



2017 Master Catalog

WIDIA  TM



Indexable Milling • Face Mills

M1200 Mini • First Choice for Taper 40 Spindle Machines	H2–H21
M1200 • First Choice for Taper 50 Spindle Machines.....	H22–H39
M640 • High Positive Geometries for Low-Power Machines.....	H40–H47
M660 • Heavy-Duty Applications	H48–H55
SuperFeed • PCD Face Milling & End Milling Platform.....	H56–H62
M4000 • Flexible Cartridge Milling System	H64–H68



One Series Meets Every Face Milling Need •

WIDIA™ Victory™ M1200 Mini

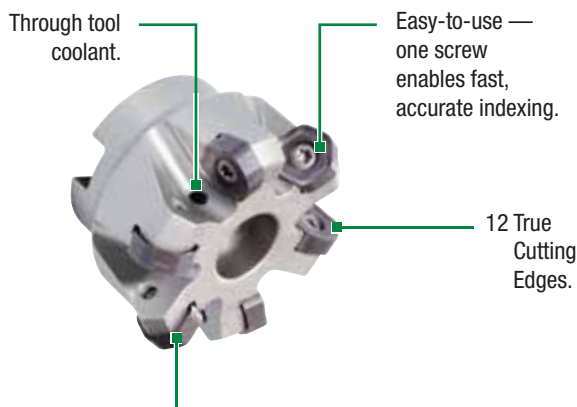
For consistent performance, look no further than the WIDIA Victory™ M1200 Mini. This easy-to-use product ensures great tool life, reduced machining time, and maximum productivity.

M1200 Mini



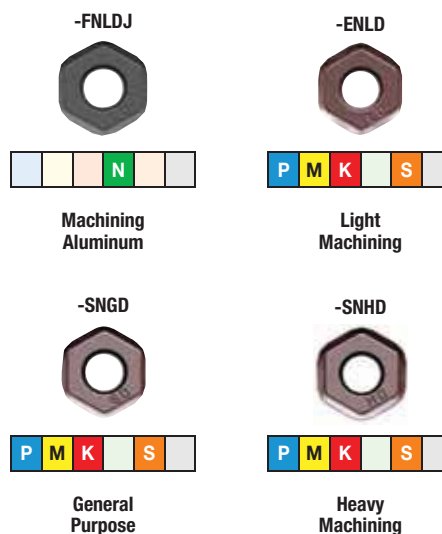
- Low cost per edge and high productivity.
- Reduced cutting forces due to soft cutting action.
- Significantly increased Metal Removal Rates (MRR).
- Victory™ M1200 Mini available in 75°, 45°, and 31° lead.
- WIDIA premium milling grades.
- Excellent tool life in light to heavy machining.
- Shorter machining cycle times.

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



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

Latest soft cutting edge insert design for all material groups



Face Mills

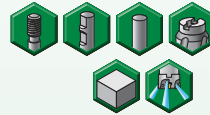


Victory™ M1200 Mini HF 75°

Max depth of cut: .068"

Lead angle: 75°
Indexes per insert: 12
Diameter: 1–3"

Pages: H5–H9

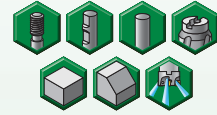
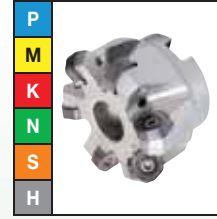


Victory™ M1200 Mini 45°

Max depth of cut: .138"

Lead angle: 45°
Indexes per insert: 12
Diameter: 1–5"

Pages: H10–H17

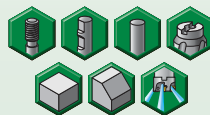


Victory™ M1200 Mini HD 31°

Max depth of cut: .185"

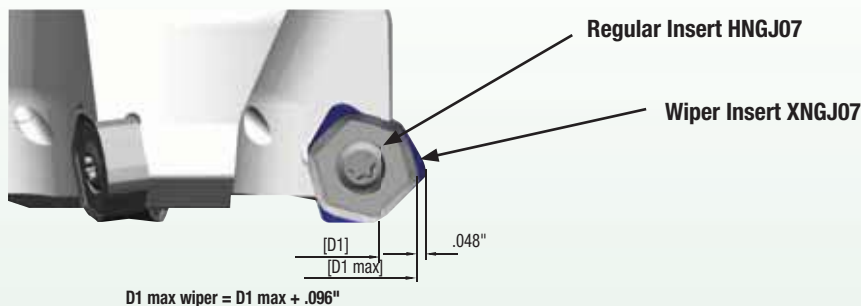
Lead angle: 31°
Indexes per insert: 12
Diameter: 1.5–5"

Pages: H18–H21



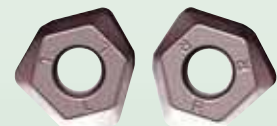
■ Easy-to-use wiper insert setup to achieve excellent surface floor finish

Wiper insert overlapping vs. regular insert



- Wiper inserts only applied with 45° lead angle cutter bodies.
- Easy to use. Regular and wiper inserts are loaded into fixed pockets. No adjustment required.
- Please have D1 max wiper in mind in case of limited working area.
- Use wiper inserts only in combination with periphery ground regular inserts HNGJ07.

- Up to cutting diameter D1=4" load one wiper insert.
- For cutting diameter D1=5" and above load two wiper inserts.
- Each wiper insert XNGJ07 can be applied with three right hand R and three left hand L cutting edges.



Victory™ M1200 Mini Series

Victory™ M1200 Mini HF High-Feed 75°

12 True
Cutting
Edges



Insert HNGJ0704
HNPJ0704

Ap1 max = .068"

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

Victory™ M1200 Mini HF High-Feed



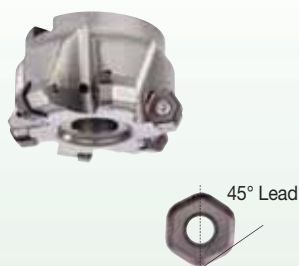
First choice for long reach face milling applications or light fixtures.

The 75° lead angle thins the chip and allows higher feed rates and MRR.

Up to 40% shorter machining cycle time.

Victory™ M1200 Mini 45°

12 True
Cutting
Edges



Insert HNGJ0704
HNPJ0704

Ap1 max = .138"

Best-in-class leader in face milling up to Ap1 max = .138". Excellent choice for near net shape strategies and driven tools.

Victory™ M1200 Mini HD 31°

12 True
Cutting
Edges



Insert HNGJ0704
HNPJ0704

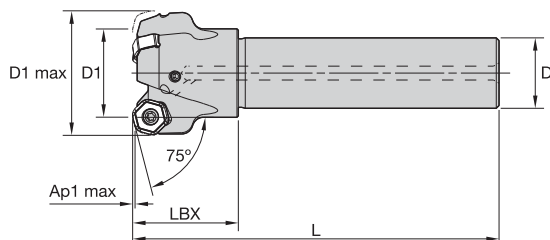
Ap1 max = .185"

Achieve a higher axial depth-of-cut capability up to Ap1 = .185" with standard M1200 Mini inserts.

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



Face Mills



■ Cylindrical Shanks

order number	catalog number	D1	D1 max	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	lbs
4136453	M1200HF100Z02C075HN07L480	1.000	1.556	.750	4.800	1.250	.068	2	19800	Yes	.73
4136454	M1200HF100Z03C075HN07L480	1.000	1.556	.750	4.800	1.250	.068	3	19800	Yes	.69
4136455	M1200HF125Z03C100HN07L520	1.250	1.807	1.000	5.200	1.500	.068	3	17700	Yes	1.28
4136456	M1200HF125Z04C100HN07L520	1.250	1.807	1.000	5.200	1.500	.068	4	17700	Yes	1.29

■ Spare Parts


 insert
screw


in. lbs.


 Torx
driver

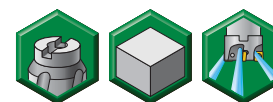
D1			
1.000	12146034500	31	12148082400
1.250	12146034500	31	12148082400

Face Mills • Victory™ M1200 Mini Series

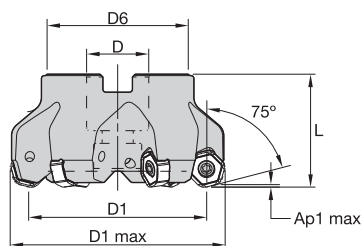
Victory M1200 Mini HF • Shell Mills



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



Face Mills



■ Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
4136457	M1200HF150Z05S050HN07	1.500	2.057	.750	1.440	1.575	.068	5	15800	Yes	.57
4136458	M1200HF200Z05S075HN07	2.000	2.557	.750	1.750	1.575	.068	5	12500	Yes	1.12
4136459	M1200HF250Z06S075HN07	2.500	3.056	.750	1.750	1.575	.068	6	10000	Yes	1.48
4136460	M1200HF300Z08S100HN07	3.000	3.556	1.000	2.189	1.750	.068	8	8300	Yes	2.32

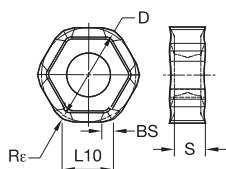
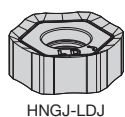
■ Spare Parts

D1	insert screw	in. lbs.	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove
1.500	12146034500	31	12148082400	S445	12146102400
2.000	12146034500	31	12148082400	S445	12146102400
2.500	12146034500	31	12148082400	S445	12146102400
3.000	12146034500	31	12148082400	S458	12146102800

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.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	—	—	—	—	—	—

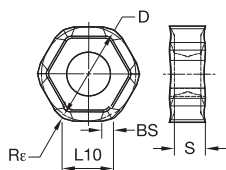
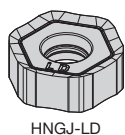


- first choice
- alternate choice

P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0704ANFNLDJ	12	.500	.268	.176	.064	.047	.003	3954414	3954332

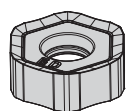


- first choice
- alternate choice

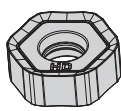
P			●	●	●	●	●	●	●
M			○	○	○	○	○	○	○
K	●	●	○	○	○	○	○	○	○
N									
S			●	●	●	●	○		
H							○		

HNGJ-LD

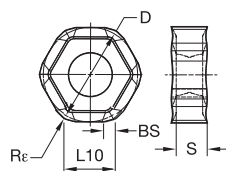
catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNGJ0704ANENLD	12	.500	.268	.176	.064	.047	.003	3954419	3954420	3954421	3954422	—	—	5895291	5895292	5528975	5550905
HNGJ070432ANENLD	12	.500	.268	.176	—	.126	.003	3954428	—	3954429	3954430	—	—	—	—	—	—



HNPJ-GD



HNPJ-HD



- first choice

☐ alternate choice

P									
M									
K									
N									
S									
H									

■ HNPJ-GD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WP30PM	WP40BM
HNPJ0704ANSNGD	12	.500	.269	.175	.050	.047	.004	3954432	3954473	-	3954474	3954475	5427374	5895293	5895294	5528876	550006

■ HNPJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNHD	12	.500	.269	.174	.049	.047	.006	3954477	3954478	-	3954479	3954480	5427375	5895295	5895296	-	5500007
HNPJ070432ANSNHD	12	.500	.269	.174	—	.126	.006	3954481	3954482	-	3954483	3954484	-	-	-	-	5500007

Recommended Starting Speeds

■ Recommended Starting Speeds [SFM]

[illegible]

(continued)

(Recommended Starting Speeds [SFM] — continued)

Material Group		WP25PM	WP35CM	WS30PM	WP40PM	TN6501	THM-U
P	1	1295 1120 1060	1790 1555 1460	— — —	1165 1025 965	— — —	— — —
	2	1080 940 785	1105 1000 905	— — —	985 845 710	— — —	— — —
	3	1000 845 690	1000 905 805	— — —	905 770 630	— — —	— — —
	4	890 725 590	750 690 630	— — —	805 670 535	— — —	— — —
	5	725 670 590	1025 905 830	— — —	670 610 535	— — —	— — —
	6	650 490 395	630 535 430	— — —	590 450 355	— — —	— — —
M	1	805 710 650	805 725 610	890 785 725	770 670 610	— — —	— — —
	2	725 630 510	725 630 550	805 710 570	690 590 490	— — —	— — —
	3	550 475 370	570 510 450	610 535 415	510 450 355	— — —	— — —
K	1	905 805 725	1165 1045 940	— — —	— — —	— — —	— — —
	2	710 630 590	925 830 750	— — —	— — —	— — —	— — —
	3	590 535 475	770 690 630	— — —	— — —	— — —	— — —
N	1	— — —	— — —	— — —	— — —	7870 4720 3935	7870 4720 3935
	2	— — —	— — —	— — —	— — —	5370 3210 2615	5370 3210 2615
	3	— — —	— — —	— — —	— — —	3150 1970 1570	3150 1970 1570
S	1	155 140 95	— — —	180 155 120	155 140 120	— — —	— — —
	2	155 140 95	— — —	180 155 120	155 140 120	— — —	— — —
	3	200 155 95	— — —	215 180 120	200 155 120	— — —	— — —
	4	275 200 140	260 200 130	335 235 155	260 200 140	— — —	— — —
H	1	475 355 275	— — —	— — —	— — —	— — —	— — —
	2	— — —	— — —	— — —	— — —	— — —	— — —
	3	— — —	— — —	— — —	— — —	— — —	— — —

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

Recommended Starting Feeds

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F.LDJ	.019	.035	.072	.014	.025	.051	.010	.019	.038	.009	.016	.033	.008	.015	.030	.F.LDJ
.E..LD	.019	.055	.112	.014	.039	.079	.010	.029	.058	.009	.025	.051	.008	.023	.046	.E..LD
.S..GD	.036	.093	.153	.026	.066	.106	.019	.049	.078	.017	.042	.068	.015	.039	.062	.S..GD
.S..HD	.036	.093	.153	.026	.066	.106	.019	.049	.078	.017	.042	.068	.015	.039	.062	.S..HD

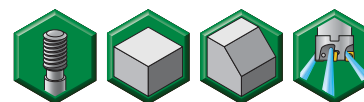
NOTE: Use "Light Machining" value as starting feed rate.

