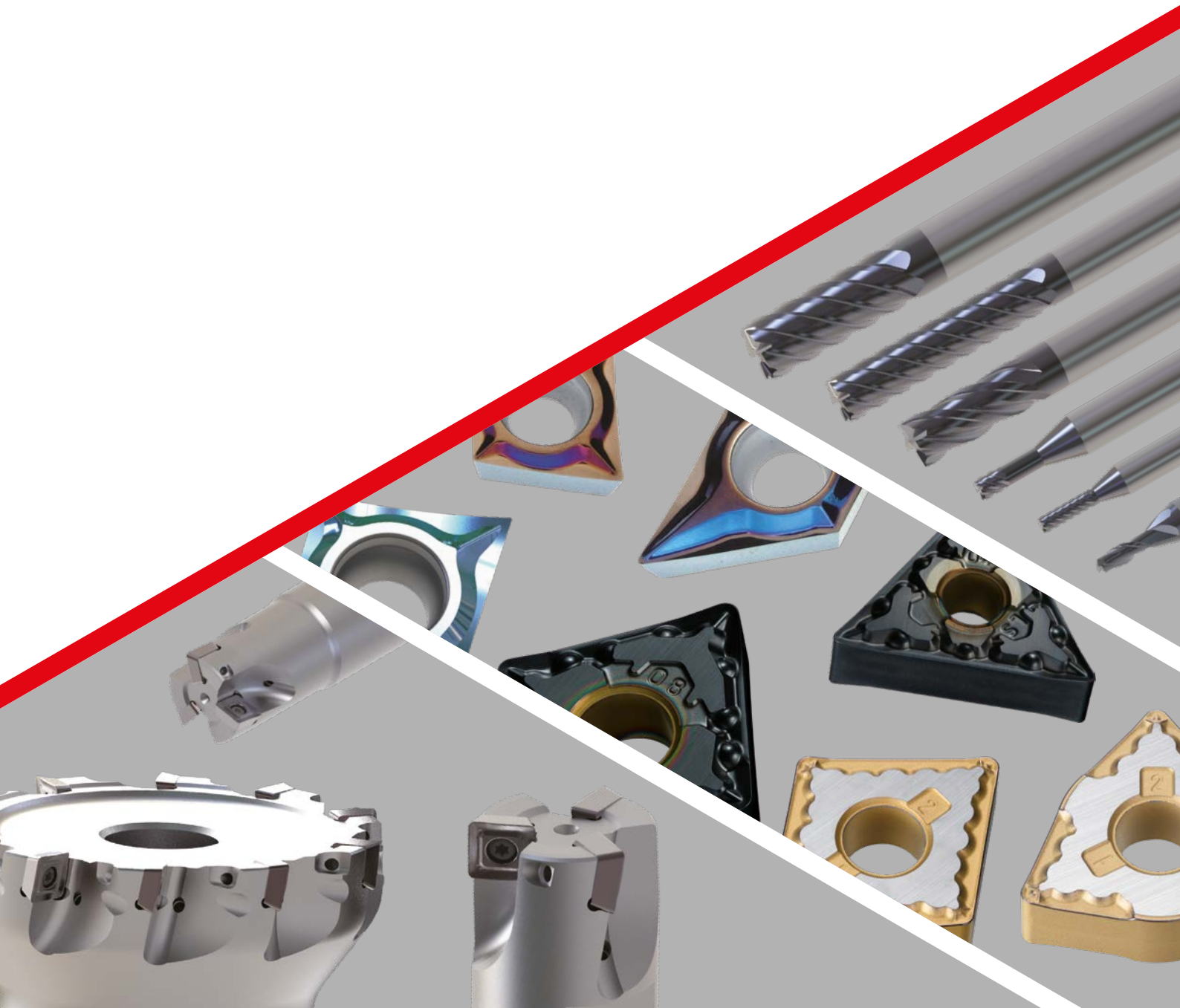
MITSUBISHI MATERIALS

PRODUCT NEWS 2026-1



NEW

PRODUCT NEWS 2026-1

CURRENT, INNOVATIVE, COMPETITIVE

NEW PRODUCTS AND SERIES EXPANSIONS AT A GLANCE

Mitsubishi Materials is consistently focusing on specific customer needs to better meet the challenges of the modern metal working industry. This catalogue shows all the new products and series expansions for turning, milling and drilling applications.

NOTES: This Product News 2026-1 (N039) complements the General Catalogue C010, and the Product News 2025 (N038).
It contains all new products and series expansions that have been launched after the release of the N038 book and the C010 catalogue.

We reserve the right to make changes to any item compared to the information and illustrations shown in this catalogue, e.g. with regard to technical data, construction, equipment provided, material and external appearance. All dimensions are in millimetres.

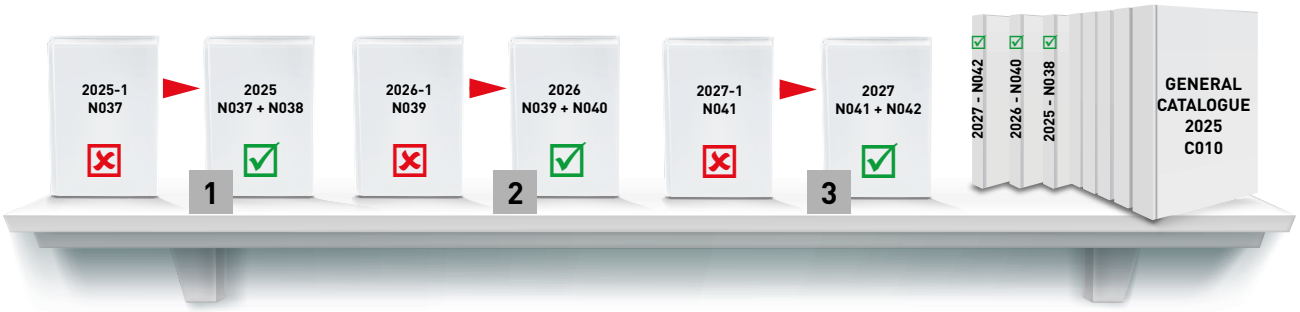
You will find the latest version of this catalogue on our website: www.mmc-carbide.com

EU

UK

CATALOGUE SYSTEM

HOW TO REPLACE PRODUCT NEWS BOOKS



NOTES:

1 The Product News 2025-1 – N037 will be integrated into Product News 2025 – N038.

2 The Product News 2026-1 – N039 will be integrated into Product News 2026 – N040.

3 The Product News 2027-1 – N041 will be integrated into Product News 2027 – N042.

☑ **The yearly Product News catalogues N038, N040 and N042 will complement the existing GENERAL CATALOGUE.**

☒ The Product News book ending with -1, can be disposed of after the publishing of the yearly Product News book.

