	2,00	0,08	0,08	19,21	–	–	N - Neutral	**4169673**
WMTC030N00CM17	3	3,00	0,17	0,17	25,40	–	–	N - Neutral	**4169682**
WMTC040N00CM17	4	4,00	0,17	0,17	25,40	–	–	N - Neutral	**4169692**
WMTC015L05CM08	1	1,50	0,08	0,08	19,31	–	5	L - Left	**4169671**
WMTC020L05CM08	2	1,99	0,08	0,08	19,21	–	5	L - Left	**4169677**
WMTC020L12CM08	2	2,00	0,08	0,08	19,25	–	12	L - Left	**4169680**
WMTC030L05CM17	3	3,00	0,17	0,17	25,40	–	5	L - Left	**4169686**
WMTC030L12CM17	3	3,00	0,17	0,17	25,40	–	12	L - Left	**4169690**

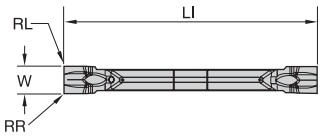
Cut-Off Inserts with Wiper • WMT-CM-W



Left Hand



Right Hand



Neutral
RR = RL *on neutral inserts*

● first choice
○ alternate choice

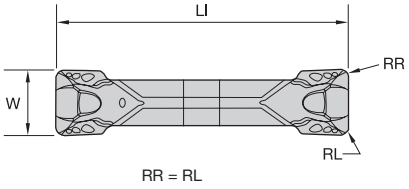
P		○
M		●
K		○
N		●
S		●
H		

catalogue number	SSC	W	RR	RL	LI	αR	αL	hand	WU25PT
WMTC020R05CMW08	2	2,00	0,08	0,08	19,20	5	–	R - Right	**4169676**
WMTC020R12CMW08	2	2,00	0,08	0,08	19,27	12	–	R - Right	**4169679**
WMTC030R05CMW17	3	3,00	0,17	0,17	25,40	5	–	R - Right	**4169685**
WMTC030R12CMW17	3	3,00	0,17	0,17	25,40	12	–	R - Right	**4169689**
WMTC015N00CMW08	1	1,50	0,08	0,08	19,30	–	–	N - Neutral	**4169669**
WMTC020N00CMW08	2	2,00	0,08	0,08	19,21	–	–	N - Neutral	**4169674**
WMTC030N00CMW17	3	3,00	0,17	0,17	25,40	–	–	N - Neutral	**4169683**
WMTC040N00CMW17	4	4,00	0,17	0,17	25,40	–	–	N - Neutral	**4169693**
WMTC020L12CMW08	2	2,00	0,08	0,08	19,27	–	12	L - Left	**4169681**
WMTC030L05CMW17	3	3,00	0,17	0,17	25,40	–	5	L - Left	**4169687**
WMTC030L12CMW17	3	3,00	0,17	0,17	25,40	–	12	L - Left	**4169691**

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

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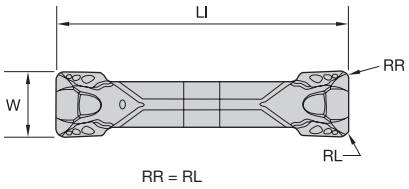
● first choice
○ alternate choice

		WP10CT	WP25CT	WU10PT	WU25PT
P		●	●	○	○
M				●	●
K		●	●	○	○
N				●	●
S				●	●
H				○	

catalogue number	SSC	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT
WMTS205M2U02PT	2	2,13	0,15	19,23	4169554	4169555	4116131	4116132
WMTS305M3U03PT	3	3,13	0,31	25,81	4169556	4169557	4113568	4113569
WMTS305M3U06PT	3	3,13	0,61	25,78	4169558	4169559	4113570	4113571
WMTS405M4U03PT	4	4,13	0,31	25,53	4169560	4169561	4113577	4113578
WMTS405M4U06PT	4	4,13	0,61	25,53	4169562	4169563	4113579	4113580
WMTS505M5U03PT	5	5,13	0,30	28,76	4169564	4169565	4116148	4116149
WMTS505M5U06PT	5	5,13	0,61	28,76	4169566	4169567	4116150	4116151
WMTS605M6U03PT	6	6,13	0,30	28,76	4169568	4169569	4117253	4117254
WMTS605M6U06PT	6	6,13	0,59	28,76	4169570	4169571	4117255	4117256

