

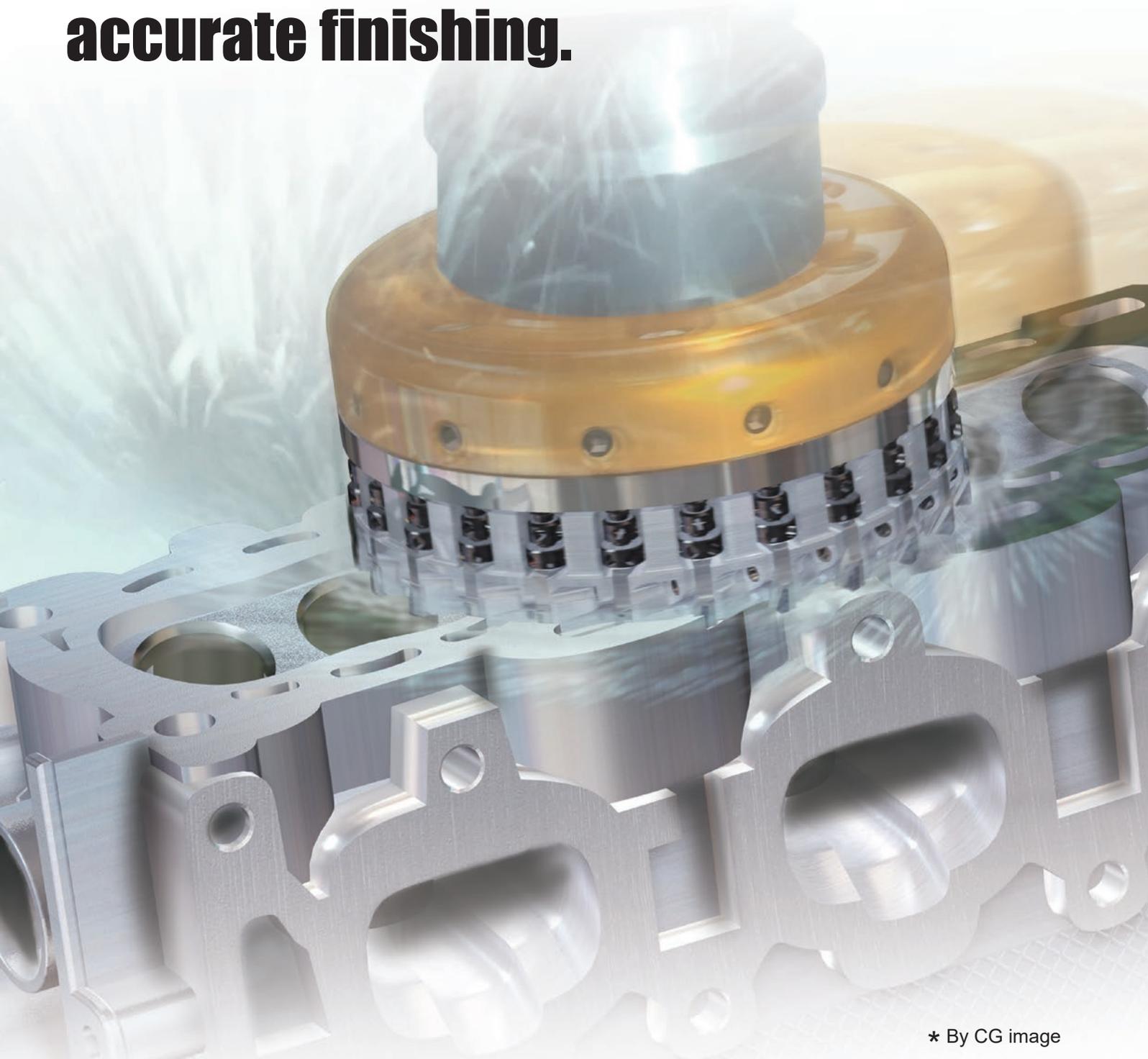
High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

Environmentally Friendly Product

# FMAX

Series  
Expansion

**Feed Maximum (FMAX)**  
milling cutter for ultra efficient,  
accurate finishing.



\* By CG image



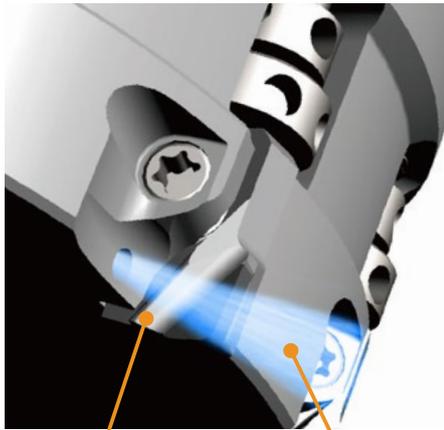
Please refer to the last page for more information on certified environmentally friendly products.

# High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

# FMAX

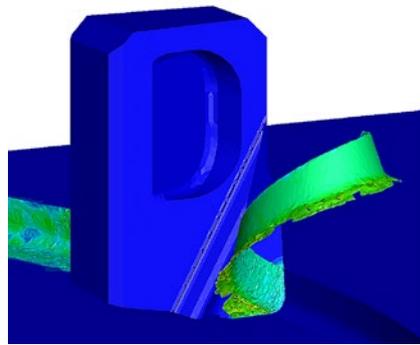
## Ultra High Efficiency Machining

The ultra fine pitch design is ideal for high efficiency machining of aluminium alloys. (vf ≥ 20000 mm/min).



Body Protector

Internal Coolant

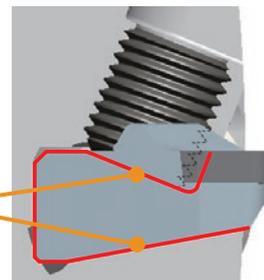


\*Graphical Representation.

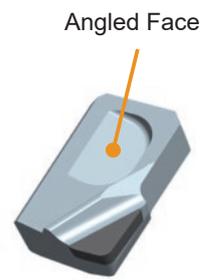
The body protector on the rake face forms chip shapes ideal for disposal and disperses them away from the body. Internal coolant also aids this process. The body is compatible with all centre through coolant arbors.

## Designed for High Speeds

Anti fly dovetail clamping mechanism.