TRANSITION FROM THE EXISTING TO THE NEW GENERAL CATALOGUE

NOTES:

☑ **The yearly Product News catalogues N038, N040 and N042 will merge into the new GENERAL CATALOGUE.**

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TURNING TOOLS

SOLID MILLING TOOLS

INDEXABLE MILLING TOOLS

NEW

LC2005

NEW DLC COATED GRADE WITH THIN-FILM TECHNOLOGY FOR PRECISION MACHINING OF NON-FERROUS METALS. DISPLAYS OUTSTANDING ADHESION AND WEAR RESISTANCE PROPERTIES.

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B290

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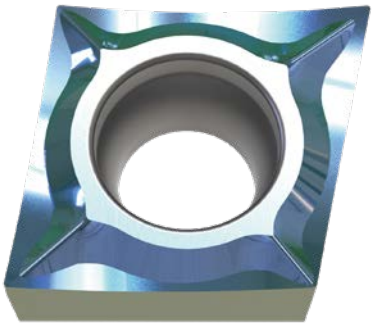
MITSUBISHI MATERIALS

LC2005

EVOLVED HYDROGEN-FREE DLC COATING

DLC coating is a film that possesses both the hardness of diamond and the lubricity of graphite. It is particularly suitable for aluminium alloy machining due to its excellent wear resistance and anti-adhesion properties, making it ideally suited for use in metal cutting applications. Hydrogen-free DLC films have high hardness and provide superior wear and heat resistance, which is why they have been widely used for coating cutting tools.
Generally, while hydrogen-free DLC excels in wear and heat resistance, it faces the challenge of being prone to peeling due to the significant hardness difference from the substrate. Mitsubishi Materials has overcome this challenge by adopting a newly developed thin hydrogen-free DLC film with improved adhesion, thereby achieving an excellent balance of wear resistance and strong adhesion to the substrate.



THREE KEY FEATURES OF HYDROGEN-FREE DLC COATING

Thin coating effective for precision machining

Ideal for machining high-precision components, delivering excellent component surface finishes.

High hardness with excellent wear resistance

Its high hardness provides superior wear resistance, resulting in extended tool life.

Outstanding adhesion

Achieves superior adhesion, suppressing sudden dimensional discrepancies caused by film peeling or chipping.

AN ENVIRONMENTALLY FRIENDLY PRODUCT BECAUSE OF EFFICIENCY IMPROVEMENTS DUE TO THE INCREASED PERFORMANCE AND LONGER TOOL LIFE.

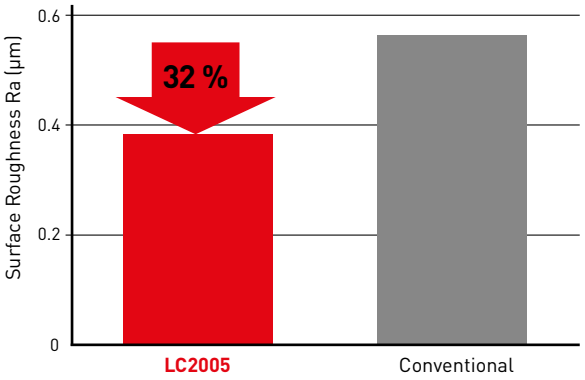
LC2005

DLC COATED GRADE FOR TURNING OF NON-FERROUS METALS

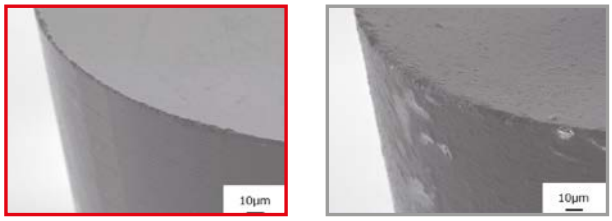
COMPARISON OF THE COMPONENT SURFACE FINISH WHEN MACHINING A6061

The sharpness of the cemented carbide substrate cutting edge and the smoothness of the thin-film make it possible to achieve high-quality machining.

Material	JIS A6061
Insert	DCGT11T302M-FS-P LC2005
Vc (m/min)	300
f (mm/rev)	0.05
ap (mm)	0.2
Cutting mode	Dry and wet cutting



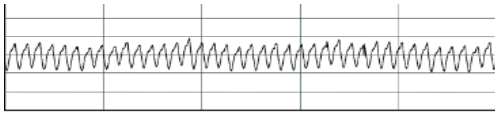
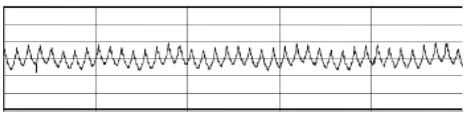
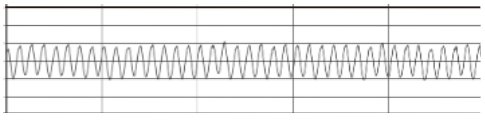
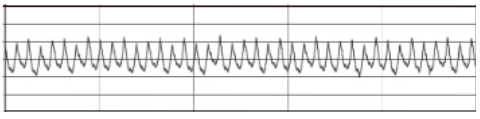
EXTREMELY HIGH QUALITY CUTTING EDGE