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

Grooving and Turning Inserts • WMT-P-PT • Precision



● first choice
○ alternate choice

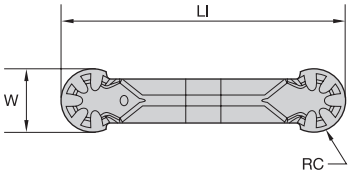
		WU10PT	WU25PT	WU10HT
P		○	○	
M		●	●	○
K		○	○	
N		●	●	●
S		●	●	●
H		○		

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WU10HT
WMTS200M2P02PT	2	2,00	0,15	19,10	4116129	4116130	–
WMTS300M3P03PT	3	3,00	0,31	25,65	4113563	4113564	4113566
WMTS300M3P06PT	3	3,00	0,61	25,65	4113565	4113567	–
WMTS400M4P03PT	4	4,00	0,31	25,40	4113572	4113574	4113573
WMTS400M4P06PT	4	4,00	0,60	25,40	4113575	4113576	–
WMTS500M5P03PT	5	5,00	0,30	28,63	4116143	4116144	4116145
WMTS500M5P06PT	5	5,00	0,61	28,63	4116146	4116147	–
WMTS600M6P03PT	6	6,00	0,30	28,63	4117239	4117240	–
WMTS600M6P06PT	6	6,00	0,58	28,63	4117241	4117242	–
WMTS800M8P06PT	8	8,00	0,61	28,57	–	4117258	–
WMTS800M8P15PT	8	8,00	1,50	28,57	4117259	4117260	–

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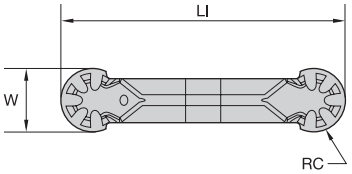
● first choice
○ alternate choice

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

catalogue number	SSC	W	RC	LI	WP10CT	WU10PT	WU25PT
WMTR305M3UPC	3	3,13	1,53	25,53	–	**4170172**	**4170173**
WMTR405M4UPC	4	4,13	2,03	25,58	–	**4170177**	**4170178**
WMTR505M5UPC	5	5,13	2,53	29,01	–	**4170182**	**4170183**
WMTR605M6UPC	6	6,12	3,03	28,77	**4170189**	**4170187**	**4170188**
WMTR805M8UPC	8	8,13	4,03	29,22	–	**4170192**	**4170193**

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

Plunge and Contour Inserts • WMT-P-PC • Precision



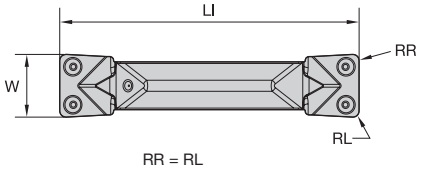
● first choice
○ alternate choice

P	○	○
M	●	●
K	○	○
N	●	●
S	●	●
H	○	

catalogue number	SSC	W	RC	LI	WU10PT	WU25PT
WMTR300M3PPC	3	3,00	1,50	25,40	**4170170**	**4170171**
WMTR400M4PPC	4	4,00	2,00	25,45	–	**4170176**
WMTR500M5PPC	5	5,00	2,50	28,88	**4170180**	**4170181**
WMTR600M6PPC	6	6,00	3,00	28,65	**4170185**	**4170186**
WMTR800M8PPC	8	8,00	4,00	29,08	**4170190**	–