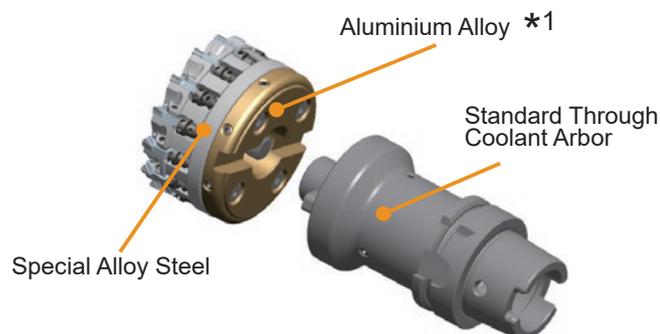
Dovetail Clamp



Angled Face

## Light Weight, High Rigidity Body

A special alloy steel and aluminium body combine to provide rigidity and light weight.



Aluminium Alloy \*1

Standard Through Coolant Arbor

Special Alloy Steel

\*1 Except DC=40, 50, 63mm

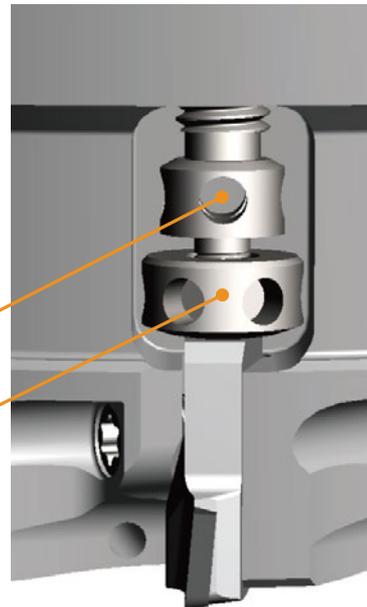
## High Precision, Easy Setting

The combination of both large pitch and micro pitch screws provides precise run-out adjustment and for accurate placing of new or re-ground inserts within 5  $\mu\text{m}$  or better.



Large Adjustment Screw

Micro Adjustment Nut



## Economy, Multi-use

CBN inserts for cast iron machining do not require regrinding (disposable type), making tool management easy.

PCD inserts for aluminium alloy machining have a maximum regrinding amount of 0.6mm on both the peripheral and bottom edges.



DC = 40, 50, 63mm



For Milling Aluminium Alloys  
PCD Grades  
(GAMP: +5°)



For Milling Cast Iron  
CBN Grades  
(GAMP: 0°)

# High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

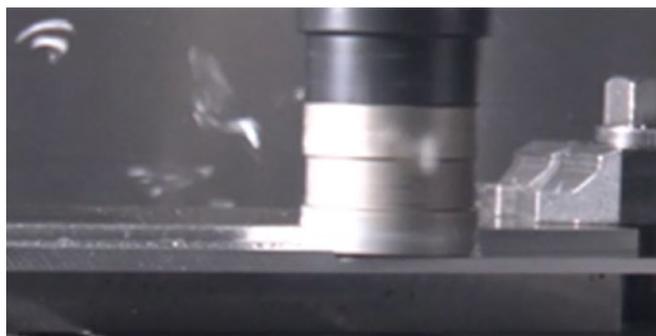
# FMAX

## CLASSIFICATION

Series	Use	Specifications	DCON MS	Minimum			Maximum		
				DC	Number of Teeth	WT(kg)	DC	Number of Teeth	WT(kg)
FMAX	High Feed Finish Milling Cutter	Light Weight, High Rigidity Body	inch	80	10	1.11	160	16	3.30
					14	1.09		24	3.39
		Alloy Steel and Aluminium Body	mm	80	14	1.08	125	24	3.26
FMAX-LW	High Feed Finish Milling Cutter	Light Weight, High Rigidity Body	inch	100	10	1.06	125	14	1.44
	For Compact and Smaller Machining Centres	Alloy Steel and Aluminium Body			16	1.11		20	1.48
FMAX-40/50/63	High Feed Finish Milling Cutter	Alloy Steel Body	mm	40	4	0.24	63	10	0.67
	Small Diameter				6	0.23		12	0.66
NEW FMAX-MB	For Low Rigidity Conditions	Alloy Steel Body	inch	80	4	1.14	125	6	3.82
		Coarse Pitch Type	mm	50	4	0.38	125	6	3.81

## NEW FMAX-MB

By reducing the number of teeth finishing can be easily performed even if the machine or work material is not rigid. Tool installation costs can also be reduced while maintaining the existing insert mounting and cutting edge adjustment functions.



## FMAX-LW

It can be used for compact and smaller machining centres while maintaining the conventional insert mounting function and cutting edge adjustment function.



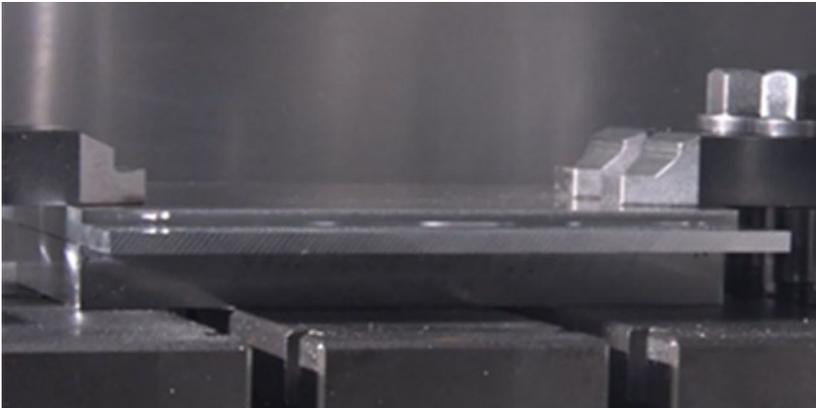
Please refer to the last page for more information on certified environmentally friendly products.

## Cutting Performance

### Surface Finish Comparison of Thin Plate Machining A5052

The new coarse pitch type FMAX lessens chattering and vibration and is ideal for producing a good surface finish on low rigidity set ups.