LC2005 | Conventional

SURFACE ROUGHNESS

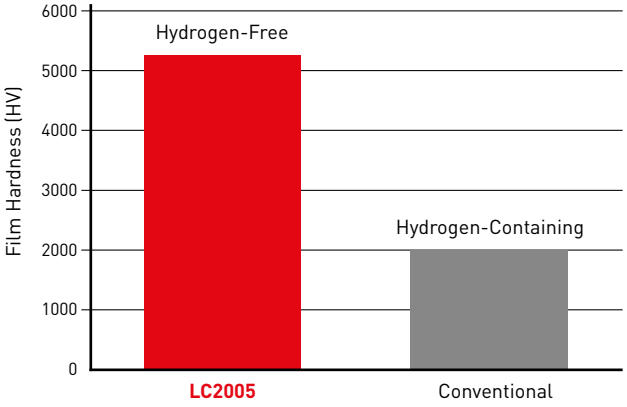
	Ra (µm)	Rz (µm)
LC2005	0.383	1.758
Conventional	0.563	2.031

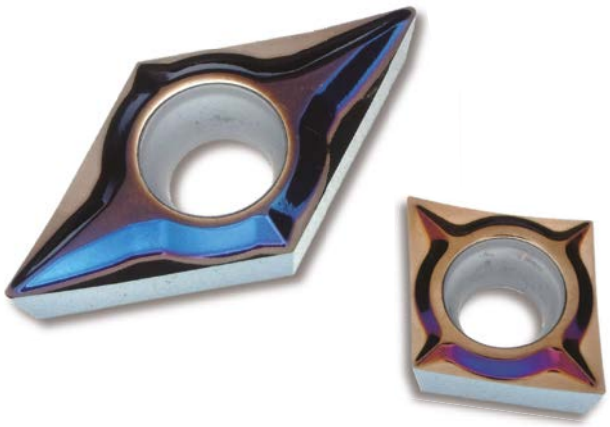
	Measured after 226 minutes of wet cutting	Measured after 27 minutes of dry cutting
LC2005	 Ra = 0.383 µm Rz = 1.758 µm	 Ra = 0.286 µm Rz = 1.630 µm
Conventional	 Ra = 0.563 µm Rz = 2.031 µm	 Ra = 0.438 µm Rz = 2.245 µm

LC2005

A HYDROGEN-FREE DLC COATING WITH EXCELLENT WEAR AND HEAT RESISTANCE

The thin-film enhances adhesion, achieving excellent tool life in both wet and dry cutting.



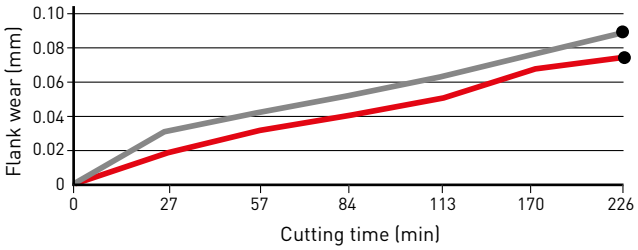


The colours of DLC coatings can vary in appearance depending on the thickness of the film. However, this is only visual and has no effect on quality or performance.

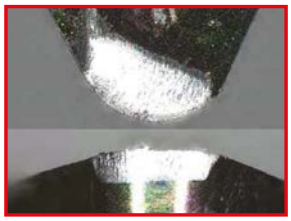
WEAR RESISTANCE COMPARISON WHEN MACHINING A6061

Mitsubishi Materials' hydrogen-free coating has excellent peeling resistance and demonstrates the inherent high performance of the coating.

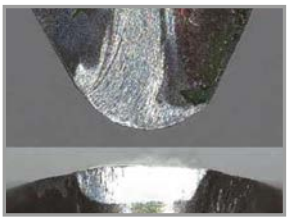
Material	JIS A6061
Insert	DCGT11T302M-FS-P LC2005
Vc (m/min)	300
f (mm/rev)	0.05
ap (mm)	0.2
Cutting mode	Wet cutting



● Taken after cutting length of 226 min



LC2005
FS-P



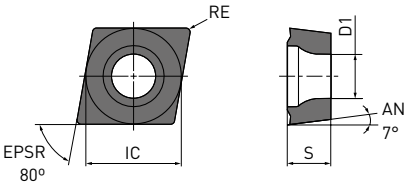
Conventional
Wear progresses due to peeling

CCET, CCGT, DCET, DCGT

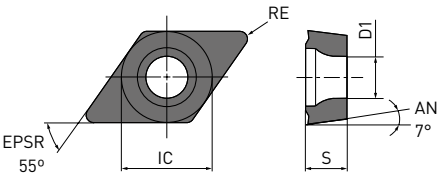
7° POSITIVE INSERTS (WITH HOLE)