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

Grooving and Turning Inserts • WMT-U-PH • Moulded



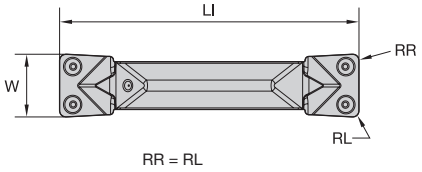
● first choice
○ alternate choice

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

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT
WMTS305M3U03PH	3	3,13	0,30	25,81	5346392	5346393
WMTS305M3U06PH	3	3,13	0,60	25,81	5346394	5346395
WMTS405M4U03PH	4	4,13	0,30	25,53	5346396	5346397
WMTS405M4U06PH	4	4,13	0,60	25,53	5346398	5346399
WMTS505M5U03PH	5	5,13	0,30	28,76	5346400	5346401
WMTS505M5U06PH	5	5,13	0,60	28,76	5346402	5346403
WMTS605M6U03PH	6	6,13	0,30	28,76	5346404	5346405
WMTS605M6U06PH	6	6,13	0,60	28,76	5346406	5346407

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

Grooving and Turning Inserts • WMT-P-PH • Precision



● first choice
○ alternate choice

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

catalogue number	SSC	W	RR	LI	WU10PT	WU25PT	WU10HT
WMTS300M3P03PH	3	3,00	0,30	25,65	5346412	5346413	5346414
WMTS300M3P06PH	3	3,00	0,60	25,65	5346415	5346416	–
WMTS400M4P03PH	4	4,00	0,30	25,40	5346418	5346419	5346420
WMTS400M4P06PH	4	4,00	0,60	25,40	5346421	5346422	–
WMTS500M5P03PH	5	5,00	0,30	28,63	–	5346425	5346426
WMTS500M5P06PH	5	5,00	0,60	28,63	5346427	5346428	–
WMTS600M6P03PH	6	6,00	0,30	28,63	5346430	5346431	–
WMTS600M6P06PH	6	6,00	0,60	28,63	5346432	5346433	–

NOTE: SSC = Pocket Seat Reference. To correspond with the SSC on the insert.

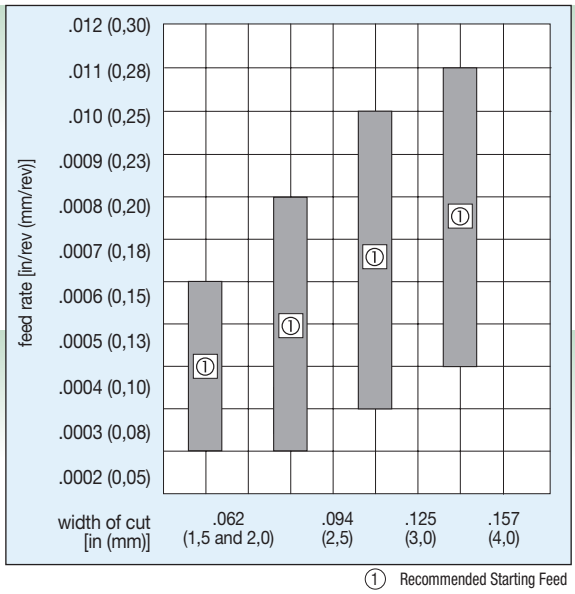
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Feed Values for Grooving Inserts

CM Cut-Off Medium



- Double-ended, V-bottom and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12°.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimised cutting pressure on various materials.
- Ideal for 300 Series stainless steel, tool steel, titanium, INCONEL®, and other nickel-based alloys at moderate speeds and feeds.



CM-W Cut-Off Medium with Wiper

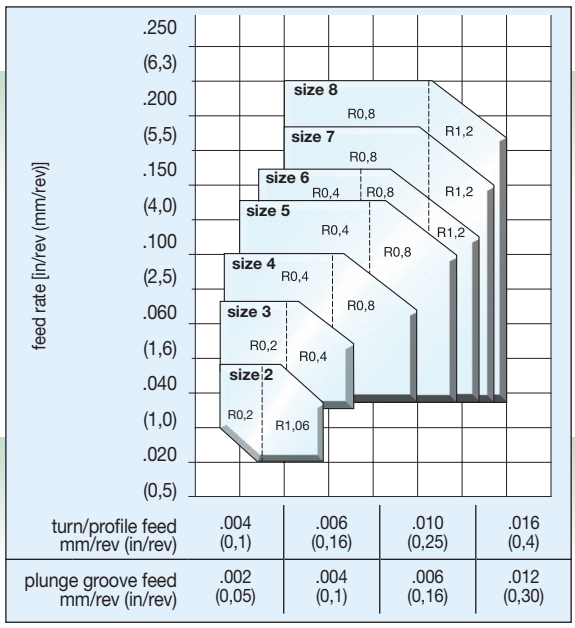


- Wiper flats where surface finish is critical.
- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12°.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimised cutting pressure on various materials.