### Machining Condition



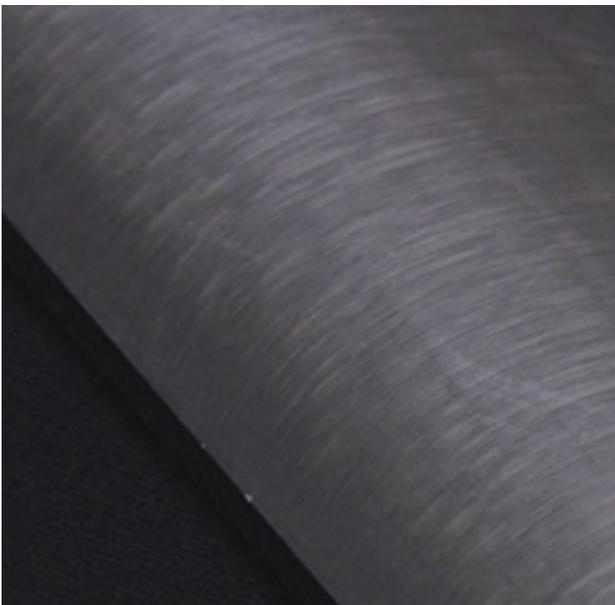
<Common Cutting Conditions>

Workpiece Material : A5052  
Diameter : DC=50mm  
Cutting Speed : vc=3140m/min  
Feed per Tooth : fz=0.1mm/t.  
Depth of Cut : ap=2mm  
Width of Cut : ae=40mm  
Cutting Mode : Dry Cutting

### **FMAX** Coarse Pitch Type

<Cutting Conditions>

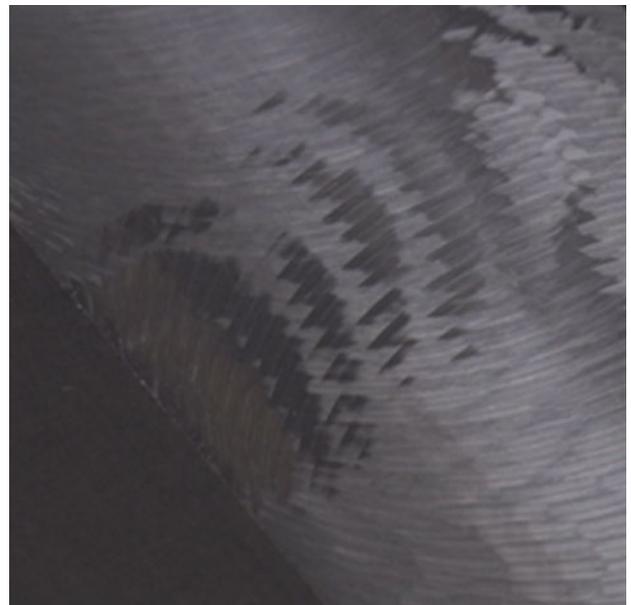
Number of Teeth : 4  
Feed per Tooth : vf=8000 mm/min



### **FMAX** Standard Type

<Cutting Conditions>

Number of Teeth : 10  
Feed per Tooth : vf=20000 mm/min



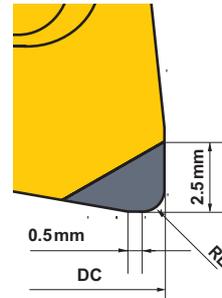
# Inserts for Specific Applications

## CBN Grades for Milling Gray Cast Iron

### General Purpose Inserts

CBN inserts for gray cast iron reduce the length of the wiper edge and provides excellent component surface finishes with low cutting forces.

CBN inserts for cast iron machining do not require regrinding because they are a disposable type.

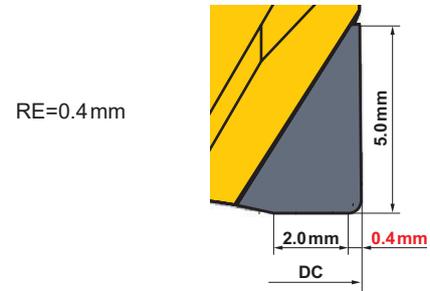
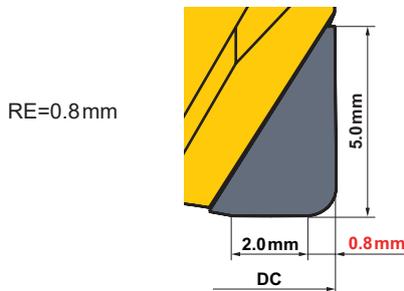


## PCD Grades for Milling Aluminium Alloys

### General Purpose Inserts

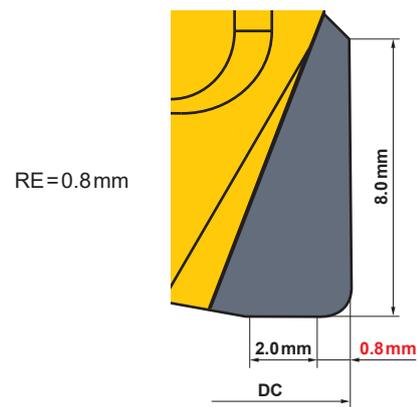
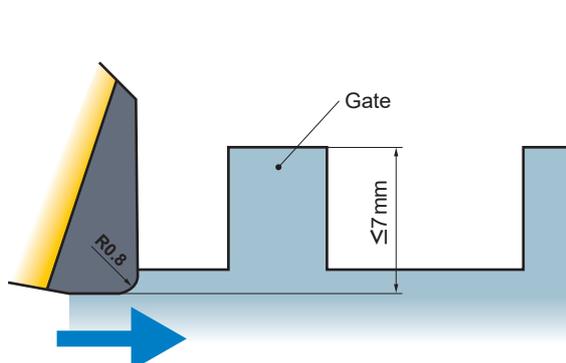
Inserts with corner  $R(RE) = 0.8 \text{ mm}$  are excellent for general applications, and can be used in a wide variety of cutting areas. They are able to exhibit outstanding cutting edge stability, particularly under high-load conditions such as heavy interrupted cutting.

The sharpness of inserts with corner  $R(RE) = 0.4 \text{ mm}$  is one of their most notable features. Its effectiveness can be demonstrated by the ability to suppress chatter and maintain excellent finished component surfaces.



### Long Edge Inserts

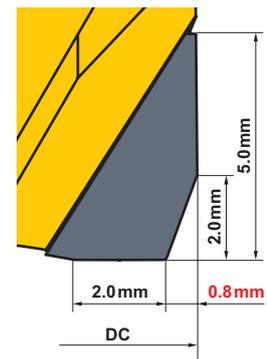
The long edge insert is capable of finish cutting of castings with a gate. Therefore, it is possible to reduce the number of cutting passes and also shortens the machining time.