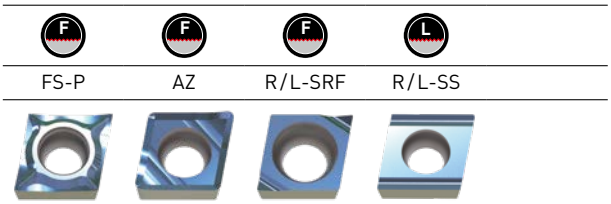
E Class, G Class

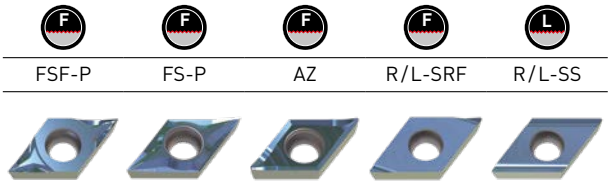
CCET, CCGT



DCET, DCGT







Order number	F	L	LC2005	IC	S	RE	D1
CCGT060201M-FS-P	F		●	6.35	2.38	≤0.1	2.8
CCGT060202M-FS-P	F		●	6.35	2.38	≤0.2	2.8
CCGT060204M-FS-P	F		●	6.35	2.38	≤0.4	2.8
CCGT09T301M-FS-P	F		●	9.53	3.97	≤0.1	4.4
CCGT09T302M-FS-P	F		●	9.53	3.97	≤0.2	4.4
CCGT09T304M-FS-P	F		●	9.53	3.97	≤0.4	4.4
CCGT09T304-AZ	F		●	9.53	3.97	0.4	4.4
CCGT09T308-AZ	F		●	9.53	3.97	0.8	4.4
CCET03S1V3R-SRF	F		●	3.97	1.39	0.03	2
CCET03S1V3L-SRF	F		●	3.97	1.39	0.03	2
CCET03S101MR-SRF	F		●	3.97	1.39	≤0.1	2
CCET03S101ML-SRF	F		●	3.97	1.39	≤0.1	2
CCET03S102MR-SRF	F		●	3.97	1.39	≤0.2	2
CCET03S102ML-SRF	F		●	3.97	1.39	≤0.2	2
CCET03S104MR-SRF	F		●	3.97	1.39	≤0.4	2
CCET03S104ML-SRF	F		●	3.97	1.39	≤0.4	2
CCET04T0V3R-SRF	F		●	4.76	1.79	0.03	2.4
CCET04T0V3L-SRF	F		●	4.76	1.79	0.03	2.4
CCET04T001MR-SRF	F		●	4.76	1.79	≤0.1	2.4
CCET04T001ML-SRF	F		●	4.76	1.79	≤0.1	2.4
CCET04T002MR-SRF	F		●	4.76	1.79	≤0.2	2.4
CCET04T002ML-SRF	F		●	4.76	1.79	≤0.2	2.4
CCET04T004MR-SRF	F		●	4.76	1.79	≤0.4	2.4

1/2

(10 inserts in one case)

● : Inventory maintained. ★ : Inventory maintained in Japan.

CCET, CCGT, DCET, DCGT – 7° POSITIVE INSERTS (WITH HOLE)

Order number	F	L	LC2005	IC	S	RE	D1
CCET04T004ML-SRF	F		●	4.76	1.79	≤0.4	2.4
CCET060201MR-SS	L		●	6.35	2.38	≤0.1	2.8
CCET060201ML-SS	L		●	6.35	2.38	≤0.1	2.8
CCET060202MR-SS	L		●	6.35	2.38	≤0.2	2.8
CCET060202ML-SS	L		●	6.35	2.38	≤0.2	2.8
CCET09T301MR-SS	L		●	9.525	3.97	≤0.1	4.4
CCET09T301ML-SS	L		●	9.525	3.97	≤0.1	4.4
CCET09T302MR-SS	L		●	9.525	3.97	≤0.2	4.4
CCET09T302ML-SS	L		●	9.525	3.97	≤0.2	4.4
CCET09T304MR-SS	L		●	9.525	3.97	≤0.4	4.4
CCET09T304ML-SS	L		●	9.525	3.97	≤0.4	4.4
DCGT070201M-FSF-P	F		●	6.35	2.38	≤0.1	2.8
DCGT070202M-FSF-P	F		●	6.35	2.38	≤0.2	2.8
DCGT11T301M-FSF-P	F		●	9.525	3.97	≤0.1	4.4
DCGT11T302M-FSF-P	F		●	9.525	3.97	≤0.2	4.4
DCGT070201M-FS-P	F		●	6.35	2.38	≤0.1	2.8
DCGT070202M-FS-P	F		●	6.35	2.38	≤0.2	2.8
DCGT070204M-FS-P	F		●	6.35	2.38	≤0.4	2.8
DCGT11T301M-FS-P	F		●	9.525	3.97	≤0.1	4.4
DCGT11T302M-FS-P	F		●	9.525	3.97	≤0.2	4.4
DCGT11T304M-FS-P	F		●	9.525	3.97	≤0.4	4.4
DCGT11T304-AZ	F		●	9.525	3.97	0.4	4.4
DCGT11T308-AZ	F		●	9.525	3.97	0.8	4.4
DCET070201MR-SRF	F		●	6.35	2.38	≤0.1	2.8
DCET070201ML-SRF	F		●	6.35	2.38	≤0.1	2.8
DCET070202MR-SRF	F		●	6.35	2.38	≤0.2	2.8
DCET070202ML-SRF	F		●	6.35	2.38	≤0.2	2.8
DCET070204MR-SRF	F		●	6.35	2.38	≤0.4	2.8
DCET070204ML-SRF	F		●	6.35	2.38	≤0.4	2.8
DCET11T301MR-SRF	F		●	9.525	3.97	≤0.1	4.4
DCET11T301ML-SRF	F		●	9.525	3.97	≤0.1	4.4
DCET11T302MR-SRF	F		●	9.525	3.97	≤0.2	4.4
DCET11T302ML-SRF	F		●	9.525	3.97	≤0.2	4.4
DCET11T304MR-SRF	F		●	9.525	3.97	≤0.4	4.4
DCET11T304ML-SRF	F		●	9.525	3.97	≤0.4	4.4
DCET0702V3R-SS	L		●	6.35	2.38	0.03	2.8
DCET0702V3L-SS	L		●	6.35	2.38	0.03	2.8
DCET070201MR-SS	L		●	6.35	2.38	≤0.1	2.8
DCET070201ML-SS	L		●	6.35	2.38	≤0.1	2.8
DCET070202MR-SS	L		●	6.35	2.38	≤0.2	2.8
DCET070202ML-SS	L		●	6.35	2.38	≤0.2	2.8
DCET11T301MR-SS	L		●	9.525	3.97	≤0.1	4.4
DCET11T301ML-SS	L		●	9.525	3.97	≤0.1	4.4
DCET11T302MR-SS	L		●	9.525	3.97	≤0.2	4.4
DCET11T302ML-SS	L		●	9.525	3.97	≤0.2	4.4
DCET11T304MR-SS	L		●	9.525	3.97	≤0.4	4.4
DCET11T304ML-SS	L		●	9.525	3.97	v0.4	4.4

(10 inserts in one case)

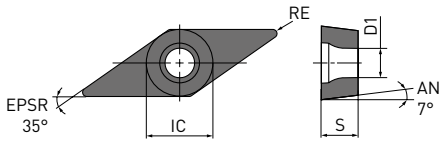
● : Inventory maintained. ★ : Inventory maintained in Japan.