Face Mills • Victory™ M1200 Mini Series

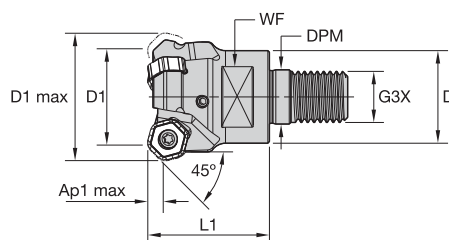
Victory M1200 Mini • Screw-On End Mills



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



Face Mills



Screw-On End Mills

order number	catalog number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z	max RPM	coolant supply	lbs
3953681	M1200D100Z02M16HN07	1.000	1.343	1.142	.669	M16	1.250	.864	.138	2	19800	Yes	.30
3953682	M1200D100Z03M16HN07	1.000	1.343	1.142	.669	M16	1.250	.864	.138	3	19800	Yes	.28
3953903	M1200D125Z03M16HN07	1.250	1.593	1.142	.669	M16	1.500	.864	.138	3	17600	Yes	.44
3953904	M1200D125Z04M16HN07	1.250	1.593	1.142	.669	M16	1.500	.864	.138	4	17600	Yes	.41
3953905	M1200D150Z04M16HN07	1.500	1.843	1.142	.669	M16	1.500	.864	.138	4	15800	Yes	.49
3953906	M1200D150Z05M16HN07	1.500	1.843	1.142	.669	M16	1.500	.864	.138	5	15800	Yes	.48

Spare Parts



insert
screw



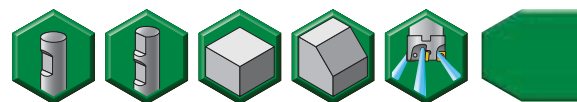
in. lbs.



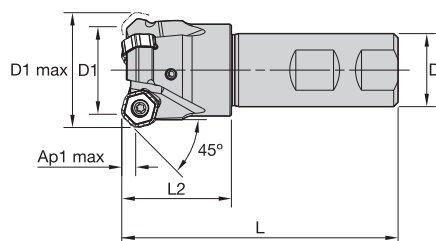
Torx
driver

D1	insert screw	in. lbs.	Torx driver
1.000	12146034500	31	12148082400
1.250	12146034500	31	12148082400
1.500	12146034500	31	12148082400

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



Face Mills



■ Weldon Shanks

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
3953893	M1200D100Z02W075HN07	1.000	1.343	.750	3.280	1.250	.138	2	19800	Yes	.46
3953894	M1200D100Z03W075HN07	1.000	1.343	.750	3.280	1.250	.138	3	19800	Yes	.44
3953895	M1200D125Z03W100HN07	1.250	1.593	1.000	3.783	1.500	.138	3	17700	Yes	.91
3953896	M1200D125Z04W100HN07	1.250	1.593	1.000	3.783	1.500	.138	4	17700	Yes	.88

■ Spare Parts



insert screw



in. lbs.



Torx driver

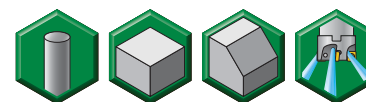
D1	insert screw	in. lbs.	Torx driver
1.000	12146034500	31	12148082400
1.250	12146034500	31	12148082400

Face Mills • Victory™ M1200 Mini Series

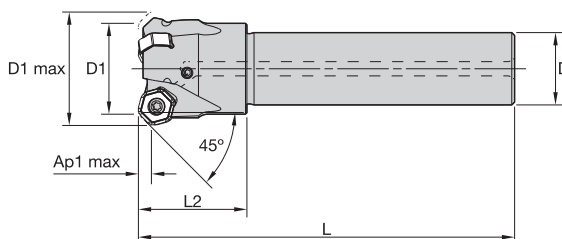
Victory M1200 Mini • Cylindrical Shanks



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



Face Mills



Cylindrical Shanks

order number	catalog number	D1	D1 max	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	lbs
3953897	M1200D100Z02C075HN07L480	1.000	1.343	.750	4.800	1.250	.138	2	19800	Yes	.64
3953898	M1200D100Z03C075HN07L480	1.000	1.343	.750	4.800	1.250	.138	3	19800	Yes	.62
3953899	M1200D125Z03C100HN07L520	1.250	1.593	1.000	5.200	1.500	.138	3	17700	Yes	1.22
3953901	M1200D100Z02C100HN07L800	1.000	1.343	1.000	8.000	1.250	.138	2	19800	Yes	1.66
3953902	M1200D100Z03C100HN07L800	1.000	1.343	1.000	8.000	1.250	.138	3	19800	Yes	1.64

Spare Parts



insert
screw



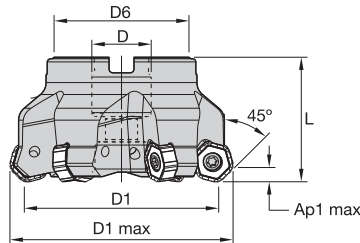
in. lbs.



Torx
driver

D1	insert screw	in. lbs.	Torx driver
1.000	12146034500	31	12148082400
1.250	12146034500	31	12148082400

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



Face Mills

■ Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
4136461	M1200D150Z04S050HN07	1.500	1.813	.500	1.440	1.575	.136	4	15800	Yes	.55
4136462	M1200D150Z05S050HN07	1.500	1.813	.500	1.440	1.575	.136	5	15800	Yes	.55
3954485	M1200D200Z04S075HN07	2.000	2.343	.750	1.750	1.575	.138	4	12500	Yes	1.00
3954486	M1200D200Z05S075HN07	2.000	2.343	.750	1.750	1.575	.138	5	12500	Yes	1.02
3954487	M1200D200Z06S075HN07	2.000	2.343	.750	1.750	1.575	.138	6	12500	Yes	1.00
3954488	M1200D250Z04S075HN07	2.500	2.843	.750	1.750	1.575	.138	4	10000	Yes	1.27
3954489	M1200D250Z06S075HN07	2.500	2.843	.750	1.750	1.575	.138	6	10000	Yes	1.40
3954490	M1200D250Z08S075HN07	2.500	2.843	.750	1.750	1.575	.138	8	10000	Yes	1.36
3954491	M1200D300Z05S100HN07	3.000	3.343	1.000	2.189	1.750	.138	5	8300	Yes	2.00
3954492	M1200D300Z08S100HN07	3.000	3.343	1.000	2.189	1.750	.138	8	8300	Yes	2.25
3954503	M1200D300Z10S100HN07	3.000	3.343	1.000	2.189	1.750	.138	10	8300	Yes	2.12
3954504	M1200D400Z06S150HN07	4.000	4.342	1.500	3.661	1.750	.138	6	6300	Yes	3.74
3954505	M1200D400Z09S150HN07	4.000	4.342	1.500	3.661	1.750	.138	9	6300	Yes	3.68
3954506	M1200D400Z12S150HN07	4.000	4.342	1.500	3.661	1.750	.138	12	6300	Yes	3.65
4130534	M1200D500Z08S150HN07	5.000	5.343	1.500	3.652	2.380	.138	8	5000	Yes	6.31
4130535	M1200D500Z12S150HN07	5.000	5.343	1.500	3.652	2.380	.138	12	5000	Yes	6.52
4130536	M1200D500Z16S150HN07	5.000	5.343	1.500	3.652	2.380	.138	16	5000	Yes	6.63

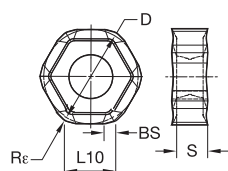
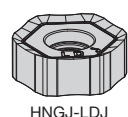
■ Spare Parts

D1	insert screw	in. lbs.	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove	coolant screw assembly
1.500	12146034500	31	12148082400	S424	—	—
2.000	12146034500	31	12148082400	S445	12146102400	—
2.500	12146034500	31	12148082400	S445	12146102400	—
3.000	12146034500	31	12148082400	S458	12146102800	—
4.000	12146034500	31	12148082400	—	—	S2165C
5.000	12146034500	31	12148082400	—	—	S2165C

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.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	—	—	—	—	—	—

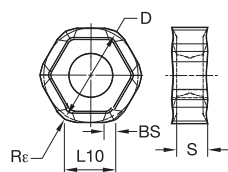
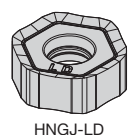


- first choice
- alternate choice

P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ0704ANFNLDJ	12	.500	.268	.176	.064	.047	.003	3954414	3954332

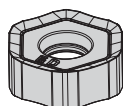


- first choice
- alternate choice

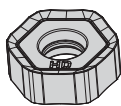
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M			○	○	○	○	○	○	○
K	●	●	○	○	○	○	○	○	○
N									
S			●	●	●	●	○		
H							○		

HNGJ-LD

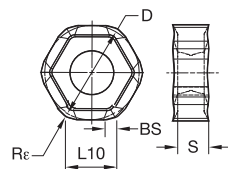
catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNGJ0704ANENLD	12	.500	.268	.176	.064	.047	.003	3954419	3954420	3954421	3954422	—	—	5895291	5895292	5528975	5550905
HNGJ070432ANENLD	12	.500	.268	.176	—	.126	.003	3954428	—	3954429	3954430	—	—	—	—	—	—



HNPJ-GD



HNPJ-HD



- first choice
- alternate choice

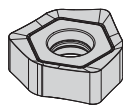
P									
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■ HNPJ-GD

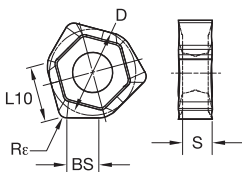
catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNGD	12	.500	.269	.175	.050	.047	.004	3954432	3954473	-	3954474	3954475	5427374	5895293	5895294	5528976	5550906

■ HNPJ-HD

catalog number	cutting edges							TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
		D	L10	S	BS	Rε	hm										
HNPJ0704ANSNHD	12	.500	.269	.174	.049	.047	.006	3954477	3954478	⌋	3954479	3954480	5427375	5895295	5895296		⌋
HNPJ070432ANSNHD	12	.500	.269	.174	—	.126	.006	3954481	3954482	⌋	3954483	3954484	⌋	⌋	⌋	⌋	5895297



XNGJ-LDJ3
Wiper



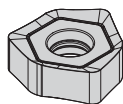
- first choice
- alternate choice

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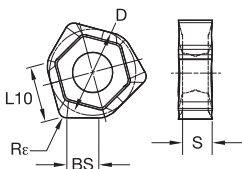
■ XNGJ-LDJ3 Wiper

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-LI
XNGJ0704ANFNLDJ3W	3	.500	.267	.176	.267	.051	.003	3954416	3954413

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



XNGJ-LD3
Wiper



- first choice
- alternate choice

P									
M									
K									
N									
S									
H									

■ XNGJ-LD3 Wiper

catalog number	cutting edges							TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM	
		D	L10	S	BS	Rε	hm											
XNGJ0704ANENLD3W	3	.500	.267	.176	.267	.051	.003	3954424	3954425	3954426	3954427	-	5427373	5895298	-	-	5895299	

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

■ Recommended Starting Speeds [SFM]

Material Group		TN6510			TN6520			TN6525			TN6540			TN7535			WK15CM		
P	1	-	-	-	-	-	-	1340	1045	925	1180	925	785	1790	1555	1460	-	-	-
	2	-	-	-	-	-	-	1045	830	710	830	630	550	1105	1000	905	-	-	-
	3	-	-	-	-	-	-	925	710	610	710	550	450	1000	905	805	-	-	-
	4	-	-	-	-	-	-	770	550	475	590	430	355	750	690	630	-	-	-
	5	-	-	-	-	-	-	1025	770	650	785	590	490	1025	905	830	-	-	-
	6	-	-	-	-	-	-	670	535	430	535	395	335	630	535	430	-	-	-
M	1	-	-	-	-	-	-	630	395	260	430	260	200	805	725	610	-	-	-
	2	-	-	-	-	-	-	395	260	155	260	155	140	725	630	550	-	-	-
	3	-	-	-	-	-	-	415	260	180	275	155	140	570	510	450	-	-	-
K	1	1570	1140	845	1475	1045	750	905	805	725	725	670	590	1165	1045	940	1655	1520	1340
	2	1380	925	670	1280	830	630	710	630	590	570	510	450	925	830	750	1320	1165	1080
	3	1105	845	650	985	750	535	590	535	475	510	475	415	770	690	630	1105	985	905
N	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	-	-	-	155	120	95	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	80	60	40	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	235	140	95	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	200	95	80	-	-	-	-	-	-
H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(continued)

(Recommended Starting Speeds [SFM] — continued)

Material Group		WP25PM	WP35CM	WS30PM	WP40PM	TN6501	THM-U
P	1	1295 1120 1060	1790 1555 1460	— — —	1165 1025 965	— — —	— — —
	2	1080 940 785	1105 1000 905	— — —	985 845 710	— — —	— — —
	3	1000 845 690	1000 905 805	— — —	905 770 630	— — —	— — —
	4	890 725 590	750 690 630	— — —	805 670 535	— — —	— — —
	5	725 670 590	1025 905 830	— — —	670 610 535	— — —	— — —
	6	650 490 395	630 535 430	— — —	590 450 355	— — —	— — —
M	1	805 710 650	805 725 610	890 785 725	770 670 610	— — —	— — —
	2	725 630 510	725 630 550	805 710 570	690 590 490	— — —	— — —
	3	550 475 370	570 510 450	610 535 415	510 450 355	— — —	— — —
K	1	905 805 725	1165 1045 940	— — —	— — —	— — —	— — —
	2	710 630 590	925 830 750	— — —	— — —	— — —	— — —
	3	590 535 475	770 690 630	— — —	— — —	— — —	— — —
N	1	— — —	— — —	— — —	— — —	7870 4720 3935	7870 4720 3935
	2	— — —	— — —	— — —	— — —	5370 3210 2615	5370 3210 2615
	3	— — —	— — —	— — —	— — —	3150 1970 1570	3150 1970 1570
S	1	155 140 95	— — —	180 155 120	155 140 120	— — —	— — —
	2	155 140 95	— — —	180 155 120	155 140 120	— — —	— — —
	3	200 155 95	— — —	215 180 120	200 155 120	— — —	— — —
	4	275 200 140	260 200 130	335 235 155	260 200 140	— — —	— — —
H	1	475 355 275	— — —	— — —	— — —	— — —	— — —
	2	— — —	— — —	— — —	— — —	— — —	— — —
	3	— — —	— — —	— — —	— — —	— — —	— — —

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

Face Mills

Recommended Starting Feeds

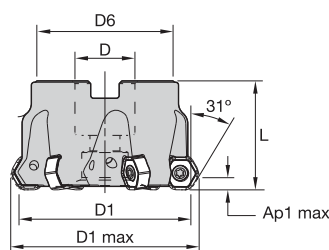
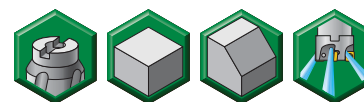
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..LDJ	.007	.013	.026	.005	.009	.018	.004	.007	.014	.003	.006	.012	.003	.006	.011	.F..LDJ
.E..LD	.007	.020	.040	.005	.014	.029	.004	.011	.021	.003	.009	.019	.003	.008	.017	.E..LD
.S..GD	.013	.033	.053	.009	.024	.038	.007	.018	.028	.006	.015	.025	.006	.014	.023	.S..GD
.S..HD	.013	.033	.053	.009	.024	.038	.007	.018	.028	.006	.015	.025	.006	.014	.023	.S..HD

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

- Twelve cutting edges.
- Higher A_{p1} max with standard insert.



Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	A_{p1} max	Z	max RPM	coolant supply	lbs
4136415	M1200HD150Z04S050HN07	1.500	1.768	.500	1.440	1.575	.186	4	15800	Yes	.49
4136416	M1200HD150Z05S050HN07	1.500	1.768	.500	1.440	1.575	.186	5	15800	Yes	.50
4136417	M1200HD200Z04S075HN07	2.000	2.266	.750	1.750	1.575	.186	4	12500	Yes	.89
4136418	M1200HD200Z05S075HN07	2.000	2.266	.750	1.750	1.575	.186	5	12500	Yes	.90
4136419	M1200HD250Z04S075HN07	2.500	2.766	.750	1.750	1.575	.186	4	10000	Yes	1.19
4136420	M1200HD250Z06S075HN07	2.500	2.766	.750	1.750	1.575	.186	6	10000	Yes	1.23
4136421	M1200HD300Z05S100HN07	3.000	3.266	1.000	2.188	1.750	.186	5	8300	Yes	1.92
4136422	M1200HD300Z08S100HN07	3.000	3.266	1.000	2.188	1.750	.186	8	8300	Yes	2.01
4136433	M1200HD400Z06S150HN07	4.000	4.266	1.500	3.661	1.750	.185	6	6300	Yes	3.30
4136434	M1200HD400Z09S150HN07	4.000	4.266	1.500	3.661	1.750	.185	9	6300	Yes	3.44
4136435	M1200HD500Z08S150HN07	5.000	5.265	1.500	3.661	2.380	.185	8	5000	Yes	6.24
4136436	M1200HD500Z12S150HN07	5.000	5.265	1.500	3.661	2.380	.185	12	5000	Yes	6.45

Spare Parts

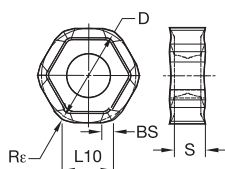
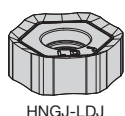


D1	insert screw	in. lbs.	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove	coolant screw assembly
1.500	12146034500	31	12148082400	S424	—	—
2.000	12146034500	31	12148082400	S445	12146102400	—
2.500	12146034500	31	12148082400	S445	12146102400	—
3.000	12146034500	31	12148082400	S458	12146102800	—
4.000	12146034500	31	12148082400	—	—	S2165C
5.000	12146034500	31	12148082400	—	—	S2165C

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

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.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	—	—	—	—	—	—

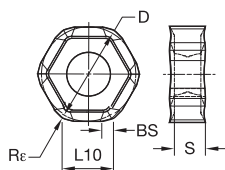
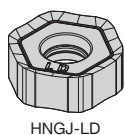


- first choice
- alternate choice

P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalog number	cutting edges	D	L10	S	BS	Re	hm	TN6501	THM-U
HNGJ0704ANFNLDJ	12	.500	.268	.176	.064	.047	.003	3954414	3954332

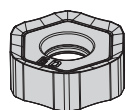


- first choice
- alternate choice

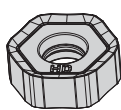
P			●	●	●	●	●	●	●
M			○	○	○	○	○	○	○
K	●	●	○	○	○	○	○	○	○
N									
S			●	●	●	●	●	●	○
H							○		

HNGJ-LD

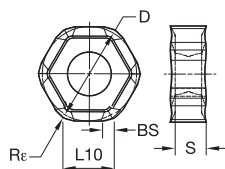
catalog number	cutting edges	D	L10	S	BS	Re	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNGJ0704ANENLD	12	.500	.268	.176	.064	.047	.003	3954419	3954420	3954421	3954422	—	—	5895291	5895292	5528975	5550905
HNGJ070432ANENLD	12	.500	.268	.176	—	.126	.003	3954428	—	3954429	3954430	—	—	—	—	—	—



HNPJ-GD



HNPJ-HD



- first choice

☐ alternate choice

P																		
M																		
K																		
N																		
S																		
H																		

■ HNPJ-GD

catalog number	cutting edges	D	L10	S	BS	R _ε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WP40BM
HNPJ0704ANSNGD	12	.500	.269	.175	.050	.047	.004	3954432	3954473	-	3954474	3954475	5427374	5895293	5895294	5528976

■ HNPJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6510	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WS30PM	WP40PM
HNPJ0704ANSNHD	12	.500	.269	.174	.049	.047	.006	3954477	3954478	-	3954479	3954480	5427375	5895295	5895296	-	5895297
HNPJ070432ANSNHD	12	.500	.269	.174	-	.126	.006	3954481	3954482	-	3954483	3954484	-	-	-	-	5895298

Recommended Starting Speeds

■ Recommended Starting Speeds [SFM]

[illegible]

(continued)

(Recommended Starting Speeds [SFM] — continued)

Material Group		WP25PM			WP35CM			WS30PM			WP40PM			TN6501			THM-U		
P	1	1295	1120	1060	1790	1555	1460	—	—	—	1165	1025	965	—	—	—	—	—	—
	2	1080	940	785	1105	1000	905	—	—	—	985	845	710	—	—	—	—	—	—
	3	1000	845	690	1000	905	805	—	—	—	905	770	630	—	—	—	—	—	—
	4	890	725	590	750	690	630	—	—	—	805	670	535	—	—	—	—	—	—
	5	725	670	590	1025	905	830	—	—	—	670	610	535	—	—	—	—	—	—
	6	650	490	395	630	535	430	—	—	—	590	450	355	—	—	—	—	—	—
M	1	805	710	650	805	725	610	890	785	725	770	670	610	—	—	—	—	—	—
	2	725	630	510	725	630	550	805	710	570	690	590	490	—	—	—	—	—	—
	3	550	475	370	570	510	450	610	535	415	510	450	355	—	—	—	—	—	—
K	1	905	805	725	1165	1045	940	—	—	—	—	—	—	—	—	—	—	—	—
	2	710	630	590	925	830	750	—	—	—	—	—	—	—	—	—	—	—	—
	3	590	535	475	770	690	630	—	—	—	—	—	—	—	—	—	—	—	—
N	1	—	—	—	—	—	—	—	—	—	—	—	—	7870	4720	3935	7870	4720	3935
	2	—	—	—	—	—	—	—	—	—	—	—	—	5370	3210	2615	5370	3210	2615
	3	—	—	—	—	—	—	—	—	—	—	—	—	3150	1970	1570	3150	1970	1570
S	1	155	140	95	—	—	—	180	155	120	155	140	120	—	—	—	—	—	—
	2	155	140	95	—	—	—	180	155	120	155	140	120	—	—	—	—	—	—
	3	200	155	95	—	—	—	215	180	120	200	155	120	—	—	—	—	—	—
	4	275	200	140	260	200	130	335	235	155	260	200	140	—	—	—	—	—	—
H	1	475	355	275	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Recommended Starting Feeds

■ Recommended Starting Feeds [IPT]

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	.005	.011	.021	.004	.008	.015	.003	.006	.012	.003	.005	.010	.002	.005	.009	.F.LDJ
.E.LD	.005	.016	.032	.004	.012	.023	.003	.009	.017	.003	.008	.015	.002	.007	.014	.E.LD
.S.GD	.008	.027	.043	.006	.019	.031	.005	.014	.023	.004	.013	.020	.004	.012	.018	.S.GD
.S.HD	.011	.027	.043	.008	.019	.031	.006	.014	.023	.005	.013	.020	.005	.012	.018	.S.HD

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

One Series Meets Every Face Milling Need •

WIDIA™ Victory™ M1200 Series

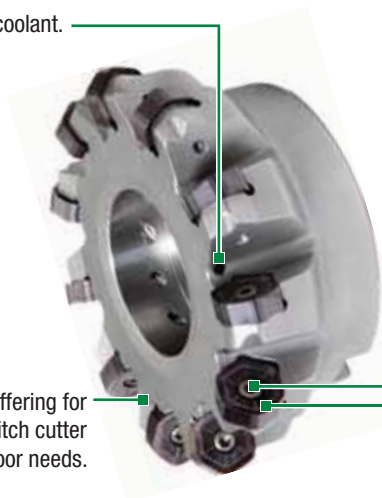
M1200



- Low cost per edge, high productivity solution.
- 75°, 45°, and 31° lead angles.
- One series meets every face milling need.
- Available in WIDIA premium milling grades.
- Better tool life in light to heavy machining.

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

Through tool coolant.



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

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

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

Face Mills

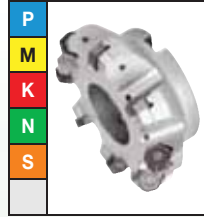


Victory™ M1200 HF 75°

Max depth of cut: .087"

Lead angle: 75°
Indexes per insert: 12
Diameter: 2–6"

Pages: H24–H27

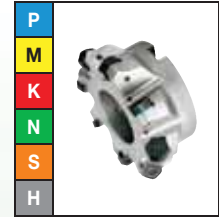


Victory™ M1200 45°

Max depth of cut: .177"

Lead angle: 45°
Indexes per insert: 12
Diameter: 2–12"

Pages: H28–H35

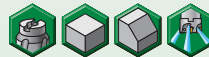


Victory™ M1200 HD 31°

Max depth of cut: .236"

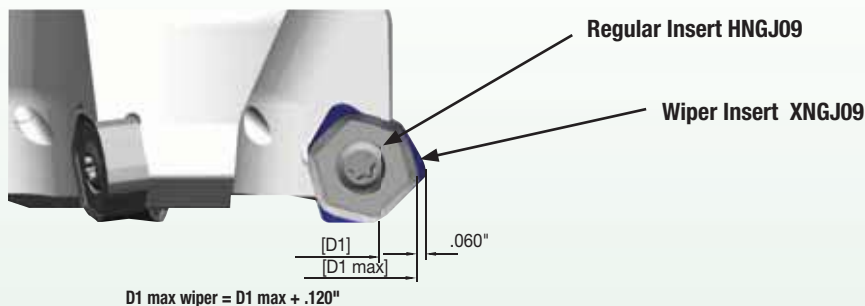
Lead angle: 31°
Indexes per insert: 12
Diameter: 2–6"

Pages: H36–H39



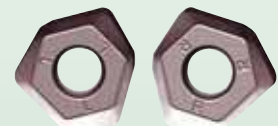
■ Easy-to-use wiper insert setup to achieve excellent surface floor finish

Wiper insert overlapping vs. regular insert



- Wiper inserts only applied with 45° lead angle cutter bodies.
- Easy to use. Regular and wiper inserts are loaded into fixed pockets. No adjustment required.
- Please have D1 max wiper in mind in case of limited working area.
- Use wiper inserts only in combination with periphery ground regular inserts HNGJ09.

- Up to cutting diameter D1=4" load one wiper insert.
- For cutting diameter D1=5" and above load two wiper inserts.
- Each wiper insert XNGJ09 can be applied with three right hand R and three left hand L cutting edges.