## Burr Prevention Inserts

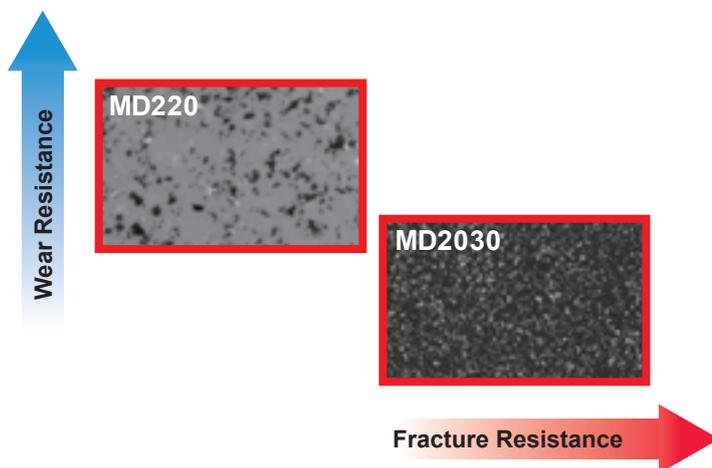
The tool cutting edge angle is effective at reducing the thickness of chips, with almost no burrs generated in comparison to conventional products. The finely-detailed R shape of the corner portion prevents chipping and enhances both stability and tool life.

Burr Prevention Type

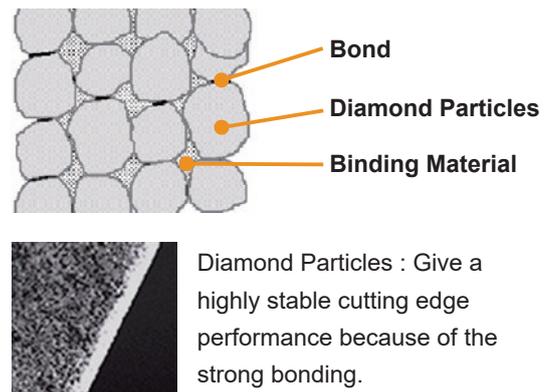


## Features of the Grades

### PCD Grade Diamond Sintered Segment Containing Ultra Microparticle Diamond



### Bonding of Diamond Particles



### Features of MD2030

Designed for milling, gives improved fracture resistance when used in unstable applications. The stability of the cutting edge can meet a wide variety of workpiece material and cutting conditions.

### Features of MD220

Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. MD220 can prevent burr formation and achieve long tool life.

## CBN Grade High Fracture Resistance

### Features of MB4120

Fine CBN particles increase edge toughness and the high fracture resistance provides stability. The ideal grade for preventing fracturing, edge chipping and thermal cracks. Also capable of use when there is coolant remaining on the component from the preceding machining operation.

# High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

## FACE MILLING <HIGH FEED FINISHING>



### FMAX

- P M **K** N S H



Fig.1  
ø80  
ø160

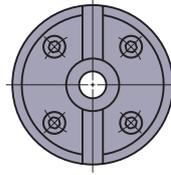
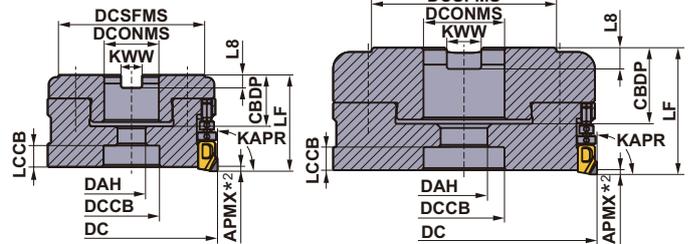
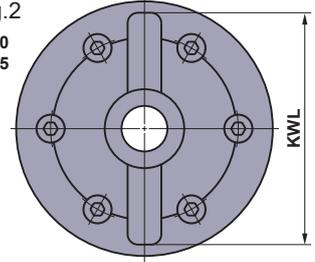


Fig.2  
ø100  
ø125



Right hand tool holder only.

### Arbor Type

DCONMS = inch size

DC	Order Number	Stock	Coolant Hole	No.T	LF	DCONMS	WT (kg)	RPMX (min <sup>-1</sup> )	Fig.
80	FMAXR08010C	●	○	10	45	25.4	1.11	24500	1
80	FMAXR08014C	●	○	14	45	25.4	1.09	24500	1
100	FMAXR10012D	●	○	12	50	31.75	1.85	22000	2
100	FMAXR10018D	●	○	18	50	31.75	1.81	22000	2
125	FMAXR12516E	●	○	16	60	38.1	3.33	19600	2
125	FMAXR12524E	●	○	24	60	38.1	3.27	19600	2
160	FMAXR16016D	●	○	16	63	31.75	3.30	10000	1
160	FMAXR16024D	●	○	24	63	31.75	3.39	10000	1

\*1 Number of Teeth

\*2 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

Note 1) The maximum depth of cut should be 2mm or less for ultra high efficiency machining with a table feed of (vf ≥ 20000 mm/min).

### Mounting Dimensions

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4	80	FMAXR08010C	24	13	26	11	68	9.5	6	—	1
25.4	80	FMAXR08014C	24	13	26	11	68	9.5	6	—	1
31.75	100	FMAXR10012D	32	17	32	10	79	12.7	8	90	2
31.75	100	FMAXR10018D	32	17	32	10	79	12.7	8	90	2
38.1	125	FMAXR12516E	36	22	38	12	88	15.9	10	112	2
38.1	125	FMAXR12524E	36	22	38	12	88	15.9	10	112	2
31.75	160	FMAXR16016D	38	17	53	10	75	12.7	8	—	1
31.75	160	FMAXR16024D	38	17	53	10	75	12.7	8	—	1

### Spare Parts

DC	Tool Holder Type	Insert Clamp Screw	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
80	FMAXR080	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	FMAXR100	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	FMAXR125	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S
160	FMAXR160	TSS04505S	KSN3	KSS2	HSCX16045H	TKY10T	RKY25S

\* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.



Fig.1  
ø80

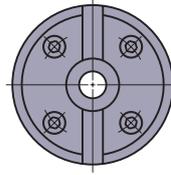
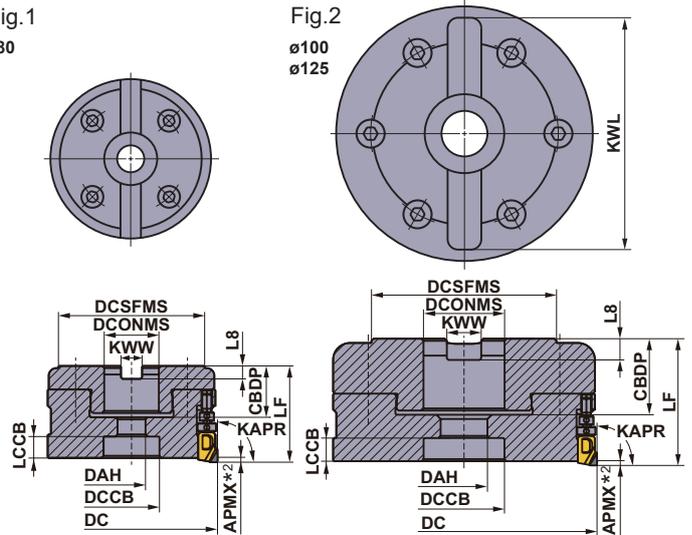


Fig.2  
ø100  
ø125



Right hand tool holder only.