VCGT, VPGT

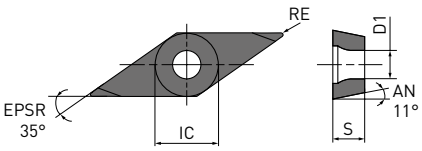
7°, 11° POSITIVE INSERTS (WITH HOLE)

G Class

VCGT



VPGT



AZ

FSF-P

Order number	F	L	LC2005	IC	S	RE	D1
VCGT160404-AZ	F		●	9.525	4.76	0.4	4.4
VPGT110301M-FSF-P	F		●	6.35	3.18	≤0.1	2.85
VPGT110302M-FSF-P	F		●	6.35	3.18	≤0.2	2.85

1/1

(10 inserts in one case)

11 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

LC2005

RECOMMENDED CUTTING CONDITIONS

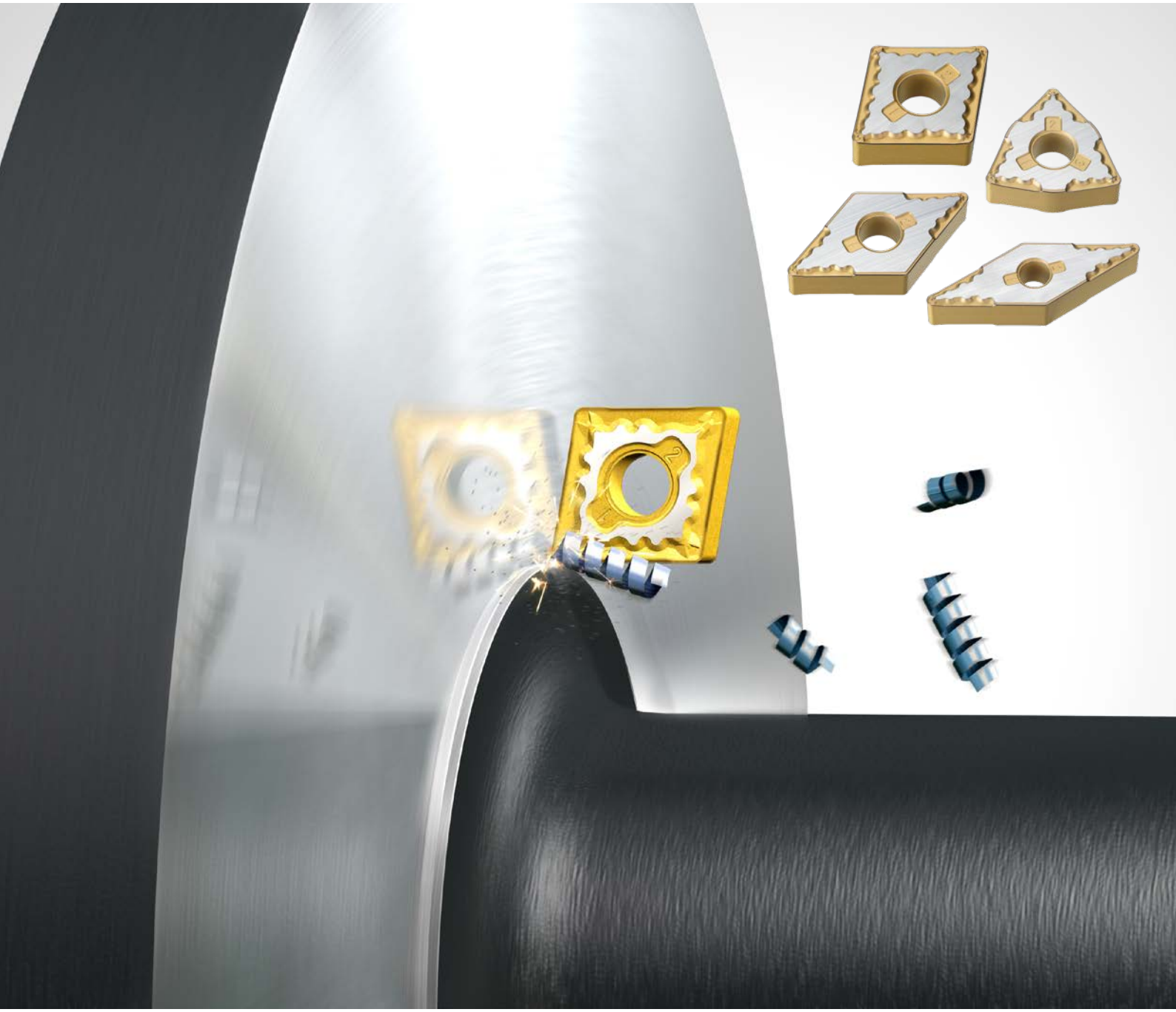
	Material	Properties	Cutting conditions	F L		Grade	Vc	f	ap
N	Aluminium alloys (A6061, A7075, etc.)	Si<5 %	●	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
			◐	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
			✣	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
	Aluminium alloys (AC4B, etc.)	5≤Si≤10 %	●	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
			◐	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
			✣	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
	Aluminium alloys (ADC12, A390, etc.)	Si>10 %	●	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
			◐	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0
			✣	F	FS-P	LC2005	200 – 700	0.04 – 0.12	0.20 – 1.4
				F	FSF-P	LC2005	200 – 700	0.02 – 0.10	0.02 – 1.0
				F	R/L-SRF	LC2005	200 – 700	0.02 – 0.12	0.20 – 0.6
				F	AZ	LC2005	200 – 700	0.10 – 0.40	0.20 – 3.0
				L	R/L-SS	LC2005	200 – 700	0.01 – 0.09	0.10 – 5.0

1/1

Cutting conditions: ●: Stable cutting ◐: General cutting ✣: Unstable cutting
Cutting area: F: Finish cutting L: Light cutting

MC6100 SERIES

BRINGING THE ULTIMATE HIGH SPEED CUTTING PERFORMANCE



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MITSUBISHI MATERIALS

MC6100 SERIES

CVD COATED GRADE FOR STEEL TURNING

Dramatic increase in stability and wear resistance is enabled by utilising the improved coating adhesion and crystal orientation technology.