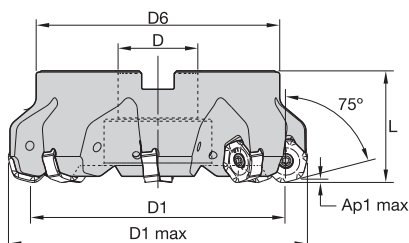
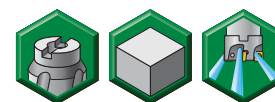
Face Mills • Victory™ M1200 Series

Victory M1200 HF • Shell Mills



Face Mills

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



Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
3954510	M1200HF200Z04S075HN09	2.000	2.704	.750	1.593	1.575	.087	4	11300	Yes	1.13
3954511	M1200HF250Z05S075HN09	2.500	3.204	.750	1.986	1.575	.087	5	8900	Yes	1.60
3954512	M1200HF300Z06S100HN09	3.000	3.704	1.000	2.189	1.750	.087	6	7400	Yes	2.23
3954563	M1200HF400Z08S150HN09	4.000	4.703	1.500	3.661	1.750	.086	8	5800	Yes	3.96
3954564	M1200HF500Z09S150HN09	5.000	5.704	1.500	3.652	2.380	.087	9	4700	Yes	6.87
3954565	M1200HF600Z12S200HN09	6.000	6.706	2.000	4.722	2.380	.087	12	4000	Yes	10.51

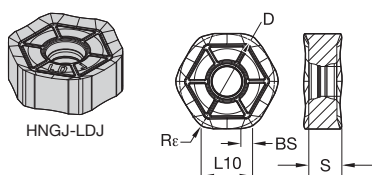
Spare Parts

D1	insert screw	in. lbs.	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw assembly	coolant lock screw	coolant cap
2.00	12146034500	31	12148082400	S445	12146102400	—	—	—
2.50	12146034500	31	12148082400	S445	12146102400	—	—	—
3.00	12146034500	31	12148082400	S458	12146102800	—	—	—
4.00	12146034500	31	12148082400	—	—	S2165C	—	—
5.00	12146034500	31	12148082400	—	—	—	12146110500	12146111800
6.00	12146034500	31	12148082400	—	—	—	12146110600	12146111900

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

Insert Selection Guide

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

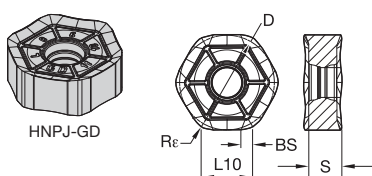


- first choice
- alternate choice

P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalog number	cutting edges	D	L10	S	BS	Re	hm	TN6501	THM-U
HNGJ535ANFNLDJ	12	.625	.338	.219	.071	.047	.001	3865373	3606383

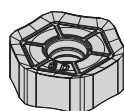


- first choice
- alternate choice

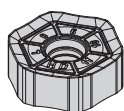
P		●	●	●	●	●	●	●
M		○	○	○	○	○	○	○
K	●	○	○	○	○	○	○	○
N								
S		●	●	●	●	●	○	○
H								

HNPJ-GD

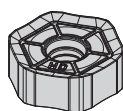
catalog number	cutting edges	D	L10	S	BS	Re	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNPJ535ANSNGD	12	.625	.338	.219	.071	.047	.004	3761185	-	3761187	3761188	5427372	5895374	-	5895375	5550908



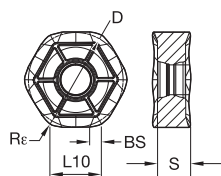
HNGJ-GD



HNPJ-HD



HNGJ-HD



- first choice

- alternate choice

[illegible]

■ HNGJ-GD

catalog number	cutting edges	D	L10	S	BS	R _ε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ535ANSNGD	12	.625	.338	.219	.071	.047	.004	3119541	3614650	3037596	3093721	5427370	-	5528974	5895349	5905250

■ HNPJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNPJ53511ANSNHD	12	.625	.334	.214	—	.171	.005	3670866	—	3670865	—	—	5895378	—	5895379	5895380
HNPJ535ANSNHD	12	.625	.338	.215	.065	.047	.007	3670864	—	3670842	—	5427371	5895376	—	5895377	5895378

■ HNGJ-HD

catalog number	cutting edges							TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM	
		D	L10	S	BS	Rε	hm										
HNGJ53511ANSNHD	12	.625	.334	.214	—	.171	.008	3564083	3564084	3564085	—	—	—	—	—	—	—
HNGJ535ANSNHD	12	.625	.338	.215	.065	.047	.007	3563900	3563901	3563902	—	—	5895371	—	5895372	5895372	5895372

■ Recommended Starting Speeds [SFM]

Material Group		TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM
P	1	– – –	1340 1045 925	1180 925 785	1790 1555 1460	– – –	1295 1120 1060
	2	– – –	1045 830 710	830 630 550	1105 1000 905	– – –	1080 940 785
	3	– – –	925 710 610	710 550 450	1000 905 805	– – –	1000 845 690
	4	– – –	770 550 475	590 430 355	750 690 630	– – –	890 725 590
	5	– – –	1025 770 650	785 590 490	1025 905 830	– – –	725 670 590
	6	– – –	670 535 430	535 395 335	630 535 430	– – –	650 490 395
M	1	– – –	630 395 260	430 260 200	805 725 610	– – –	805 710 650
	2	– – –	395 260 155	260 155 140	725 630 550	– – –	725 630 510
	3	– – –	415 260 180	275 155 140	570 510 450	– – –	550 475 370
K	1	1475 1045 750	905 805 725	725 670 590	1165 1045 940	1655 1520 1340	905 805 725
	2	1280 830 630	710 630 590	570 510 450	925 830 750	1320 1165 1080	710 630 590
	3	985 750 535	590 535 475	510 475 415	770 690 630	1105 985 905	590 535 475
N	1	– – –	– – –	– – –	– – –	– – –	– – –
	2	– – –	– – –	– – –	– – –	– – –	– – –
	3	– – –	– – –	– – –	– – –	– – –	– – –
S	1	– – –	– – –	155 120 95	– – –	– – –	155 140 95
	2	– – –	– – –	80 60 40	– – –	– – –	155 140 95
	3	– – –	– – –	235 140 95	– – –	– – –	200 155 95
	4	– – –	– – –	200 95 80	– – –	– – –	275 200 140
H	1	– – –	– – –	– – –	– – –	– – –	475 355 275
	2	– – –	– – –	– – –	– – –	– – –	– – –
	3	– – –	– – –	– – –	– – –	– – –	– – –

Material Group		WS30PM	WP35CM	WP40PM	TN6501	THM-U
P	1	– – –	1790 1555 1460	1165 1025 965	– – –	– – –
	2	– – –	1105 1000 905	985 845 710	– – –	– – –
	3	– – –	1000 905 805	905 770 630	– – –	– – –
	4	– – –	750 690 630	805 670 535	– – –	– – –
	5	– – –	1025 905 830	670 610 535	– – –	– – –
	6	– – –	630 535 430	590 450 355	– – –	– – –
M	1	890 785 725	805 725 610	770 670 610	– – –	– – –
	2	805 710 570	725 630 550	690 590 490	– – –	– – –
	3	610 535 415	570 510 450	510 450 355	– – –	– – –
K	1	– – –	1165 1045 940	– – –	– – –	– – –
	2	– – –	925 830 750	– – –	– – –	– – –
	3	– – –	770 690 630	– – –	– – –	– – –
N	1	– – –	– – –	– – –	7870 4720 3935	7870 4720 3935
	2	– – –	– – –	– – –	5370 3210 2615	5370 3210 2615
	3	– – –	– – –	– – –	3150 1970 1570	3150 1970 1570
S	1	180 155 120	– – –	155 140 120	– – –	– – –
	2	180 155 120	– – –	155 140 120	– – –	– – –
	3	215 180 120	– – –	200 155 120	– – –	– – –
	4	335 235 155	260 200 130	260 200 140	– – –	– – –
H	1	– – –	– – –	– – –	– – –	– – –
	2	– – –	– – –	– – –	– – –	– – –
	3	– – –	– – –	– – –	– – –	– – –

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

Recommended Starting Feeds

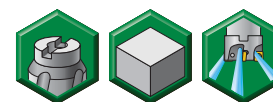
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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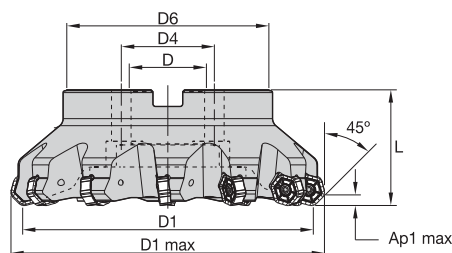
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F.LDJ	.018	.036	.073	.013	.026	.052	.010	.019	.039	.008	.017	.034	.008	.015	.031	.F.LDJ
.E..LD	.018	.055	.112	.013	.039	.079	.010	.029	.058	.008	.025	.051	.008	.023	.046	.E..LD
.S..GD	.028	.093	.153	.020	.066	.106	.015	.049	.078	.013	.042	.068	.012	.039	.062	.S..GD
.S..HD	.036	.093	.153	.026	.066	.106	.019	.049	.078	.017	.042	.068	.015	.039	.062	.S..HD

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

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



Face Mills



■ Shell Mills

order number	catalog number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
3323871	M1200D200Z04S075HN09	2.000	2.434	.750	—	1.750	1.570	.177	4	12500	Yes	.81
3323872	M1200D200Z05S075HN09	2.000	2.434	.750	—	1.750	1.570	.177	5	12500	Yes	.82
3650539	M1200D250Z04S075HN09	2.500	2.933	.750	—	2.144	1.570	.177	4	10000	Yes	1.35
3323873	M1200D250Z06S075HN09	2.500	2.933	.750	—	2.144	1.570	.177	6	10000	Yes	1.32
3323874	M1200D250Z07S075HN09	2.500	2.933	.750	—	2.144	1.570	.177	7	10000	Yes	1.34
3650540	M1200D300Z05S100HN09	3.000	3.433	1.000	—	2.189	1.750	.177	5	8300	Yes	1.86
3323875	M1200D300Z06S100HN09	3.000	3.433	1.000	—	2.189	1.750	.177	6	8300	Yes	1.79
3323876	M1200D300Z09S100HN09	3.000	3.433	1.000	—	2.189	1.750	.177	9	8300	Yes	1.97
3650541	M1200D400Z06S125HN09	4.000	4.432	1.250	—	2.722	1.750	.177	6	6300	Yes	3.17
3323877	M1200D400Z08S125HN09	4.000	4.432	1.250	—	2.880	1.750	.177	8	6300	Yes	2.93
3323878	M1200D400Z11S125HN09	4.000	4.432	1.250	—	2.880	1.750	.177	11	6300	Yes	3.14
3958019	M1200D400Z06S150HN09	4.000	4.432	1.500	—	3.661	1.750	.177	6	6300	Yes	4.17
3958020	M1200D400Z08S150HN09	4.000	4.432	1.500	—	3.661	1.750	.177	8	6300	Yes	4.13
3958021	M1200D400Z11S150HN09	4.000	4.432	1.500	—	3.661	1.750	.177	11	6300	Yes	4.16
3650542	M1200D500Z08S150HN09	5.000	5.431	1.500	—	3.652	2.380	.177	8	5000	Yes	6.20
3323879	M1200D500Z10S150HN09	5.000	5.431	1.500	—	3.810	2.380	.177	10	5000	Yes	5.94
3323880	M1200D500Z14S150HN09	5.000	5.431	1.500	—	3.810	2.380	.177	14	5000	Yes	6.21
4086796	M1200D600Z09S200HN09	6.000	6.430	2.000	—	4.722	2.380	.177	9	4100	Yes	9.04
3323881	M1200D600Z12S200HN09	6.000	6.432	2.000	—	4.879	2.380	.177	12	4100	Yes	9.10
3323882	M1200D600Z16S200HN09	6.000	6.432	2.000	—	4.879	2.380	.177	16	4100	Yes	9.36
3954507	M1200D800Z16S250HN09	8.000	8.432	2.500	4.000	5.118	2.380	.177	16	3130	Yes	13.14
4086797	M1200D800Z10S250HN09	8.000	8.433	2.500	4.000	5.118	2.380	.177	10	3130	Yes	13.01
4086798	M1200D1000Z12S250HN09	10.000	10.433	2.500	4.000	7.120	2.380	.177	12	2510	Yes	24.22
3954508	M1200D1000Z20S250HN09	10.000	10.433	2.500	4.000	7.120	2.380	.177	20	2510	Yes	24.52
4086799	M1200D1200Z14S250HN09	12.000	12.433	2.500	4.000	9.016	3.150	.177	14	2090	Yes	41.50
3954509	M1200D1200Z24S250HN09	12.000	12.433	2.500	4.000	9.016	3.150	.177	24	2090	Yes	42.66

(continued)

(Shell Mills — continued)

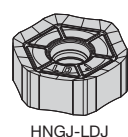
Spare Parts

								
D1	insert screw	in. lbs.	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove	coolant screw assembly	coolant lock screw	coolant cap
2.000	12146034500	31	12148082400	S445	12146102400	—	—	—
2.500	12146034500	31	12148082400	S445	12146102400	—	—	—
3.000	12146034500	31	12148082400	S458	12146102800	—	—	—
4.000	12146034500	31	12148082400	—	—	12146109500	—	—
4.000	12146034500	31	12148082400	—	—	S2165C	—	—
5.000	12146034500	31	12148082400	—	—	—	12146110500	12146111800
6.000	12146034500	31	12148082400	—	—	—	12146110600	12146111900
8.000	12146034500	31	12148082400	—	—	—	—	12146112000
10.000	12146034500	31	12148082400	—	—	—	—	12146112100
12.000	12146034500	31	12148082400	—	—	—	—	12146112200

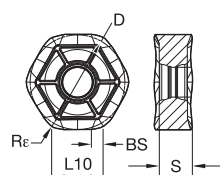
NOTE: Socket-head cap screw with coolant groove, coolant lock screw assembly, coolant lock screw, and coolant cap must be ordered separately.