## Arbor Type

DCONMS = mm size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T	LF	DCONMS	WT (kg)	RPMX (min <sup>-1</sup> )	Fig.
80	<b>FMAX-080B14R</b>	●	○	14	45	27	1.08	24500	1
100	<b>FMAX-100B18R</b>	●	○	18	50	32	1.81	22000	2
125	<b>FMAX-125B24R</b>	●	○	24	60	40	3.26	19600	2

\*1 Number of Teeth

\*2 For the maximum depth of cut (**APMX**), please refer to the recommended cutting conditions (**ap**).

Note 1) The maximum depth of cut should be 2 mm or less for ultra high efficiency machining with a table feed of (**vf** ≥ 20000 mm/min).

## Mounting Dimensions

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
27	80	<b>FMAX-080B14R</b>	24	13	26	11	68	12.4	7	—	1
32	100	<b>FMAX-100B18R</b>	32	17	32	10	79	14.4	8	90	2
40	125	<b>FMAX-125B24R</b>	36	22	38	12	88	16.4	9	112	2

## Spare Parts

(mm)

DC	Tool Holder Type	Insert Clamp Screw*	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
80	<b>FMAX-080</b>	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	<b>FMAX-100</b>	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	<b>FMAX-125</b>	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

\* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.

# High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

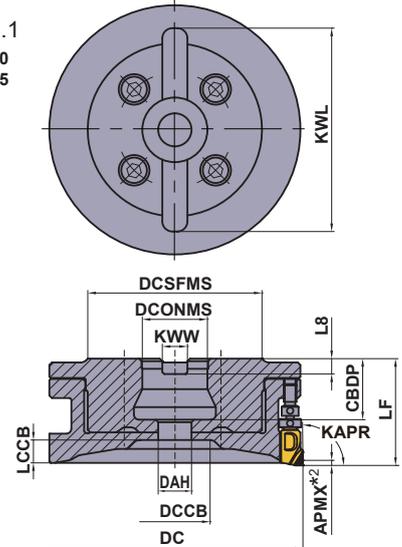
## FACE MILLING <HIGH FEED FINISHING>



## FMAX-LW For Compact and Smaller Machining Centres



Fig. 1  
ø100  
ø125



Right hand tool holder only.

### Arbor Type

DCONMS = inch size

DC	Order Number	Stock	Coolant Hole	No.T	LF	DCONMS	WT (kg)	RPMX (min <sup>-1</sup> )	Fig.
100	FMAXR10010CLW	●	○	10	42	25.4	1.06	22000	1
100	FMAXR10016CLW	●	○	16	42	25.4	1.11	22000	1
125	FMAXR12514CLW	●	○	14	42	25.4	1.44	19600	1
125	FMAXR12520CLW	●	○	20	42	25.4	1.48	19600	1

\*1 Number of Teeth

\*2 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with a table feed of (vf ≥ 20000mm/min).

### Mounting Dimensions

DCONMS	DC	Order Number	CBDB	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4	100	FMAXR10010CLW	24	13	27	9	68	9.5	6	80	1
25.4	100	FMAXR10016CLW	24	13	27	9	68	9.5	6	80	1
25.4	125	FMAXR12514CLW	24	13	52	9	68	9.5	6	80	1
25.4	125	FMAXR12520CLW	24	13	52	9	68	9.5	6	80	1

### Spare Parts

Insert Clamp Screw	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S

\* Clamp Torque (N · m) : TSS04505S = 3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.

# FACE MILLING

<HIGH FEED FINISHING>

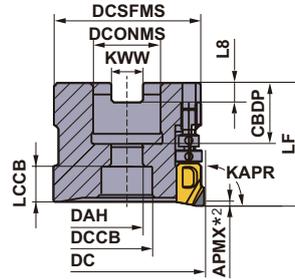


## FMAX-40/50/63

- P M **K** N S H



Fig.1  
ø40  
ø50  
ø63



Right hand tool holder only.

### Arbor Type

DCONMS = mm size

DC	Order Number	Stock	Coolant Hole	No.T	LF	DCONMS	WT (kg)	RPMX (min <sup>-1</sup> )	Fig.
40	FMAX-040A04R	●	○	4	40	16	0.24	30000	1
40	FMAX-040A06R	●	○	6	40	16	0.23	30000	1
50	FMAX-050A08R	●	○	8	40	22	0.37	30000	1
50	FMAX-050A10R	●	○	10	40	22	0.35	30000	1
63	FMAX-063A10R	●	○	10	40	22	0.67	27000	1
63	FMAX-063A12R	●	○	12	40	22	0.66	27000	1

\*1 Number of Teeth

\*2 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with a table feed of (vf ≥ 20000 mm/min).

### Mounting Dimensions

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
16	40	FMAX-040A04R	18	9	14	10	37	8.4	5.6	—	1
16	40	FMAX-040A06R	18	9	14	10	37	8.4	5.6	—	1
22	50	FMAX-050A08R	20	11	17	12	47	10.4	6.3	—	1
22	50	FMAX-050A10R	20	11	17	12	47	10.4	6.3	—	1
22	63	FMAX-063A10R	20	11	17	12	60	10.4	6.3	—	1
22	63	FMAX-063A12R	20	11	17	12	60	10.4	6.3	—	1

### Spare Parts

DC	Tool Holder Type	Insert Clamp Screw	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
40	FMAX-040	TSS04505S	KSN3	KSS2	HSC08030H	TKY10T	RKY25S
50	FMAX-050	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
63	FMAX-063	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S

\* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.

# Finish Milling Cutter for Aluminium Alloys and Cast Iron

## FACE MILLING

<For Low Rigidity Conditions>



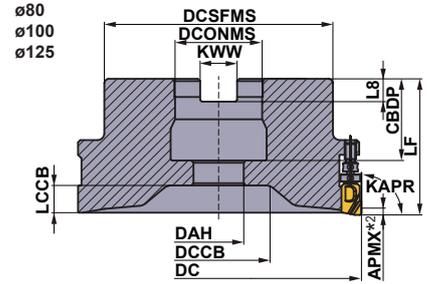
## FMAX-MB Coarse Pitch Type

NEW

- P M **K** N S H



Fig. 1



Right hand tool holder only.