MC6115

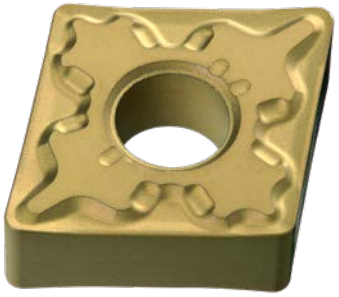
For high speed turning

MC6125

First recommendation for a wide range of applications

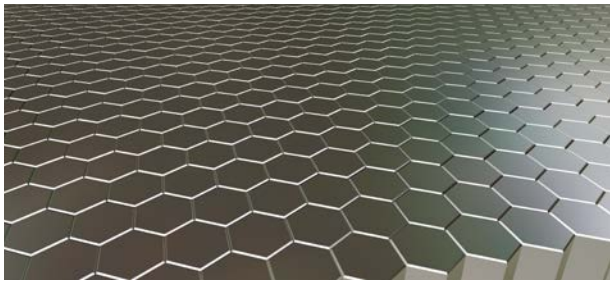
MC6135

For excellent fracture resistance

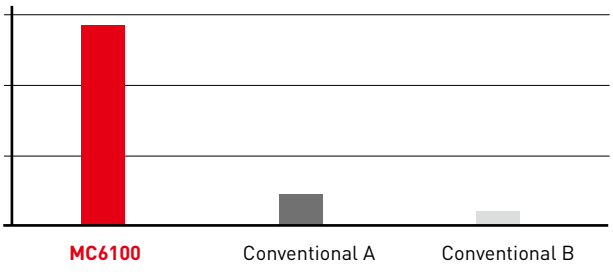


"SUPER" NANO TEXTURE TECHNOLOGY

The standard Nano Texture Technology has been improved and developed to be an industry leading standard for crystal growth of Al_2O_3 coatings. This Super Nano Texture Technology increases tool life and wear resistance due to the process that creates fine, dense crystal growth.



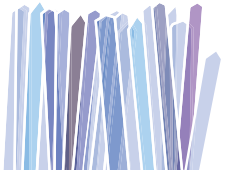
CRYSTAL ORIENTATION
(Image)



The ratio of Al_2O_3 crystal grains with the same orientation

Conventional CVD inserts

Grain size and growth direction are uneven.



Nano Texture

Uniformity of the grain size and growth direction has improved.

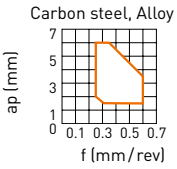
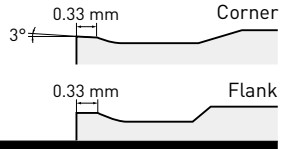
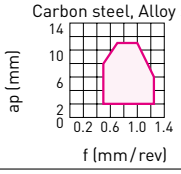
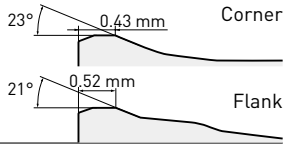
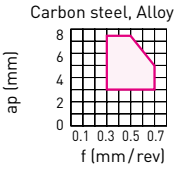
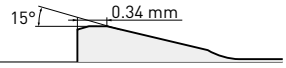
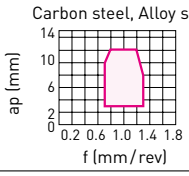
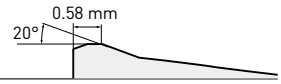
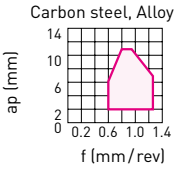
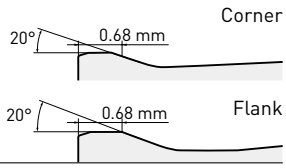
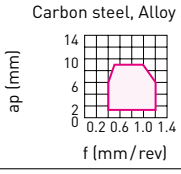
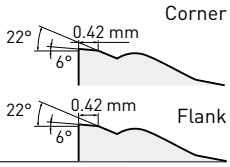
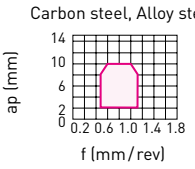
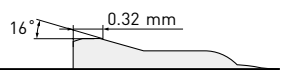
„Super" Nano Texture

Uniformity of the growth direction has drastically improved.

MC6100 SERIES

CHIPBREAKER SYSTEM FOR STEEL TURNING

NEGATIVE INSERTS

Tolerance		Features		Cross section geometry
ROUGH CUTTING				
M	 RP	**FIRST RECOMMENDATION FOR ROUGH CUTTING OF CARBON STEEL AND ALLOY STEEL** For interrupted cutting and removing scale. Good balance of cutting edge strength and low cutting resistance because of a suitable rake angle.		
HEAVY CUTTING				
M	 HX	**FIRST RECOMMENDATION FOR HEAVY CUTTING OF CARBON STEEL AND ALLOY STEEL** Covers the medium range of the heavy cutting region. Owing to the straight edge and chamfer, it gives a balance of sharpness and strength. Variable land and a wavy chipbreaker for good chip control.		
M	 HL	**FIRST RECOMMENDATION FOR HEAVY CUTTING ALTERNATIVE CHIPBREAKER FOR HEAVY CUTTING OF CARBON STEEL AND ALLOY STEEL** Low resistance due to narrow flat land. Achieves high chip breaking ability.		
M	 HR	**ALTERNATIVE CHIPBREAKER FOR HEAVY CUTTING OF CARBON STEEL AND ALLOY STEEL** High cutting edge strength. Excellent chip discharge even with high feed and high depth of cut.		
M	 HV	**ALTERNATIVE CHIPBREAKER FOR HEAVY CUTTING OF CARBON STEEL AND ALLOY STEEL** Covers the upper end of the heavy cutting region. Wide land and large chamfer offer high edge strength. A wide chipbreaker prevents chip jamming.		
M	 HZ	**ALTERNATIVE CHIPBREAKER FOR HEAVY CUTTING OF CARBON AND ALLOY STEEL** Covers the lower end of the heavy cutting area. Low cutting resistance due to positive land and curved edge. Teardrop dots improve chip control without increasing cutting resistance.		
M	 HM	**ALTERNATIVE CHIPBREAKER FOR HEAVY CUTTING OF CARBON, ALLOY AND STAINLESS STEELS** Flat land provides outstanding balance between cutting edge strength and sharpness.		