PT Plunge, Groove, and Turn Inserts



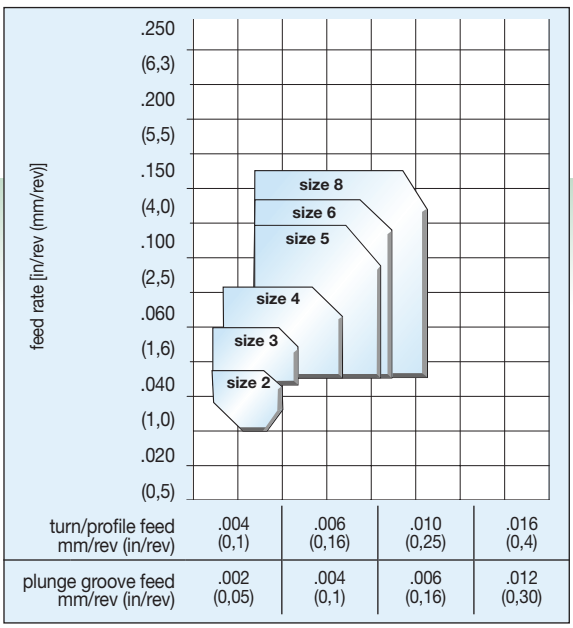
- High positive rake geometry for low cutting force, especially in soft materials.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Cuts in both axial and radial directions.



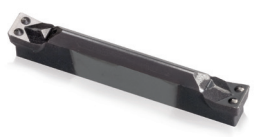
PC Grooving and Profiling Inserts



- Superior chip control.
- Full nose radius geometry for plunge and contour operations.
- Effective cutting edge geometry exceeds 180° for increased versatility.



PH Plunge, Groove, and Turn Inserts



- Excellent performance in greater than 35 HRC.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Delivers superior chip control in interrupted cuts.

Recommended Cutting Speeds • Metric

Material Group		Cutting Speed – vc m/min														
		WU10HT			WU10PT			WU25PT			WP10CT			WP25CT		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	100	**100**	110	190	**200**	210	170	**175**	180	210	**225**	240	170	**175**	180
	2	95	**95**	105	180	**185**	190	150	**160**	170	210	**220**	230	185	**195**	205
	3	95	**95**	105	180	**185**	190	150	**160**	170	210	**220**	230	185	**195**	205
	4	70	**70**	75	165	**170**	175	135	**145**	155	140	**145**	155	125	**125**	135
	5	85	**90**	95	170	**175**	180	140	**150**	160	180	**190**	195	155	**165**	170
	6	50	**50**	50	140	**150**	160	120	**125**	130	70	**75**	80	70	**75**	80
M	1	70	**75**	80	120	**125**	130	120	**125**	130	–	**–**	–	–	**–**	–
	2	50	**50**	50	100	**100**	110	70	**75**	80	–	**–**	–	–	**–**	–
	3	50	**50**	50	95	**100**	105	85	**90**	95	–	**–**	–	–	**–**	–
K	1	85	**90**	95	190	**200**	210	155	**165**	170	215	**225**	235	180	**190**	195
	2	75	**75**	80	185	**190**	200	155	**165**	175	205	**215**	225	175	**185**	195
	3	70	**75**	80	170	**175**	180	140	**150**	160	210	**225**	240	190	**200**	210
N	1	70	**75**	80	140	**150**	160	110	**120**	130	–	**–**	–	–	**–**	–
	2	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	3	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	4	70	**75**	80	140	**150**	80	110	**120**	80	–	–	–	–	–	–
	5	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	6	70	**75**	80	140	**150**	80	110	**120**	80	–	**–**	–	–	**–**	–
	7	70	**75**	80	140	**150**	120	110	**120**	105	–	**–**	–	–	**–**	–
S	1	20	**25**	30	70	**75**	80	60	**65**	65	–	**–**	–	–	**–**	–
	2	20	**25**	30	65	**65**	70	50	**50**	50	–	**–**	–	–	**–**	–
	3	50	**50**	50	100	**100**	110	70	**75**	80	–	**–**	–	–	**–**	–
	4	–	**–**	–	70	**75**	80	50	**50**	50	–	**–**	–	–	**–**	–
H	1	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–
	2	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–
	3	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–
	4	–	**–**	–	15	**30**	60	15	**30**	60	–	**–**	–	–	**–**	–