### Arbor Type

DCONMS = inch size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T	LF	DCONMS	WT (kg)	RPMX (min <sup>-1</sup> )	Fig.
80	<b>FMAXR08004CMB</b>	●	○	4	45	25.4	1.14	24500	1
100	<b>FMAXR10004DMB</b>	●	○	4	50	31.75	2.01	22000	1
125	<b>FMAXR12506EMB</b>	●	○	6	60	38.1	3.82	19600	1

\*1 Number of Teeth

\*2 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

### Mounting Dimensions

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	<b>FMAXR08004CMB</b>	24	13	30	11	55	9.5	6	1
31.75	100	<b>FMAXR10004DMB</b>	32	17	39	10	75	12.7	8	1
38.1	125	<b>FMAXR12506EMB</b>	36	22	45	12	100	15.9	10	1

### Spare Parts

(mm)

DC	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Screw	Large Adjustment Screw	Cutter Clamp Bolt	Wrench T10	Wrench 2.5
80	<b>FMAXR080</b>	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	<b>FMAXR100</b>	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	<b>FMAXR125</b>	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

\* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.



Fig.1  
ø50  
ø63

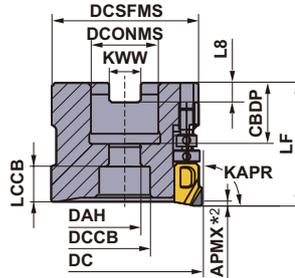
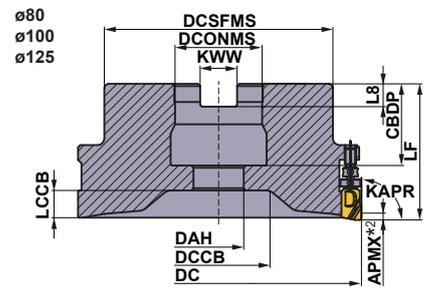


Fig.2



Right hand tool holder only.

### Arbor Type

DCONMS = mm size

(mm)

DC	Order Number	Stock	Coolant Hole	*1 No.T	LF	DCONMS	WT (kg)	RPMX (min <sup>-1</sup> )	Fig.
50	<b>FMAX-050A04R</b>	●	○	4	40	22	0.38	30000	1
63	<b>FMAX-063A04R</b>	●	○	4	40	22	0.70	30000	1
80	<b>FMAX-080B04RMB</b>	●	○	4	45	27	1.12	24500	2
100	<b>FMAX-100B04RMB</b>	●	○	4	50	32	2.00	22000	2
125	<b>FMAX-125B06RMB</b>	●	○	6	60	40	3.81	19600	2

\*1 Number of Teeth

\*2 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

### Mounting Dimensions

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
22	50	<b>FMAX-050A04R</b>	20	11	17	12	47	10.4	6.3	1
22	63	<b>FMAX-063A04R</b>	20	11	17	12	60	10.4	6.3	1
27	80	<b>FMAX-080B04RMB</b>	24	13	30	11	55	12.4	7	2
32	100	<b>FMAX-100B04RMB</b>	32	17	39	10	75	14.4	8	2
40	125	<b>FMAX-125B06RMB</b>	36	22	45	12	100	16.4	9	2

### Spare Parts

(mm)

DC	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Screw	Large Adjustment Screw	Cutter Clamp Bolt	Wrench T10	Wrench 2.5
50	<b>FMAX-050</b>	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
63	<b>FMAX-063</b>	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
80	<b>FMAX-080</b>	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	<b>FMAX-100</b>	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	<b>FMAX-125</b>	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

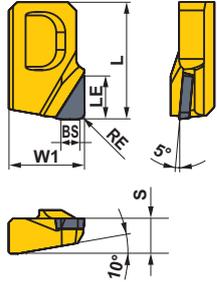
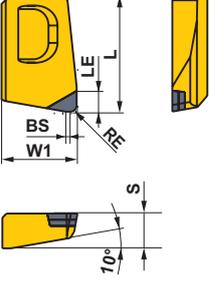
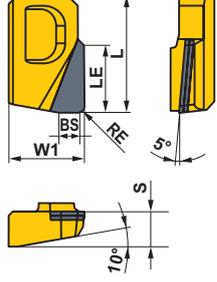
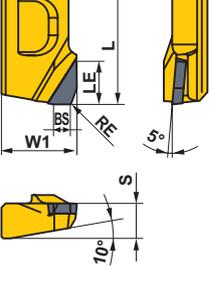
\* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.

# High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

## Inserts

(mm)

Shape	Order Number	MD220	MD2030	MB4120	L	LE	W1	S	BS	RE	Geometry
For Aluminium Alloys 	<b>GOER1404PXFR2</b>	●	●		14.0	5.0	9.0	4.2	2.0	0.4	
	<b>GOER1408PXFR2</b>	●	●		14.0	5.0	9.0	4.2	2.0	0.8	
General Purpose											
For Gray Cast Iron 	<b>NP-GOEN1404PXSR05</b>			●	14.0	2.5	9.0	4.2	0.5	0.4	
	<b>NP-GOEN1408PXSR05</b>			●	14.0	2.5	9.0	4.2	0.5	0.8	
General Purpose											
For Aluminium Alloys 	<b>GOER1408PXFR2-8</b>	●			14.0	8.0	9.0	4.2	2.0	0.8	
Long Edge											
For Aluminium Alloys 	<b>GOER1401ZXFR2</b>	●			14.0	5.0	9.0	4.2	2.0	0.1	
Burr Prevention											

For Aluminium Alloys : Sharp Edge

For Gray Cast Iron : Chamferd and Rounded (0.13mmx15°+R0.01)

Note 1) If general purpose inserts (RE = 0.4mm, 0.8mm), burr prevention inserts and long edge inserts are used together, they will not be able to sufficiently display their full performance. Inserts of the same geometry should be used according to the application.

Note 2) The cutting diameter will change depending on the insert type. Refer to page 4 for details.

Be particularly careful when cutting near vertical walls, since there is a possibility of interference with the holder.

Note 3) The long edge inserts should correspond to the height of any protrusions and gates and can not be used for constant depth cutting.