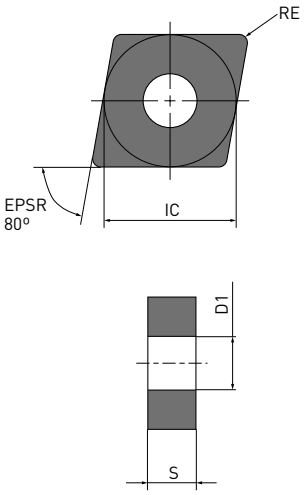
1/1

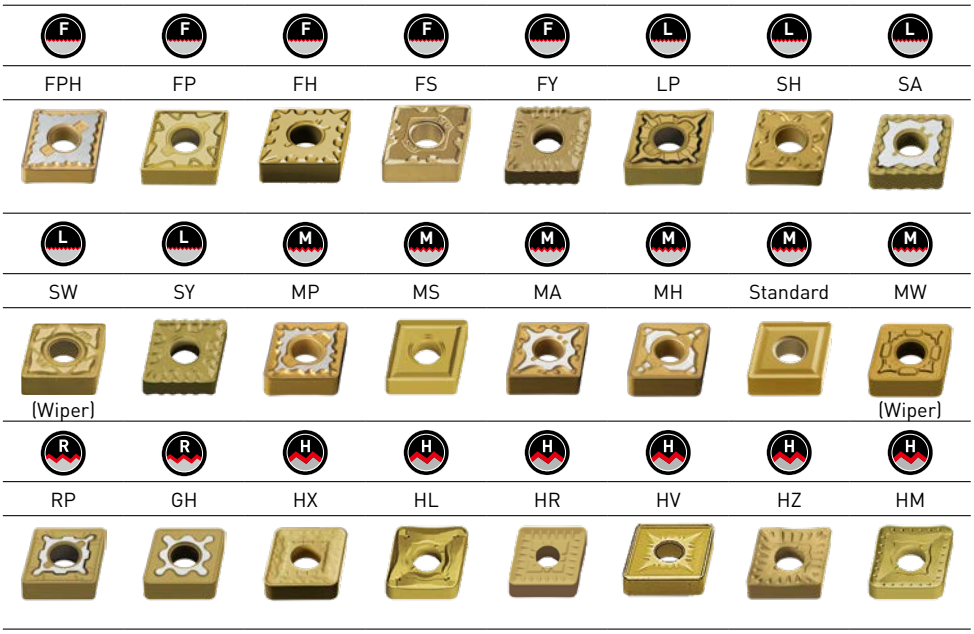
CNMM

NEGATIVE INSERTS (WITH HOLE)

M Class

CNMM





Order number	F L M R H	MC6115	MC6125	MC6135	IC	S	RE	D1
NEW CNMM190624-RP*1	R	●	●		19.05	6.35	2.4	7.93
CNMM190612-HL	H	●	●	●	19.05	6.35	1.2	7.93
CNMM190616-HL	H	●	●	★	19.05	6.35	1.6	7.93
CNMM190624-HL	H	●	★	★	19.05	6.35	2.4	7.93
CNMM190612-HM	H	●	●	●	19.05	6.35	1.2	7.93
CNMM190616-HM	H	●	●	★	19.05	6.35	1.6	7.93
CNMM190624-HM	H	●	★	★	19.05	6.35	2.4	7.93

1/1

(10 inserts in one case)

*1 The RP type is a single-sided chipbreaker.

17 Vc

● / ★ = Expansion

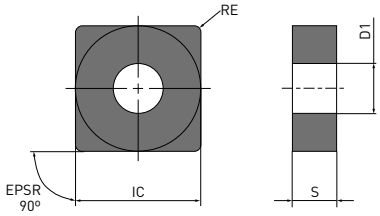
● : Inventory maintained. ★ : Inventory maintained in Japan.

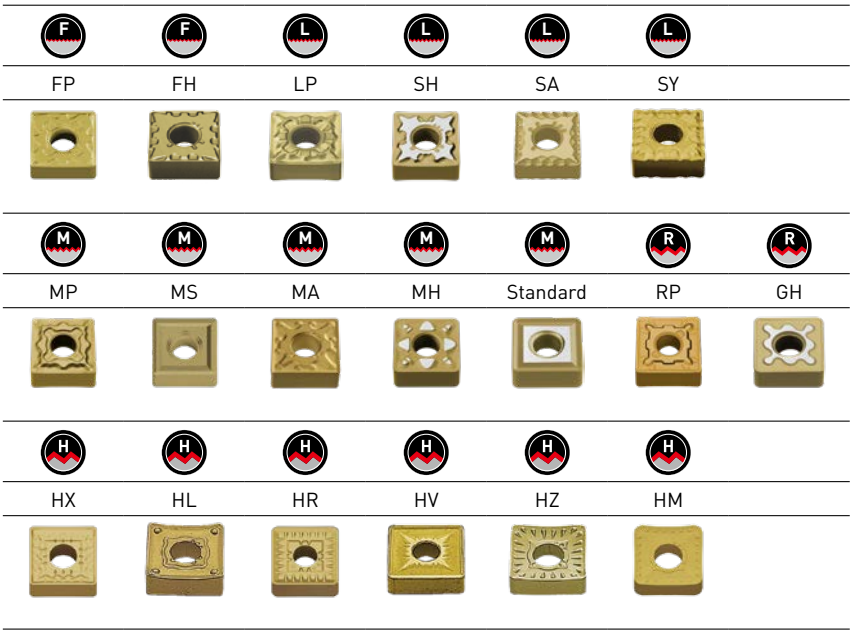
SNMM

NEGATIVE INSERTS (WITH HOLE)