Indexable Milling Icons

	Counterboring		Spiral Circular		Face Milling		Helical Milling		Plunge Milling
	Ramping Blank		Slotting: Ball Nose		Side Milling/ Shoulder Milling: Ball Nose		Side Milling/ Shoulder Milling: Square End		Chamfer Milling
	Side Milling: Roughing		3D Profiling		3D Profiling: Inclined Square End Mill		Pocketing		Plain Shank
	Weldon® Shank		Weldon Shank: 2 Flat		Screw-On Shank		Shell Mill Shank		Through Coolant: Radial: Indexable Milling

Solid End Millling Icons

	Plunge Milling		Ramping Blank		Slotting: Ball Nose		Slotting: Ball Nose with AP Dimension		Slotting: Square End
	Slotting: Square End with AP Dimension		Trochoidal Milling		Trochoidal Milling: Ball Nose		Side Milling: Shoulder Milling: Ball Nose		Side Milling/ Shoulder Milling: Ball Nose with AE/AP Dimension
	Side Milling/ Shoulder Milling: Square End		Side Milling/ Shoulder Milling: Square End with AE/AP Dimension		3D Profiling		3D Profiling: 3D Profiling with AE/AP Dimensions		Corner Style: Ball Nose
	Corner Style: Corner Chamfer		Corner Style: Corner Radius		Corner Style: Square End		Corner Style: Torus		Cylindrical/Plain Shank
	Shank: Cylindrical Weldon®		Shank: Safe–Lock™		Helix Angle: 20°		Helix Angle: 30°		Helix Angle: 35°
	Helix Angle: 37°		Helix Angle: 38°		Helix Angle: 43°		Helix Angle: 45°		DIN Number 6527
	DIN Number 6528		Tool Dimensions: Flute Configuration: X (Variable)		Tool Dimensions: Flute Configuration: 2		Tool Dimensions: Flute Configuration: 3		Tool Dimensions: Flute Configuration: 4
	Tool Dimensions: Flute Configuration: 5		Tool Dimensions: Flute Configuration: 6		Tool Dimensions: Flute Configuration: 7		Manufacturer's Specs: JIS		

Holemaking Icons

	Drilling		Drilling: Inclined Entry		Drilling: Inclined Exit		Drilling: Exit Offset		Drilling: Stacked Plates
	Drilling: Convex		Drilled Hole		Chain Drilling		Drilling: Cross Hole		Drilling: Half Cylinder
	Drilling: Corner Drilling 45°		Drilling Depth: 3x		Drilling Depth: 4x		Drilling Depth: 5x		Drilling Depth: 8x
	Drilling Depth: 12x		Drilling Depth: 30x		Shank: Cylindrical Plain ≤h6		Shank: Cylindrical with Flat		Flat Shank
	Helix Angle 30°		DIN Number 6537		DIN Number 6535		Through Coolant: Radial: Drilling		Flood Coolant: Drilling
	Through Coolant: Radial: Indexable Drilling		Tool Dimensions: 2-Flute/2-Margin/ Coolant		Tool Dimensions: 2-Flute/4-Margin/ Coolant				