Insert Selection Guide

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



HNGJ-LDJ

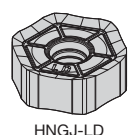


- first choice
- alternate choice

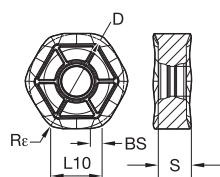
P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6501	THM-U
HNGJ535ANFNLDJ	12	.625	.338	.219	.071	.047	.001	3865373	3606383



HNGJ-LD

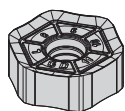


- first choice
- alternate choice

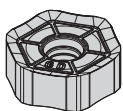
P			●	●	●	●	●	●	●
M		○	●	○	○	○	○	○	○
K	●	○	○	○	○	○	○	○	○
N									
S			●				●	●	○
H							○		

HNGJ-LD

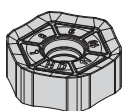
catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ535ANENLD	12	.625	.338	.219	.071	.047	.002	3083559	3330950	3030034	3030017	5895346	5528973	5895347	5895348	



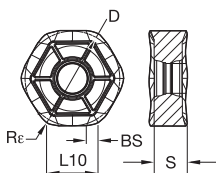
HNPJ-GD



HNGJ-GD



HNPJ-HD



- first choice

- alternate choice

P									
M									
K									
N									
S									
H									

Face Mills

■ HNPJ-GD

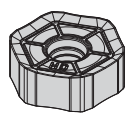
catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
								3761185	-	3761187	3761188	5427372	5895374	-	5895375	5560908
HNPJ535ANSNGD	12	.625	.338	.219	.071	.047	.004									

■ HNGJ-GD

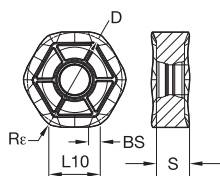
catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ535ANSNGD	12	.625	.338	.219	.071	.047	.004	3119541	3614650	3037596	3093721	5427370	-	5528974	5895349	5895350

■ HNPJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
								3670864	3670865	3670842	5427371	5895376	5895377	5550909		
HNPJ53511ANSNHD	12	.625	.334	.214	—	.171	.005	3670866	3670865	3670865	3670865	3670865	5895378	5895378	5895379	5895380
HNPJ535ANSNHD	12	.625	.338	.215	.065	.047	.007	3670864	3670865	3670842	3670842	5427371	5895376	5895377	5895377	5550909



HNGJ-HD



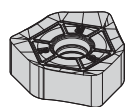
- first choice

- alternate choice

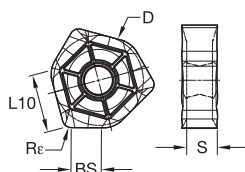
[illegible]

■ HNGJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HNGJ53511ANSNHD	12	.625	.334	.214	—	.171	.008	3564083	3564084	3564085	■	■	■	■	■	■
HNGJ535ANSNHD	12	.625	.338	.215	.065	.047	.007	3563900	3563901	3563902	■	■	5895371	■	5895372	5895373



XNGJ-LDJ3
Winer



- first choice

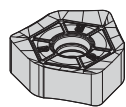
- alternate choice

P	Blue	Light Blue	
M	Yellow	Light Yellow	
K	Red	Light Orange	
N	Green	Black	Black
S	Orange	Light Orange	
H	Grey	Light Grey	

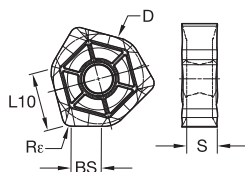
■ XNGJ-LDJ3 Wiper

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6501 TUM II
XNGJ535ANFNLDJ3W	3	.625	.377	.217	.230	.063	.001	3965375 2066260

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



XNGJ-GD3
Wiper



- first choice

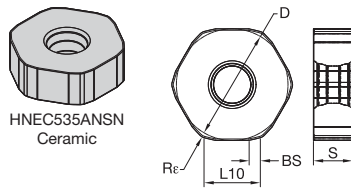
- alternate choice

[illegible]

■ XNGJ-GD3 Wiper

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
XNGJ535ANSNGD3W	3	.625	.377	.217	.230	.063	.004	3524707	3523620	3066479	-	5622622	5895381	-	-	5905282

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



- first choice
- alternate choice

P	
M	
K	●
N	
S	
H	

Face Mills

■ HNEC535ANSN Ceramic

catalog number	cutting edges	D	L10	S	BS	Rε	hm	WK25YM
HNEC535ANSN	12	.625	.361	.219	.077	.047	.008	5910033

■ Recommended Starting Speeds [SFM]

Face Mills

Material Group		TN6520			TN6525			TN6540			TN7535			WK15CM			WP25PM		
P	1	–	–	–	1340	1045	925	1180	925	785	1790	1555	1460	–	–	–	1295	1120	1060
	2	–	–	–	1045	830	710	830	630	550	1105	1000	905	–	–	–	1080	940	785
	3	–	–	–	925	710	610	710	550	450	1000	905	805	–	–	–	1000	845	690
	4	–	–	–	770	550	475	590	430	355	750	690	630	–	–	–	890	725	590
	5	–	–	–	1025	770	650	785	590	490	1025	905	830	–	–	–	725	670	590
	6	–	–	–	670	535	430	535	395	335	630	535	430	–	–	–	650	490	395
M	1	–	–	–	630	395	260	430	260	200	805	725	610	–	–	–	805	710	650
	2	–	–	–	395	260	155	260	155	140	725	630	550	–	–	–	725	630	510
	3	–	–	–	415	260	180	275	155	140	570	510	450	–	–	–	550	475	370
K	1	1475	1045	750	905	805	725	725	670	590	1165	1045	940	1655	1520	1340	905	805	725
	2	1280	830	630	710	630	590	570	510	450	925	830	750	1320	1165	1080	710	630	590
	3	985	750	535	590	535	475	510	475	415	770	690	630	1105	985	905	590	535	475
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	155	120	95	–	–	–	–	–	–	155	140	95
	2	–	–	–	–	–	–	80	60	40	–	–	–	–	–	–	155	140	95
	3	–	–	–	–	–	–	235	140	95	–	–	–	–	–	–	200	155	95
	4	–	–	–	–	–	–	200	95	80	–	–	–	–	–	–	275	200	140
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	475	355	275
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [SFM] — continued)

Material Group		WS30PM	WP35CM	WP40PM	WK25YM	TN6501	THM-U
P	1	— — —	1790 1555 1460	1165 1025 965	— — —	— — —	— — —
	2	— — —	1105 1000 905	985 845 710	— — —	— — —	— — —
	3	— — —	1000 905 805	905 770 630	— — —	— — —	— — —
	4	— — —	750 690 630	805 670 535	— — —	— — —	— — —
	5	— — —	1025 905 830	670 610 535	— — —	— — —	— — —
	6	— — —	630 535 430	590 450 355	— — —	— — —	— — —
M	1	890 785 725	805 725 610	770 670 610	— — —	— — —	— — —
	2	805 710 570	725 630 550	690 590 490	— — —	— — —	— — —
	3	610 535 415	570 510 450	510 450 355	— — —	— — —	— — —
K	1	— — —	1165 1045 940	— — —	3170 2880 2560	— — —	750 670 590
	2	— — —	925 830 750	— — —	2510 2240 2090	— — —	— — —
	3	— — —	770 690 630	— — —	2110 1870 1720	— — —	— — —
N	1	— — —	— — —	— — —	— — —	7870 4720 3935	7870 4720 3935
	2	— — —	— — —	— — —	— — —	5370 3210 2615	5370 3210 2615
	3	— — —	— — —	— — —	— — —	3150 1970 1570	3150 1970 1570
S	1	180 155 120	— — —	155 140 120	— — —	— — —	— — —
	2	180 155 120	— — —	155 140 120	— — —	— — —	— — —
	3	215 180 120	— — —	200 155 120	— — —	— — —	— — —
	4	335 235 155	260 200 130	260 200 140	— — —	— — —	— — —
H	1	— — —	— — —	— — —	— — —	— — —	— — —
	2	— — —	— — —	— — —	— — —	— — —	— — —
	3	— — —	— — —	— — —	— — —	— — —	— — —

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

Recommended Starting Feeds

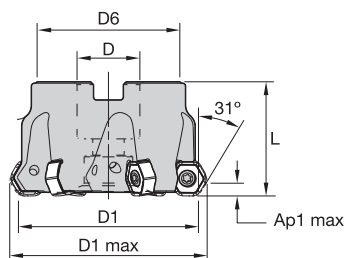
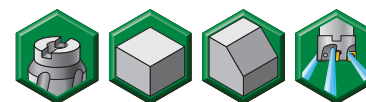
■ Recommended Starting Feeds [IPT]

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	.007	.013	.026	.005	.009	.019	.004	.007	.014	.003	.006	.012	.003	.006	.011	.F.LDJ
.E..LD	.007	.020	.040	.005	.014	.029	.004	.011	.021	.003	.009	.019	.003	.008	.017	.E..LD
.S..GD	.010	.033	.053	.007	.024	.038	.006	.018	.028	.005	.015	.025	.004	.014	.023	.S..GD
.S..HD	.013	.033	.053	.009	.024	.038	.007	.018	.028	.006	.015	.025	.006	.014	.023	.S..HD
.S..Ceramic	.007	.013	.020	.005	.009	.014	.004	.007	.011	.003	.006	.009	.003	.006	.008	.S..Ceramic

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

- Twelve cutting edges.
- Higher A_{p1} max with standard insert.
- Low cutting forces for maximum productivity.



Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	A_{p1} max	Z	max RPM	coolant supply	lbs
4147876	M1200HD200Z04S075HN09	2.000	2.337	.750	1.593	1.575	.236	4	12500	Yes	.75
4147877	M1200HD200Z05S075HN09	2.000	2.337	.750	1.593	1.575	.236	5	12500	Yes	.73
4147878	M1200HD250Z04S075HN09	2.500	2.836	.750	1.986	1.575	.236	4	10000	Yes	1.28
4147879	M1200HD250Z06S075HN09	2.500	2.836	.750	1.986	1.575	.236	6	10000	Yes	1.28
4147880	M1200HD300Z05S100HN09	3.000	3.336	1.000	2.189	1.750	.236	5	8300	Yes	1.86
4147881	M1200HD300Z08S100HN09	3.000	3.336	1.000	2.189	1.750	.236	8	8300	Yes	1.86
4147882	M1200HD400Z06S150HN09	4.000	4.335	1.500	3.661	1.750	.236	6	6300	Yes	3.19
4147883	M1200HD400Z08S150HN09	4.000	4.335	1.500	3.661	1.750	.236	8	6300	Yes	3.21
4147884	M1200HD500Z08S150HN09	5.000	5.335	1.500	3.652	2.380	.236	8	5000	Yes	6.28
4147885	M1200HD500Z10S150HN09	5.000	5.335	1.500	3.652	2.380	.236	10	5000	Yes	6.26
4147886	M1200HD600Z09S200HN09	6.000	6.335	2.000	4.722	2.380	.236	9	4100	Yes	9.26
4147887	M1200HD600Z12S200HN09	6.000	6.335	2.000	4.722	2.380	.236	12	4100	Yes	9.23

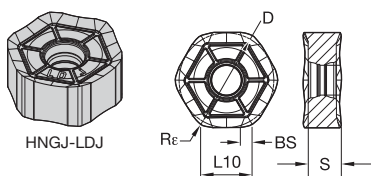
Spare Parts

D1	insert screw	in. lbs.	Torx driver	socket-head cap screw	socket-head cap screw with coolant groove	coolant screw assembly	coolant lock screw	coolant cap
2.000	12146034500	31	12148082400	S445	12146102400	—	—	—
2.500	12146034500	31	12148082400	S445	12146102400	—	—	—
3.000	12146034500	31	12148082400	S458	12146102800	—	—	—
4.000	12146034500	31	12148082400	—	—	S2165C	—	—
5.000	12146034500	31	12148082400	—	—	S2165C	—	—
6.000	12146034500	31	12148082400	—	—	—	12146110600	12146111900

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

Insert Selection Guide

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

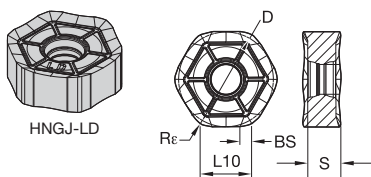


● first choice
○ alternate choice

P			
M			
K			
N	●	●	
S			
H			

HNGJ-LDJ

catalog number	cutting edges	D	L10	S	BS	Re	hm	TN6501	THM-U
HNGJ535ANFNLDJ	12	.625	.338	.219	.071	.047	.001	3865373	3606383



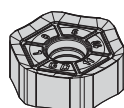
● first choice
○ alternate choice

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

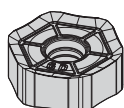
HNGJ-LD

catalog number	cutting edges	D	L10	S	BS	Re	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNGJ535ANENLD	12	.625	.338	.219	.071	.047	.002	3093559	3330950	3030034	3030017	5895346	5528973	5895347	5895348	

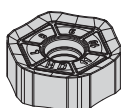
Face Mills



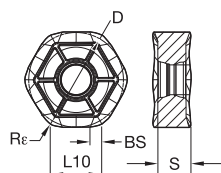
HNPJ-GD



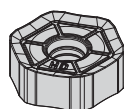
HNGJ-GD



HNPJ-HD



- first choice
- alternate choice



HNGJ-HD

HNPJ-GD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNPJ535ANSNGD	12	.625	.338	.219	.071	.047	.004	3761185	-	3761187	3761188	5895374	5427372	-	5895375	5550908

HNGJ-GD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNGJ535ANSNGD	12	.625	.338	.219	.071	.047	.004	3119541	3614650	3037596	3093721	-	5427370	5528974	5895349	5895350

HNPJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNPJ53511ANSNHD	12	.625	.334	.214	-	.171	.005	3670866	-	3670865	-	5895378	-	-	5895379	5895380
HNPJ535ANSNHD	12	.625	.338	.215	.065	.047	.007	3670864	-	3670842	-	5895376	5427371	-	5895377	5550909

HNGJ-HD

catalog number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7535	WP25PM	WK15CM	WS30PM	WP35CM	WP40PM
HNGJ53511ANSNHD	12	.625	.334	.214	-	.171	.008	3563900	3564083	3564084	-	-	-	-	-	-
HNGJ535ANSNHD	12	.625	.338	.215	.065	.047	.007	3563901	3564085	3563902	-	-	-	-	-	-

■ Recommended Starting Speeds [SFM]