Note 4) Rake angle Axial GAMP varies depending on the insert grade. For aluminium alloy = 5°, For gray cast iron = 0°

## Recommended Cutting Conditions

(mm)

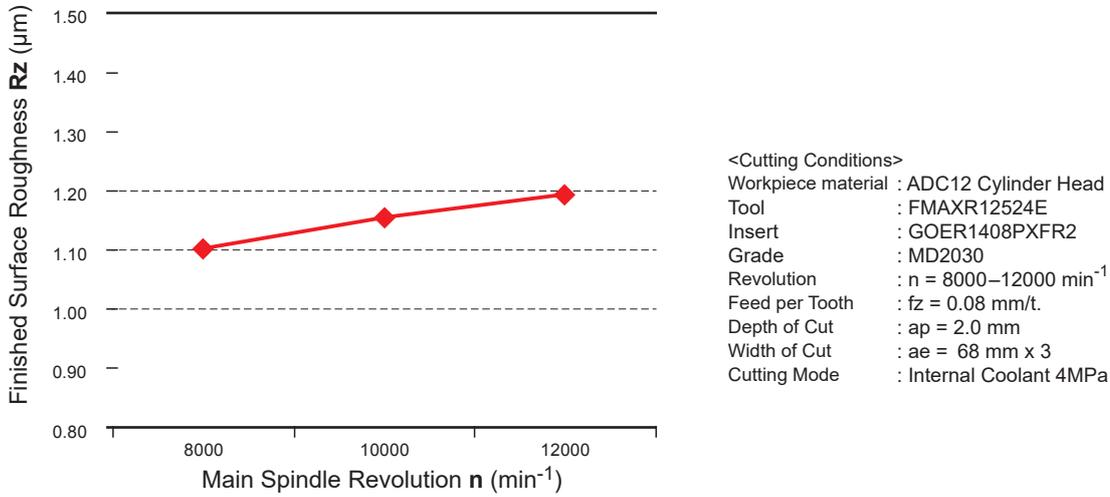
Workpiece material	Properties	Grade	vc (m/min)	Depth of Cut		fz (mm/t.)	Cutting Mode	
				ae	ap			
<b>K</b>	Gray Cast Iron	Tensile Strength ≤350MPa	<b>MB4120</b>	1000 (700—1300)	≤ 0.8 DC	≤ 0.5	0.07 (0.05—0.15)	Dry Cutting
<b>N</b>	Aluminium Alloys	Content Si < 5%	<b>MD2030</b> <b>MD220</b>	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content 5% ≤ Si ≤ 10%	<b>MD2030</b> <b>MD220</b>	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
	Content 10% < Si < 15%	<b>MD220</b> <b>MD2030</b>	600 (400—800)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting	
				≤ 0.5 DC	≤ 2.5 (0.5—2.5)			
				≤ 0.8 DC	≤ 2.0 (0.5—2.0)			
	Content Si ≥ 15%	<b>MD220</b> <b>MD2030</b>	600 (400—800)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting	
				≤ 0.5 DC	≤ 2.5 (0.5—2.5)			
				≤ 0.8 DC	≤ 2.0 (0.5—2.0)			

(Note 1) Please adjust the depth of cut **ap** depending on the width of cut **ae**.

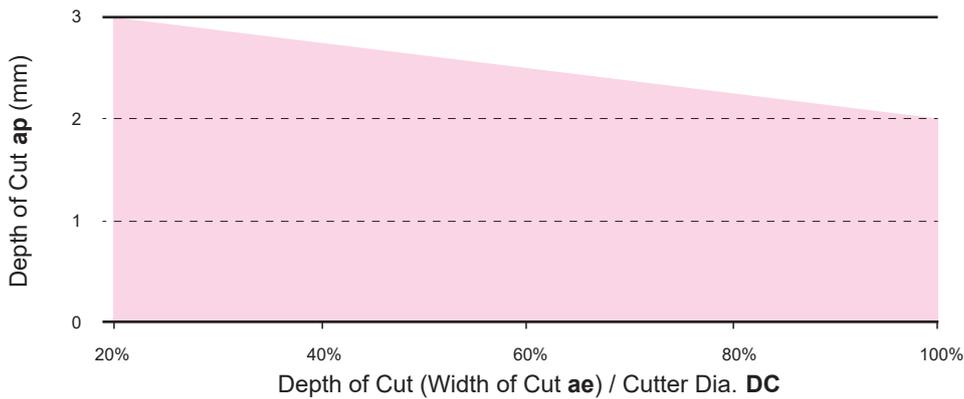
(Note 2) When using the long edge insert, please select the conditions depending on depths of cut (**ap**) excluding the depth of the gate.

## Cutting Performance

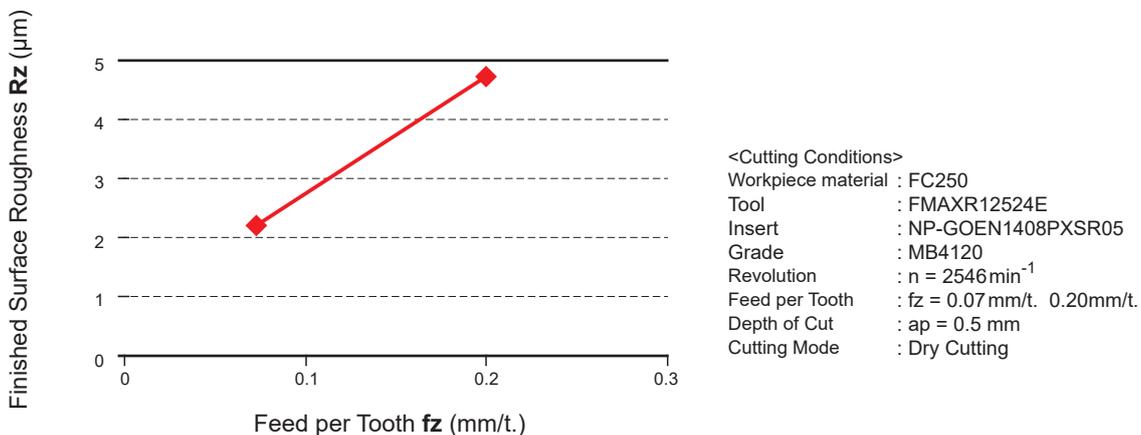
### Aluminium Alloy Finished Surface Roughness (Rz) Comparison by PCD Grade



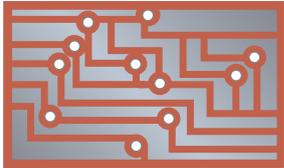
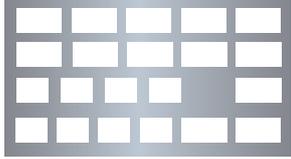
### Aluminium Alloy Effective Chip Disposal Range Comparison by PCD Grade