Tapping Icons

	Reaming: Through Hole		Reaming: Blind Hole		Threading: Through Hole		Tapping: Blind Hole		HSS-E: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness
	Chamfer Form B (3.5–5.5)		Chamfer Form B (2–3)		Chamfer Form C (1.5–2)		Chamfer Form C (3–5)		Tapping Helix: Angle: 0°
	Tapping Helix: Angle: 42°		Tapping Helix: Angle: 45°		Multipurpose Taps: Spiral Point	TC	Tension/ Compression	DIN 371	DIN Number 371
DIN 374	DIN Number 374	DIN 376	DIN Number 376	DIN 5156	DIN Number 5156		Flood Coolant: Tapping	2B	Class of Fit: 2B
6H	Class of Fit: 6H	6G	Class of Fit: 6G	UNF	Unified Fine Thread	UNC	Unified Course Thread	NPT	American Tapered Pipe Thread for Threads with Dryseal Material
NPTF	Manufacturer's Specs: NPTF	G	Manufacturer's Specs: G	M	ISO Metric Coarse Thread	MF	ISO Metric Fine Thread		

Turning Icons

	Through Coolant: Grooving		Turning		Profiling		Facing		Face Grooving
	Chamfering		Back Boring		Grooving		Cut-Off		I.D. Turning
	I.D. Chamfering		I.D. Grooving		O.D. Deep Grooving				

DIN

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

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	–
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Austenitic Stainless Steel	–	<600	130–200	–	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	–	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Grey Cast Iron	–	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	GGG40, GTS35
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Wrought Aluminium	–	–	–	–	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMg-SiPb
N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	–	–	–	GAlSiCu4, GDAlSi10Mg
N3	High-Silicon Aluminium Alloys and Magnesium Alloys	Si >12,2%	–	–	–	G-ALSi12, G-AlSi17Cu4, G-AlSi21CuNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass	–	–	–	–	Lexan®, Hostalen™, Polystyrol, Makralon
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	CFK, GFK
N7	Metal Matrix Composites (MMC)	–	–	–	–	–
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 188, Stellite® 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, Nimonic® 75
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Hardened Materials	–	–	–	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Hardox® 400
H2	Hardened Materials	–	–	–	48–55	–
H3	Hardened Materials	–	–	–	56–60	–
H4	Hardened Materials	–	–	–	>60	–

Notes

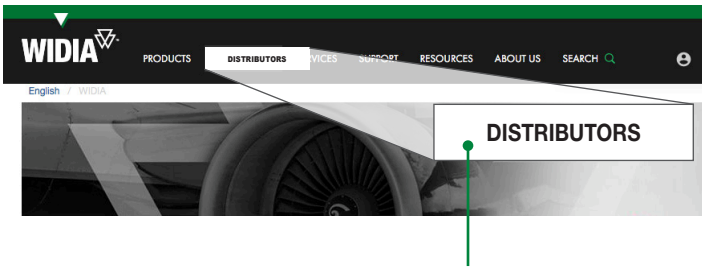
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IMPORTANT SAFETY INSTRUCTIONS: READ BEFORE USING THE TOOLS IN THIS CATALOGUE

METALCUTTING SAFETY

Projectile and Fragmentation Hazards

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles. Breathing this dust or mist — especially over an extended period — can cause temporary or permanent lung disease or make existing medical conditions worse. Contact with this dust or mist can irritate eyes, skin, and mucous membranes and may make existing skin conditions worse.

To avoid injury:

- Always wear breathing protection and safety goggles when grinding.
- Provide ventilation control and collect and properly dispose of dust, mist, or sludge from grinding.
- Avoid skin contact with dust or mist.

For more information, read the applicable Material Safety Data Sheet provided by WIDIA and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations.

These safety instructions are general guidelines. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalogue and recommendations on machining practices may not apply to your particular operation.

For more information, consult the WIDIA Metalcutting Safety booklet, available free from WIDIA at +1 724 539 5747 or fax +1 724 539 5439. For specific product safety and environmental questions, contact our Corporate Environmental Health and Safety Office at +1 724 539 5066 or fax +1 724 539 5372.

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