Material Group		TN6501	TN6520	TN6525	TN6540	TN7535	WP25PM
P	1	- - -	- - -	1340 1045 925	1180 925 785	1790 1555 1460	1295 1120 1060
	2	- - -	- - -	1045 830 710	830 630 550	1105 1000 905	1080 940 785
	3	- - -	- - -	925 710 610	710 550 450	1000 905 805	1000 845 690
	4	- - -	- - -	770 550 475	590 430 355	750 690 630	890 725 590
	5	- - -	- - -	1025 770 650	785 590 490	1025 905 830	725 670 590
	6	- - -	- - -	670 535 430	535 395 335	630 535 430	650 490 395
M	1	- - -	- - -	630 395 260	430 260 200	805 725 610	805 710 650
	2	- - -	- - -	395 260 155	260 155 140	725 630 550	725 630 510
	3	- - -	- - -	415 260 180	275 155 140	570 510 450	550 475 370
K	1	- - -	1475 1045 750	905 805 725	725 670 590	1165 1045 940	905 805 725
	2	- - -	1280 830 630	710 630 590	570 510 450	925 830 750	710 630 590
	3	- - -	985 750 535	590 535 475	510 475 415	770 690 630	590 535 475
N	1	7870 4720 3935	- - -	- - -	- - -	- - -	- - -
	2	5370 3210 2615	- - -	- - -	- - -	- - -	- - -
	3	3150 1970 1570	- - -	- - -	- - -	- - -	- - -
S	1	- - -	- - -	- - -	155 120 95	- - -	155 140 95
	2	- - -	- - -	- - -	80 60 40	- - -	155 140 95
	3	- - -	- - -	- - -	235 140 95	- - -	200 155 95
	4	- - -	- - -	- - -	200 95 80	- - -	275 200 140
H	1	- - -	- - -	- - -	- - -	- - -	475 355 275
	2	- - -	- - -	- - -	- - -	- - -	- - -
	3	- - -	- - -	- - -	- - -	- - -	- - -

Material Group		WK15CM	WS30PM	WP35CM	WP40PM	TN6501	THM-U
P	1	- - -	- - -	1790 1555 1460	1165 1025 965	- - -	- - -
	2	- - -	- - -	1105 1000 905	985 845 710	- - -	- - -
	3	- - -	- - -	1000 905 805	905 770 630	- - -	- - -
	4	- - -	- - -	750 690 630	805 670 535	- - -	- - -
	5	- - -	- - -	1025 905 830	670 610 535	- - -	- - -
	6	- - -	- - -	630 535 430	590 450 355	- - -	- - -
M	1	- - -	890 785 725	805 725 610	770 670 610	- - -	- - -
	2	- - -	805 710 570	725 630 550	690 590 490	- - -	- - -
	3	- - -	610 535 415	570 510 450	510 450 355	- - -	- - -
K	1	1655 1520 1340	- - -	1165 1045 940	- - -	- - -	- - -
	2	1320 1165 1080	- - -	925 830 750	- - -	- - -	- - -
	3	1105 985 905	- - -	770 690 630	- - -	- - -	- - -
N	1	- - -	- - -	- - -	- - -	7870 4720 3935	7870 4720 3935
	2	- - -	- - -	- - -	- - -	5370 3210 2615	5370 3210 2615
	3	- - -	- - -	- - -	- - -	3150 1970 1570	3150 1970 1570
S	1	- - -	180 155 120	- - -	155 140 120	- - -	- - -
	2	- - -	180 155 120	- - -	155 140 120	- - -	- - -
	3	- - -	215 180 120	- - -	200 155 120	- - -	- - -
	4	- - -	335 235 155	260 200 130	260 200 140	- - -	- - -
H	1	- - -	- - -	- - -	- - -	- - -	- - -
	2	- - -	- - -	- - -	- - -	- - -	- - -
	3	- - -	- - -	- - -	- - -	- - -	- - -

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

Recommended Starting Feeds

■ Recommended Starting Feeds [IPT]

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	.005	.011	.021	.004	.008	.015	.003	.006	.012	.003	.005	.010	.002	.005	.009	.F.LDJ
.E..LD	.005	.016	.032	.004	.012	.023	.003	.009	.017	.003	.008	.015	.002	.007	.014	.E..LD
.S..GD	.008	.027	.043	.006	.019	.031	.005	.014	.023	.004	.013	.020	.004	.012	.018	.S..GD
.S..HD	.011	.027	.043	.008	.019	.031	.006	.014	.023	.005	.013	.020	.005	.012	.018	.S..HD

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

When Low Cutting Forces Are Required •

M640 Series

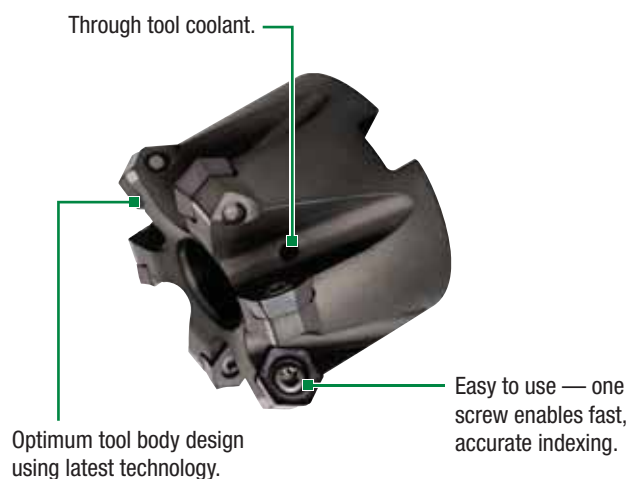
M640



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

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

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



Face Mills



M640

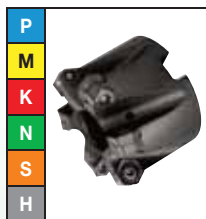
Max depth of cut: .180"

Lead angle: 32°

Indexes per insert: 6

Diameter: 1.25–4"

Pages: H42–H47



■ Insert Offering



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



Six effective cutting edges.

Highly positive rake:

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

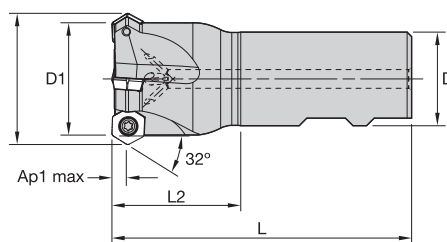
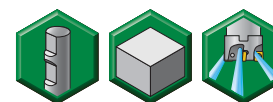
Face Mills • M640 Series

Weldon® Shanks



Face Mills

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



Weldon Shanks

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
2961908	M640D125Z03W125HP06	1.250	1.500	1.250	4.000	1.719	.189	3	13500	Yes	1.30
2961909	M640D150Z04W125HP06	1.500	1.750	1.250	4.000	1.719	.189	4	12000	Yes	1.30

Spare Parts



insert
screw



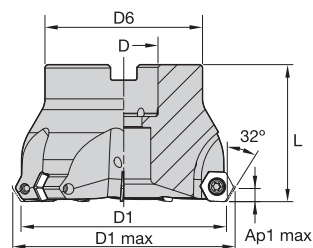
in. lbs.



Torx
driver

D1			
1.250	12148038800	36	12148000600
1.500	12148038800	36	12148000600

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



Face Mills

■ Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
2961910	M640D200Z05S075HP06	2.000	2.250	.750	1.700	1.500	.189	5	11500	Yes	1.10
2961911	M640D250Z06S100HP06	2.500	2.750	1.000	2.200	1.750	.189	6	10100	Yes	1.98
2961912	M640D300Z07S100HP06	3.000	3.250	1.000	2.300	2.000	.189	7	7900	Yes	2.65
2961913	M640D400Z09S125HP06	4.000	4.250	1.250	2.800	2.000	.189	9	6300	Yes	3.53

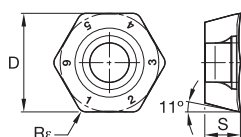
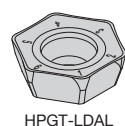
■ Spare Parts



D1	insert screw	in. lbs.	Torx driver
2.000	12148038800	36	12148000600
2.500	12148038800	36	12148000600
3.000	12148038800	36	12148000600
4.000	12148038800	36	12148000600

■ Insert Selection Guide

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



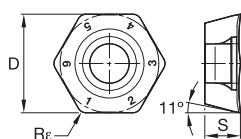
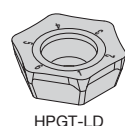
- first choice
- alternate choice

P				
M				
K				
N				
S				
H				

■ HPGT-LDAL

					TN6501	THM-U	TUM
catalog number	cutting edges	D	S	Rε	hm		
HPGT225DZFRDLAL	6	.433	.158	.035	.003	2957548	2288107

NOTE: Depth of cut $Ap1 \text{ max} = .118"$ with this geometry.



- first choice
- alternate choice

[illegible]

■ HPGT-LD

catalog number	cutting edges	D	S	Rε	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HPGT225DZERLD	6	.429	.157	.039	.003	2288072	2957585	2957547	2957587	2288070	2288070	2288070	5895784	5895784	5895784	5895784	5895784

NOTE: Depth of cut $Ap1_{max} = .118"$ with this geometry.



catalog number	cutting edges	D	S	R _E	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WP35CM	WP40PM	
HPPT225DZENGD	6	.432	.156	.039	.004	-	-	2957583	2957586	2957582	2271760	2271759	-	5895788	-	5895790	5895789

catalog number	cutting edges	D	S	Rε	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HPGT225DZENGD	6	.432	.156	.039	.004	2288069	2957589	-	2957588	2957546	2288067	2288066	5427387	5895782	5528978	-	5895783

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

catalog number	cutting edges	D	S	BS	Rε	hm	TN2510	TN6510	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WP25PM	WS30PM	WP35CM	WP40PM
HPGT06T3DZERG3W	3	.439	.158	.113	.039	.004	-	2957549	-	2957584	-	2288103	-	5427388	5895786	-	-	5895787

■ Recommended Starting Speeds [SFM]

Face Mills

Material Group		TN2510			TN6510			TN6520			TN6525			TN6540			TN7525		
P	1	2165	1910	1770	–	–	–	–	–	–	1340	1045	925	1180	925	785	1340	1025	925
	2	1340	1220	1080	–	–	–	–	–	–	1045	830	710	830	630	550	1025	830	710
	3	1220	1080	1000	–	–	–	–	–	–	925	710	610	710	550	450	925	710	610
	4	905	845	750	–	–	–	–	–	–	770	550	475	590	430	355	770	550	475
	5	1080	985	905	–	–	–	–	–	–	1025	770	650	785	590	490	1025	770	650
	6	750	670	570	–	–	–	–	–	–	670	535	430	535	395	335	670	535	430
M	1	890	785	690	–	–	–	–	–	–	630	395	260	430	260	200	805	725	610
	2	805	690	630	–	–	–	–	–	–	395	260	155	260	155	140	725	630	550
	3	630	570	490	–	–	–	–	–	–	415	260	180	275	155	140	570	510	450
K	1	1380	1180	985	1570	1140	845	1475	1045	750	905	805	725	725	670	590	1240	925	785
	2	1180	985	830	1380	925	670	1280	830	630	710	630	590	570	510	450	1060	785	650
	3	985	830	650	1105	845	650	985	750	535	590	535	475	510	475	415	785	650	550
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–	–	–	–	155	120	95	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	80	60	40	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	235	140	95	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	200	95	80	–	–	–
H	1	475	360	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	475	360	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	380	260	150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Material Group		TN7535			WK15CM			WP25PM			WS30PM			WP35CM			WP40PM		
P	1	1790	1555	1460	–	–	–	1295	1120	1060	–	–	–	1790	1555	1460	1165	1025	965
	2	1105	1000	905	–	–	–	1080	940	785	–	–	–	1105	1000	905	985	845	710
	3	1000	905	805	–	–	–	1000	845	690	–	–	–	1000	905	805	905	770	630
	4	750	690	630	–	–	–	890	725	590	–	–	–	750	690	630	805	670	535
	5	1025	905	830	–	–	–	725	670	590	–	–	–	1025	905	830	670	610	535
	6	630	535	430	–	–	–	650	490	395	–	–	–	630	535	430	590	450	355
M	1	805	725	610	–	–	–	805	710	650	890	785	725	805	725	610	770	670	610
	2	725	630	550	–	–	–	725	630	510	805	710	570	725	630	550	690	590	490
	3	570	510	450	–	–	–	550	475	370	610	535	415	570	510	450	510	450	355
K	1	1165	1045	940	1655	1520	1340	905	805	725	–	–	–	1165	1045	940	–	–	–
	2	925	830	750	1320	1165	1080	710	630	590	–	–	–	925	830	750	–	–	–
	3	770	690	630	1105	985	905	590	535	475	–	–	–	770	690	630	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	155	140	95	180	155	120	–	–	–	155	140	120
	2	–	–	–	–	–	–	155	140	95	180	155	120	–	–	–	155	140	120
	3	–	–	–	–	–	–	200	155	95	215	180	120	–	–	–	200	155	120
	4	–	–	–	–	–	–	275	200	140	335	235	155	260	200	130	260	200	140
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [SFM] — continued)

Material Group		TN6501			THM-U			THM		
P	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-
M	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
K	1	-	-	-	750	670	590	475	355	295
	2	-	-	-	-	-	-	490	395	275
	3	-	-	-	-	-	-	510	370	235
N	1	7870	4720	3935	7870	4720	3935	3540	2365	1970
	2	5370	3210	2615	5370	3210	2615	2695	1830	1520
	3	3150	1970	1570	3150	1970	1570	1770	1105	785
S	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-
H	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-

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

Recommended Starting Feeds

■ Recommended Starting Feeds [IPT]

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	.005	.013	.018	.004	.010	.013	.003	.007	.010	.003	.006	.009	.002	.006	.008	.F.LDAL
.E..LD	.005	.013	.018	.004	.010	.013	.003	.007	.010	.003	.006	.009	.002	.006	.008	.E..LD
.E..GD	.005	.019	.021	.004	.014	.015	.003	.010	.011	.003	.009	.010	.002	.008	.009	.E..GD

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

The Ideal Heavy-Duty Face Milling Platform •
M660 Series

M660



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

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



Face Mills



M660 SN1205..