### Gray Cast Iron Finished Surface Roughness (Rz) Comparison by CBN Grade



## Application Examples

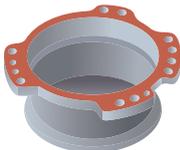
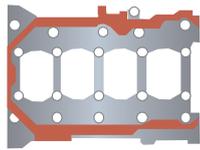
Cutter Body		FMAXR12520CLW	FMAXR16016D
Insert (Grade)		GOER1401ZXFR2 (MD220)	NP-GOEN1408PXSRO5 (MB4120)
Workpiece		Aluminium Alloy 	
Cutting Conditions	Cutting Speed <b>vc</b> (m/min)	3927(Conventional 3141)	804(Conventional 181)
	Revolution <b>n</b> (min <sup>-1</sup> )	10000(Conventional 8000)	1600(Conventional 360)
	Feed per Tooth <b>fz</b> (mm/t.)	0.09	0.1(Conventional 0.7)
	Table Feed <b>vf</b> (mm/min)	18000(Conventional 15840)	2560(Conventional 1000)
	Depth of Cut <b>ap</b> (mm)	0.5	0.2
	Width of Cut <b>ae</b> (mm)	–	110
Cutting Mode		Wet Cutting	Dry Cutting
Machine		Vertical MC (BT30)	Double Column Type MC
Results		Compared to the conventional cutting conditions, the surface roughness is maintained and the machining efficiency is improved by 15%.	Compared to conventional cemented carbide, machining efficiency is 2.5 times and cutting length is 2.7 times longer. In addition the surface finish was also good.

The above are customer's application examples, so can differ from the recommended conditions.

# High Feed Finish Milling Cutter for Aluminium Alloys and Cast Iron

## Application Examples

Cutter Body		FMAXR10018D	FMAXR08014C
Insert (Grade)		GOER1408PXFR2 (MD2030)	GOER1408PXFR2 (MD2030)
Workpiece		Aluminium Alloy 	Aluminium Alloy 
Cutting Conditions	Cutting Speed <b>vc</b> (m/min)	2513	2011
	Revolution <b>n</b> (min <sup>-1</sup> )	8000	8000
	Feed per Tooth <b>fz</b> (mm/t.)	0.2	0.13
	Table Feed <b>vf</b> (mm/min)	28800	15000
	Depth of Cut <b>ap</b> (mm)	1.5	2.5
	Width of Cut <b>ae</b> (mm)	50	20
Cutting Mode		Wet Cutting	Wet Cutting
Machine		Horizontal MC	Horizontal MC
Results		Increased efficiency with a table feed increased by 2.6 times, FMAX achieved good surface finishes and increased machining stability.	Increased efficiency with a table feed increased by 2.2 times, FMAX achieved good surface finishes and increased machining stability.

Cutter Body		FMAX-050A08R	FMAXR08014C
Insert (Grade)		GOER1401ZXFR2 (MD220)	GOER1408PXFR2-8 (MD220)
Workpiece		ADC12 	ADC12 
Cutting Conditions	Cutting Speed <b>vc</b> (m/min)	1099	2500
	Revolution <b>n</b> (min <sup>-1</sup> )	7000	9950
	Feed per Tooth <b>fz</b> (mm/t.)	0.06	0.1
	Table Feed <b>vf</b> (mm/min)	3500	14000
	Depth of Cut <b>ap</b> (mm)	0.3	1.0, Gate 7.0
	Width of Cut <b>ae</b> (mm)	20 – 30	25 – 50
Cutting Mode		Wet Cutting	Wet Cutting (Water-soluble)
Machine		Vertical MC (BT30)	Horizontal MC
Results		<p>Tool Life (m)</p> <p>5000 15000 25000</p> <p><b>FMAX</b>  <b>Can Continue</b></p> <p>Conventional </p> <p>Burr prevention inserts can ensure smooth finished surfaces and can maintain their effective burr prevention capabilities over long periods of use. As a result, they can achieve tool life which is over triple longer than conventional products.</p>	<p>Table Feed <b>vf</b> (mm/min)</p> <p>5000 10000 15000</p> <p><b>FMAX</b> </p> <p>Conventional </p> <p>FMAX achieved 1.4 times higher efficiency than a conventional product due to its fine pitch design.</p>

The above are customer's application examples, so can differ from the recommended conditions.

# Memo

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## Re-grinding of a PCD Insert

The maximum material to be re-ground is 0.6 mm.

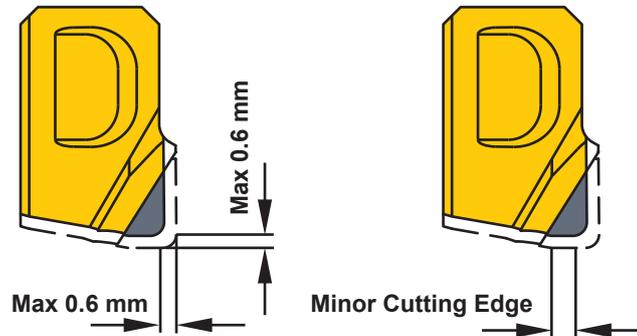
Use similar inserts after re-ground to maintain balance.

Problems may occur if the cutter isn't balanced correctly.

After re-grinding the minor edge will reduce in size and may affect surface finishes.

Check the diameter offset after fitting re-ground inserts.

\* Please contact us regarding optimum re-grinding conditions.



## Environmentally Friendly Product

This product has been certified as an environmentally friendly product in the machine tool industry by the Japan Cutting & Wear-resistant Tool Association. This is a product unique to the industry, in harmony with the environment, and with the aim of fulfilling the social responsibilities of the machine tool industry.

The Japan Cutting & Wear-resistant Tool Association evaluates the product's environmental impact during the manufacturing and usage stages and issues a certification according to the evaluation score.



**FMAX**



**FMAX-LW**

## FMAX

DC≥80 mm, general purpose insert

## FMAX-LW

for compact and smaller machining centres

## For People, Society and the Earth

More information about MITSUBISHI MATERIALS' efforts to address social and environmental issues can be found in the website below or by scanning the QR code.

<https://mmc.disclosure.site/en/>



### For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When attaching inserts or spare parts, please use only the correct wrench or driver. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

## MITSUBISHI MATERIALS CORPORATION

### MITSUBISHI MATERIALS CORPORATION

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(Tools specifications subject to change without notice.)