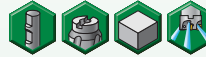
Max depth of cut: 250"

Lead angle: 45°

Indexes per insert: 4

Diameter: 1–6"

Pages: H50–H55



■ Insert Offering



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

Thick inserts for reliability and high MRR capability.

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

Positive rake angle:

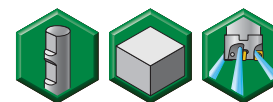
- Soft cutting action.
- Less spindle power requirement.
- Less chipping on workpiece in cast iron.
- Less burs on workpiece in steel.
- High feed rate capability.

Face Mills • M660 Series

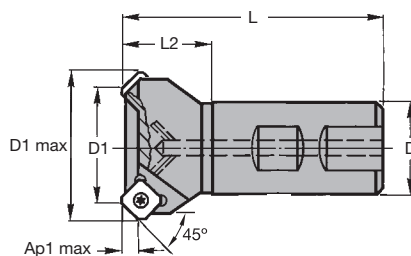
Weldon® Shanks • SN1205..



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



Face Mills



Weldon Shanks

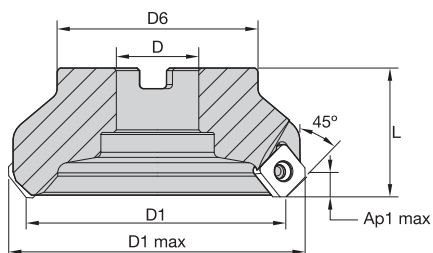
order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
2646651	M660D100Z02W100SN12	1.000	1.540	1.000	3.750	1.470	.250	2	15000	Yes	.70
2646652	M660D125Z03W125SN12	1.250	1.790	1.250	4.000	1.720	.250	3	13500	Yes	.70
2646653	M660D150Z04W125SN12	1.500	2.040	1.250	4.000	1.720	.250	4	12000	Yes	1.40
2646654	M660D200Z04W125SN12	2.000	2.520	1.250	4.000	1.720	.250	4	10500	Yes	1.80

Spare Parts



D1	insert screw	in. lbs.	Torx driver
1.000	MS2260	31	12148007600
1.250	MS2260	31	12148007600
1.500	MS2260	31	12148007600
2.000	MS2260	31	12148007600

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



Face Mills

■ Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
2646747	M660D200Z04S075SN12	2.000	2.520	.750	1.700	2.000	.250	4	14000	Yes	.50
2646749	M660D300Z06S100SN12	3.000	3.560	1.000	2.300	2.000	.250	6	11000	Yes	.60
2646750	M660D400Z07S125SN12	4.000	4.580	1.250	2.800	2.000	.250	7	9900	No	1.20
2646752	M660D600Z10S150SN12	6.000	6.520	1.500	4.000	2.000	.250	10	7900	No	2.80

■ Spare Parts

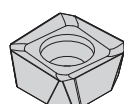


D1	insert screw	in. lbs.	Torx driver
2.000	MS2260	31	12148007600
3.000	MS2260	31	12148007600
4.000	MS2260	31	12148007600
6.000	MS2260	31	12148007600

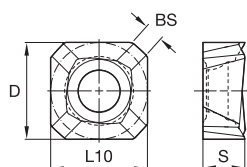
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	...20	TN6540	...31	WP40PM	...31	WP40PM
P3-P4	...20	TN7535	...31	WP35CM	...31	WP35CM
P5-P6	...20	TN7535	...31	WP35CM	...31	WP35CM
M1-M2	...20	TN6540	...31	WP25PM	...31	WP25PM
M3	...20	TN7535	...31	WP35CM	...31	WP35CM
K1-K2	...21	WK15CM	...31	WK15CM	...31	WK15CM
K3	...21	WK15CM	...31	WP35CM	...31	WP35CM
N1-N2	-	-	-	-	-	-
N3	-	-	-	-	-	-
S1-S2	...20	TN6540	...31	WP25PM	...31	WP25PM
S3	-	-	-	-	-	-
S4	...20	TN6540	...31	WP40PM	...31	WP25PM
H1	-	-	-	-	-	-

Inserts • SN1205..



SNKT-20
SNKT-21



● first choice
○ alternate choice

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

SNKT-20

catalog number	cutting edges	D	L10	S	BS	hm	TN6540	TN7525	TN7535	WK15CM	WP40PM	TT125	THM
SNKT435AZER20	4	.500	.500	.217	.079	.004	2964201	2022370	2020691	-	-	2022371	-

SNKT-21

catalog number	cutting edges	D	L10	S	BS	hm	TN6540	TN7525	TN7535	WK15CM	WP40PM	TT125	THM
SNKT435AZR21	4	.500	.500	.219	.061	.006	-	2022373	-	5427383	-	2022374	2022375

■ Recommended Starting Speeds [SFM]

Face Mills

Material Group		TN6525			TN6540			TN7525			TN7535		
P	1	1340	1045	925	1180	925	785	1340	1025	925	1790	1555	1460
	2	1045	830	710	830	630	550	1025	830	710	1105	1000	905
	3	925	710	610	710	550	450	925	710	610	1000	905	805
	4	770	550	475	590	430	355	770	550	475	750	690	630
	5	1025	770	650	785	590	490	1025	770	650	1025	905	830
	6	670	535	430	535	395	335	670	535	430	630	535	430
M	1	630	395	260	430	260	200	805	725	610	805	725	610
	2	395	260	155	260	155	140	725	630	550	725	630	550
	3	415	260	180	275	155	140	570	510	450	570	510	450
K	1	905	805	725	725	670	590	1240	925	785	1165	1045	940
	2	710	630	590	570	510	450	1060	785	650	925	830	750
	3	590	535	475	510	475	415	785	650	550	770	690	630
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	155	120	95	–	–	–	–	–	–
	2	–	–	–	80	60	40	–	–	–	–	–	–
	3	–	–	–	235	140	95	–	–	–	–	–	–
	4	–	–	–	200	95	80	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [SFM] — continued)

Material Group		WK15CM			WP40PM			TTI25			THM		
P	1	—	—	—	1165	1025	965	1415	1180	985	—	—	—
	2	—	—	—	985	845	710	1025	830	710	—	—	—
	3	—	—	—	905	770	630	1025	830	710	—	—	—
	4	—	—	—	805	670	535	865	710	590	—	—	—
	5	—	—	—	670	610	535	1045	770	650	—	—	—
	6	—	—	—	590	450	355	475	355	295	—	—	—
M	1	—	—	—	770	670	610	1570	1025	710	—	—	—
	2	—	—	—	690	590	490	1060	670	475	—	—	—
	3	—	—	—	510	450	355	1045	690	475	—	—	—
K	1	1655	1520	1340	—	—	—	725	610	510	475	355	295
	2	1320	1165	1080	—	—	—	590	475	415	490	395	275
	3	1105	985	905	—	—	—	475	415	335	510	370	235
N	1	—	—	—	—	—	—	—	—	—	3540	2365	1970
	2	—	—	—	—	—	—	—	—	—	2695	1830	1520
	3	—	—	—	—	—	—	—	—	—	1770	1105	785
S	1	—	—	—	155	140	120	—	—	—	—	—	—
	2	—	—	—	155	140	120	—	—	—	—	—	—
	3	—	—	—	200	155	120	—	—	—	—	—	—
	4	—	—	—	260	200	140	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

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

Recommended Starting Feeds

■ Recommended Starting Feeds [IPT]

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

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
...20	.007	.026	.047	.005	.018	.033	.004	.014	.025	.003	.012	.022	.003	.011	.020	...20
...21	.010	.029	.049	.007	.021	.035	.005	.016	.026	.005	.014	.023	.004	.013	.021	...21
...31	.010	.030	.050	.007	.022	.036	.006	.016	.027	.005	.014	.023	.004	.013	.021	...31

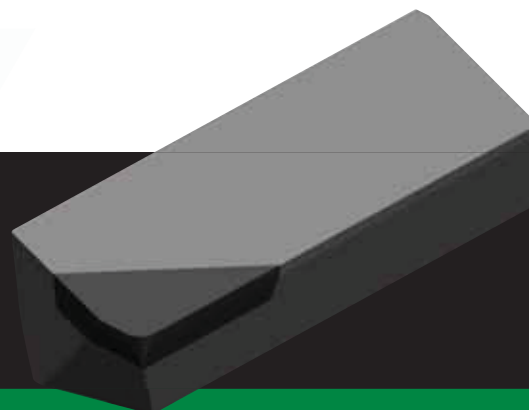
NOTE: Use "Light Machining" value as starting feed rate.

Indexable Milling •

SuperFeed™

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

SuperFeed



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

- Durable cutter body protection.
- Five PCD cartridge options for increased flexibility.
- User-friendly axial adjustment .012–.030" (0,3–0,8mm).
- Reduce overall tooling costs with reconditioning options.

Features	Benefits
• Anodized aluminum cutter bodies.	• Durable and lightweight.
• Easy axial adjustment range .012–.032".	• Simple and very user-friendly.
• DovLok PCD cartridge design.	• Proven in demanding automotive applications.
• Fine pitch cutters.	• Shorter cycle times, higher MRR and productivity.



Face Mills



SuperFeed™

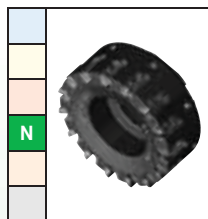
Max depth of cut: .250"
(can be less depending on the cartridge)

Lead angle: 0°

Indexes per insert: 1 edge per PCD cartridge

Diameter: Standard Platform
2.5–8"

Pages: H58–H62



■ Insert Offering



SDR/EDR

Corner Radii:

SDR — .031" and .093"
EDR — .031"

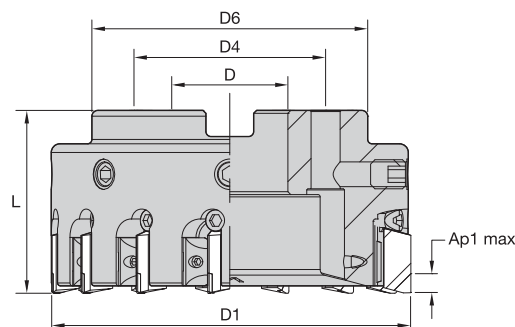
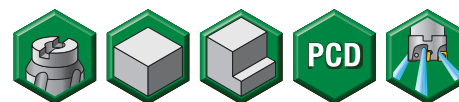
Axial DOC:

SDR — .250" max
EDR — .250" max

WIDIA™ Grade WDN00U™:

- Ultra fine grain PCD.
- Long tool life, consistent results, excellent surface qualities.

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

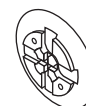
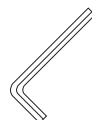


■ Face Mills • Inch

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
5363040	SF02506RH	2.50	1.00	—	2.38	2.00	.25	6	6	1.00	20000
5363041	SF0308RH	3.00	1.00	—	2.88	2.00	.25	8	8	1.40	20000
5363042	SF0412RH	4.00	1.25	—	3.88	2.00	.25	12	12	2.50	17320
5363043	SF0515RH	5.00	1.50	—	4.88	2.38	.25	15	15	5.10	15500
5363044	SF0618RH	6.00	1.50	—	5.88	2.38	.25	18	18	7.00	14150
5363045	SF0824RH	8.00	2.50	4.00	7.94	2.38	.25	24	24	9.30	12240

NOTE: Z = Number of cartridges
Z ADJ = Number of adjustable cartridges

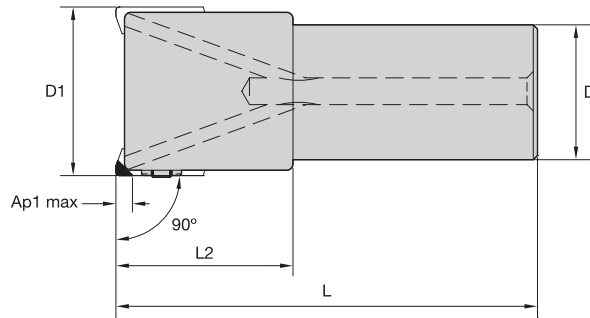
■ Spare Parts



D1	wedge screw	wrench size wedge screw	adjusting screw	wrench size-adjusting screw	coolant cap	coolant shower plate	wedge
2.50	DLS6	3/32	SWS38	.156	SALS25	—	HDW6EU4DD
3.00	DLS6	3/32	SWS38	.156	SALS30	—	HDW6EU4DD
4.00	DLS6	3/32	SWS38	.156	SALS40	—	HDW6EU4DD
5.00	DLS6	3/32	SWS38	.156	SALS50	—	HDW6EU4DD
6.00	DLS6	3/32	SWS38	.156	SALS6150	—	HDW6EU4DD
8.00	DLS6	3/32	SWS38	.156	—	SSP8	HDW6EU4DD

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

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



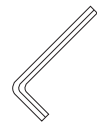
Face Mills

■ End Mills • Inch

order number	catalog number	D1	D	L2	L	Ap1 max	Z	Z ADJ	lbs	max RPM
5363198	WSSEM1002RH	1.00	.75	1.50	3.50	.25	2	2	0.50	35500
5363199	WSSEM12503RH	1.25	1.00	1.75	4.00	.25	3	3	1.20	31700
5363250	WSSEM1504RH	1.50	1.00	1.75	4.00	.25	4	4	1.15	29000
5363251	WSSEM2005RH	2.00	1.00	1.70	4.50	.25	5	5	1.10	25100

NOTE: Z = Number of cartridges
Z ADJ = Number of adjustable cartridges

■ Spare Parts

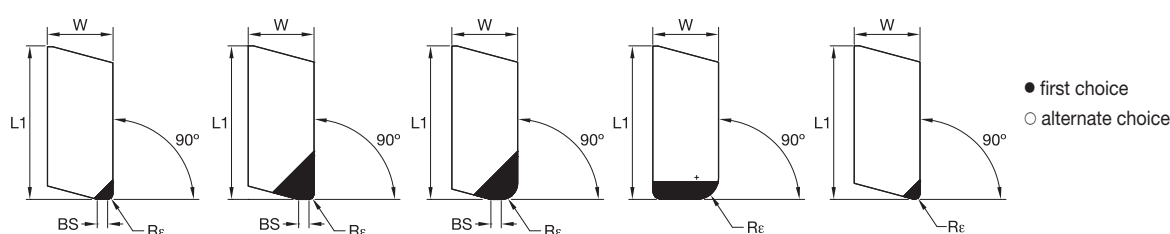


D1	wedge screw	wrench size wedge screw	wedge	adjusting screw	wrench size-adjusting screw
1.00	DSI6	3/32	HDW6S	SWS32	.156
1.25	DSI6	3/32	HDW6S	SWS32	.156
1.50	DSI6	3/32	HDW6S	SWS32	.156
2.00	DSI6	3/32	HDW6S	SWS32	.156

NOTE: For setting procedure, see page H62.

Insert Selection Guide

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



P	●
M	●
K	●
N	●
S	●
H	●

PCD Inserts • Face Mills • SDR

catalog number	cutting edges	L1	BS	W	Rε	hm	WDN00U
SDR100031E0W4	1	.850	.06	.38	.031	.0008	5358407
SDR100031E1W4	1	.850	.06	.38	.031	.0008	5358408
SDR100093E1W4	1	.850	.06	.38	.093	.0008	5358409
SDR102	1	.850	—	.38	.125	.0008	5358451
SDR100031E0NW	1	.875	—	.38	.031	.0008	5358450

PCD Inserts • End Mills • EDR

catalog number	cutting edges	L1	BS	W	Rε	hm	WDN00U
EDR100031E1W4	1	.850	.06	.25	.031	.0008	5358452

NOTE: hm = Average chip thickness; BS = Wiper facet length; E0 = 0.100" Ap1 max ; E1 = 0.250" Ap1 max.

■ Recommended Starting Speeds [SFM]

Material Group		WDN00U		
P	1	–	–	–
	2	–	–	–
	3	–	–	–
	4	–	–	–
	5	–	–	–
	6	–	–	–
M	1	–	–	–
	2	–	–	–
	3	–	–	–
K	1	–	–	–
	2	–	–	–
	3	–	–	–
N	1–2	3000	6500	16000
	3	1500	2000	2500
S	1	–	–	–
	2	–	–	–
	3	–	–	–
	4	–	–	–
H	1	–	–	–

Recommended Starting Feeds

■ Recommended Starting Feeds [IPT]

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

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50–100%			
SDR...	.003	.007	.011	.003	.005	.008	.002	.004	.007	.002	.004	.006	.002	.004	.006	SDR...
EDR...	.003	.007	.011	.003	.005	.008	.002	.004	.007	.002	.004	.006	.002	.004	.006	EDR...

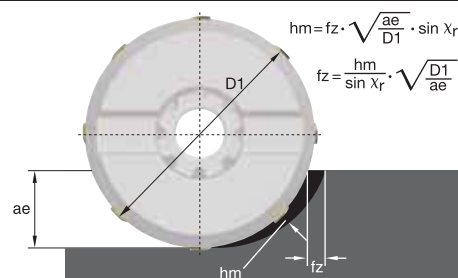
NOTE: First choice starting feed (fz) is in **bold** type.

Use corresponding speed (vc).

fz and vc are valid for $ae \geq 0.4 D1$.

For smaller ae, fz and vc should be multiplied by the factor given below:

ae/D1 =	0.2	0.3	0.4
fz-Factor	1.5	1.3	1.0
vc-Factor	1.3	1.2	1.1



■ General

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

■ Face Mills

- Apply a small amount of lubricant to the following areas:
 - Pocket area where the wedge slides.
 - Threads of the cartridge locking screw.
 - Threads of the axial adjustment screw.
- Install cartridges applying light torque to the wedge assembly locking screw.
- Turn axial adjustment screw until the cartridge is .0004–.0006" (0,01–0,015mm) below the final set height.
- Tighten the wedge assembly locking screw to 35 in/lbs (4 Nm).
- Turn the axial adjustment screw moving the PCD cartridge .0002" (0,005mm) to the final set height position.
- Set all cartridges as above.

■ End Mills

- Apply a small amount of lubricant to the following areas:
 - Threads of the cartridge locking screw.
 - Threads of the axial adjustment screw.
- Install cartridges applying light torque to the locking screws.
- Turn axial adjustment screw until the cartridge is .0004–.0006" (0,01–0,015mm) below the final set height.
- Tighten the locking screw (left-hand threads) to 70 in/lbs (8 Nm) leaving .0002" (0,005mm) below the final set height.
- Turn the axial adjustment screw moving the PCD cartridge .0002" (0,005mm) to the final set height position.
- Set all cartridges as above.

Making the Grade in Innovative Metalcutting Technology



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

Victory™ Milling Grades

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

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

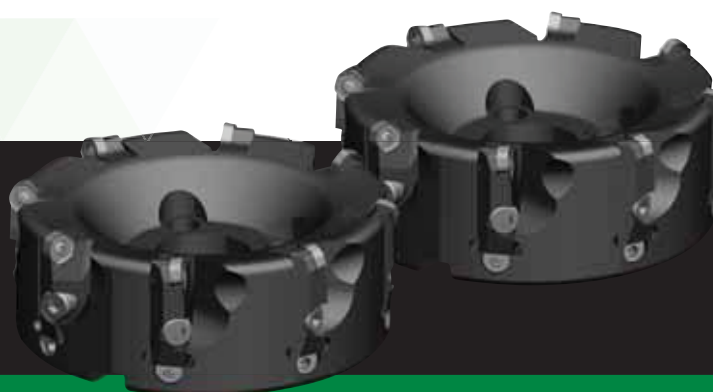
To learn more about the benefits of the new **WIDIA™ Victory Milling Grades**, contact your local distributor.

WIDIA 

Roughing and Finishing with a Single Tool •

WIDIA™ M4000

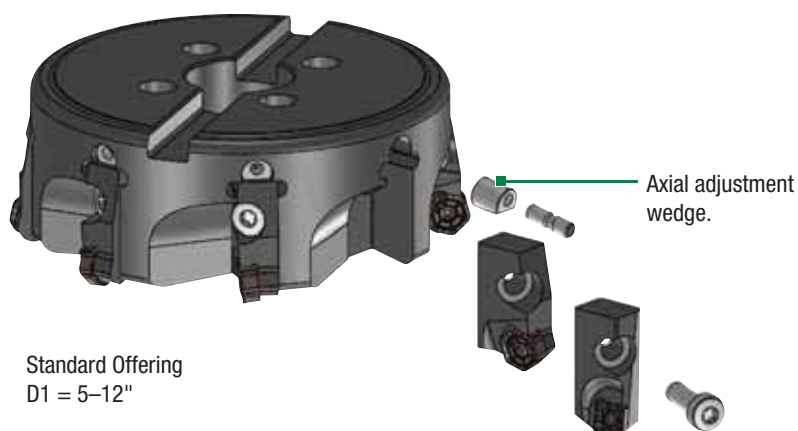
M4000



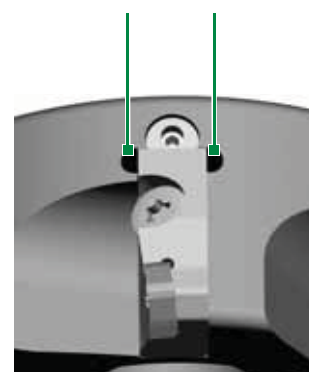
Cartridges with different insert styles and lead angles can be easily changed.

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

Roughing and Finishing with a Single Tool



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



Face Mills

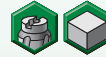


M4000 Cartridge Milling System

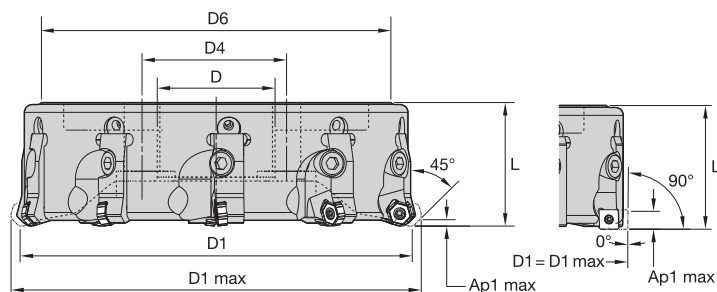
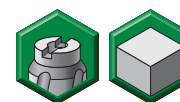
All front line insert styles available.

Diameter: 6–12"

Pages: H66–H68



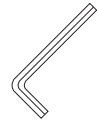
- Roughing and finishing with one single tool.
- Quick cartridge stop feature.
- Easy runout adjustment.
- Easy change of cartridges with different insert styles and lead angles.



■ Cartridge Milling System

order number	catalog number	D1	D	D4	D6	L	number of cartridges	coolant supply	lbs
4136312	M4000D600Z08ADJ	6.000	2.000	—	5.394	2.480	8	No	9.73
4136353	M4000D600Z12ADJ	6.000	2.000	—	5.394	3.150	12	No	13.53
4136358	M4000D1200Z16ADJ	12.000	2.500	4.000	11.260	3.150	16	No	50.57
4136359	M4000D1200Z22ADJ	12.000	2.500	4.000	11.260	3.150	22	No	50.42

■ Spare Parts

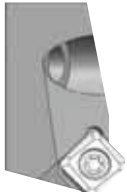
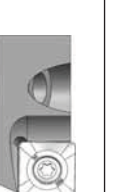
D1	 cartridge screw	 in. lbs.	 wedge	 adjusting screw	 hex wrench
6.000	MS1294	177	12748308500	12748600900	MW3
12.000	MS1294	177	12748308500	12748600900	MW3

■ Cartridge

order number	catalog number	insert style	master platform *	Ap1 max
4159022	M4000CA-AD1505	AD.T1505	CIP	.55
4159020	M4000CA-AP1003	AP.T1003	CIP	.40
4159021	M4000CA-AP1604	AP.T1604	CIP	.63
3968124	M4000CA-HN07	HN.J0704/XNGJ0704	M1200 Mini	.14
4159018	M4000CA-HN07HD	HN.J0704	M1200 Mini	.18
4159017	M4000CA-HN07HF	HN.J0704	M1200 Mini	.04
3126691	M4000CA-HN09	HN.J0905/XNGJ0905	M1200	.17
4159019	M4000CA-HN09HD	HN.J0905	M1200	.24
3954792	M4000CA-HN09HF	HN.J0905	M1200	.05
2511344	M4000CA-HP06	HP.T06T3	M640	.19
2006361	M4000CA-MDHX10	MDHX1004	—	.04
2006346	M4000CA-RC1606	RC.T1606	M100	.31
2067492	M4000CA-SD1204	SDM.1204	M690	.46
2006359	M4000CA-SD1506	SDM.1506	M690	.59
2006374	M4000CA-SE1203	SE.N1203/SE.R1203	M68	.23
2033495	M4000CA-SE1204	SE.N1204/SE.R1204	M68	.23
2006377	M4000CA-SE1504	SE.N1504/SE.R1504	M68	.31
2006348	M4000CA-SN12	SN.T1205/XNKT1205	M660	.25
2006357	M4000CA-SN12RC	SN.T1205	M660	.25
2006360	M4000CA-SN15	SN.T1505	M660	.31
2006362	M4000CA-SP12	121358680	M40Wiper	.35
2006373	M4000CA-SP1203	SP.N1203/SP.R1203	M40	.35
2006376	M4000CA-SP1504	SP.N1504	M40	.47
2033496	M4000CA-TP1603	TP.N1603/TP.R1603	M40	.47
2006379	M4000CA-TP2204	TP.N2204/TP.R2204	M40	.71
2006347	M4000CA-XP16	XP.T1604	M680	.55

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

								
	M4000CA-MDHX10CA	M4000CA-HN07HF	M4000CA-HN07	M4000CA-HN07HD	M4000CA-HN09HF	M4000CA-HN09	M4000CA-HN09HD	M4000CA-HP06
	order number 2006361	order number 4159017	order number 3968124	order number 4159018	order number 3954792	order number 3126691	order number 4159019	order number 2511344
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
6.000	6.000	6.850	6.654	6.575	7.008	6.732	6.614	6.551
12.000	12.000	12.953	12.756	12.678	13.110	12.835	12.717	12.654

									
	M4000CA-SN12	M4000CA-SN12RC	M4000CA-SN15	M4000CA-XP16	M4000CA-AP1003	M4000CA-AD1505	M4000CA-AP1604	M4000CA-SD1204	M4000CA-SD1506
	order number 2006348	order number 2006357	order number 2006360	order number 2006347	order number 4159020	order number 4159022	order number 4159021	order number 2067492	order number 2006359
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
6.000	6.862	6.862	7.008	6.000	6.000	6.000	6.000	6.000	6.000
12.000	12.965	12.965	13.110	12.000	12.000	12.000	12.000	12.000	12.000

									
	M4000CA-RC1606	M4000CA-SE1203	M4000CA-SE1204	M4000CA-SE1504	M4000CA-SP1203	M4000CA-SP12 Wiper	M4000CA-SP1504	M4000CA-TP1603	M4000CA-TP2204
	order number 2006346	order number 2006374	order number 2033495	order number 2006377	order number 2006373	order number 2006362	order number 2006376	order number 2033496	order number 2006379
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
6.000	6.000	6.850	6.850	7.008	6.520	6.583	6.583	6.000	6.000
12.000	12.000	12.953	12.953	13.110	12.622	12.685	12.685	12.000	12.000