M Class

SNMM





	Order number	F L M R H	MC6115	MC6125	MC6135	IC	S	RE	D1
NEW	SNMM190624-RP*1	R	●	●		19.05	6.35	2.4	7.93
NEW	SNMM250732-HX	H		●		25.4	7.94	3.2	9.12
	SNMM190612-HL	H	●	●	★	19.05	6.35	1.2	7.93
	SNMM190616-HL	H	●	●	★	19.05	6.35	1.6	7.93
	SNMM190624-HL	H	●	★	★	19.05	6.35	2.4	7.93
NEW	SNMM250732-HR	H		●		25.4	7.94	3.2	9.12
	SNMM190612-HM	H	●	★	★	19.05	6.35	1.2	7.93
	SNMM190616-HM	H	●	●	★	19.05	6.35	1.6	7.93
	SNMM190624-HM	H	●	★	●	19.05	6.35	2.4	7.93
NEW	SNMM250732-HM	H		●		25.4	7.94	3.2	9.12

(10 inserts in one case)

*1 TheRP type is a single-sided chipbreaker.

17 Vc

● / ★ = Expansion

● : Inventory maintained. ★ : Inventory maintained in Japan.

MC6100 SERIES

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERTS (FOR EXTERNAL TURNING)

	Material	Properties	Conditions	F L M R H	Priority	Grade		Vc	f	ap
P	Mild steel	≤180 HB	✣	F	1	MC6125	FY	385 – 605	0.09 – 0.23	0.20 – 0.80
			✣	F	2	MC6135	FY	315 – 480	0.09 – 0.23	0.20 – 0.80
			✣	L	1	MC6125	SY	350 – 550	0.16 – 0.33	0.50 – 1.20
			✣	L	2	MC6135	SY	290 – 435	0.16 – 0.33	0.50 – 1.20
	Carbon and alloy steel	180 – 280 HB	●	F	1	MC6115	FPH	275 – 525	0.20 – 0.50	0.10 – 1.00
			●	F	1	MC6115	FP	250 – 480	0.08 – 0.25	0.10 – 1.00
			●	F	2	MC6125	FP	275 – 425	0.08 – 0.25	0.10 – 1.00
			●	L	1	MC6115	LP	250 – 480	0.10 – 0.40	0.30 – 2.00
			●	L	2	MC6125	LP	275 – 425	0.10 – 0.40	0.30 – 2.00
			●	L	3	MC6115	SH	250 – 480	0.10 – 0.40	0.30 – 2.00
			●	L	4	MC6125	SH	275 – 425	0.10 – 0.40	0.30 – 2.00
			●	L	5	MC6115	SA	250 – 480	0.10 – 0.40	0.30 – 2.00
			●	L	6	MC6125	SA	275 – 425	0.10 – 0.40	0.30 – 2.00
			●	L	7	MC6115	SW	250 – 480	0.10 – 0.50	0.30 – 2.50
			●	L	8	MC6125	SW	275 – 425	0.10 – 0.50	0.30 – 2.50
			●	M	1	MC6115	MP	230 – 440	0.16 – 0.50	0.30 – 4.00
			●	M	2	MC6125	MP	250 – 390	0.16 – 0.50	0.30 – 4.00
			●	M	3	MC6115	MA	230 – 440	0.20 – 0.50	0.30 – 4.00
			●	M	4	MC6125	MA	250 – 390	0.20 – 0.50	0.30 – 4.00
			●	M	5	MC6115	Std	230 – 440	0.25 – 0.60	1.50 – 5.00
			●	M	6	MC6125	Std	250 – 390	0.25 – 0.60	1.50 – 5.00
			●	M	7	MC6115	MW	230 – 440	0.20 – 0.60	0.90 – 4.00
			●	M	8	MC6125	MW	250 – 390	0.20 – 0.60	0.90 – 4.00
			●	R	1	MC6115	RP	215 – 415	0.25 – 0.60	1.50 – 6.00
			●	R	2	MC6125	RP	235 – 370	0.25 – 0.60	1.50 – 6.00
			●	R	3	MC6115	GH	215 – 415	0.25 – 0.60	1.50 – 6.00
			●	R	4	MC6125	GH	235 – 370	0.25 – 0.60	1.50 – 6.00
			●	H	1	MC6125	HX	210 – 330	0.50 – 1.26	3.00 – 11.00
			●	H	2	MC6135	HX	170 – 260	0.50 – 1.26	3.00 – 11.00
			●	H	3	MC6125	HV	175 – 270	0.58 – 1.26	4.00 – 12.00
			●	H	4	MC6135	HV	140 – 215	0.58 – 1.26	4.00 – 12.00

1/3

1. Recommended cutting conditions for 5°/7°/11° positive inserts are provided as a guideline only.
   Verify the recommended conditions for each boring bar as cutting conditions for internal machining will vary depending on the length of overhang.

Cutting conditions: ●: Stable cutting ◔: General cutting ✣: Unstable cutting

MC6100 SERIES – NEGATIVE INSERTS (FOR EXTERNAL TURNING)

	Material	Properties	Conditions	F L M R H	Priority	Grade		Vc	f	ap
P	Carbon and alloy steel	180 – 280 HB	◐	F	1	MC6125	FPH	300 – 465	0.20 – 0.50	0.10 – 1.00
			◐	F	1	MC6115	FP	250 – 480	0.08 – 0.25	0.10 – 1.00
			◐	F	2	MC6125	FP	275 – 425	0.08 – 0.25	0.10 – 1.00
			◐	L	1	MC6115	LP	250 – 480	0.10 – 0.40	0.30 – 2.00
			◐	L	2	MC6125	LP	275 – 425	0.10 – 0.40	0.30 – 2.00
			◐	L	3	MC6115	SH	250 – 480	0.10 – 0.40	0.30 – 2.00
			◐	L	4	MC6125	SH	275 – 425	0.10 – 0.40	0.30 – 2.00
			◐	L	5	MC6115	SA	250 – 480	0.10 – 0.40	0.30 – 2.00
			◐	L	6	MC6125	SA	275 – 425	0.10 – 0.40	0.30 – 2.00
			◐	L	7	MC6115	SW	250 – 480	0.10 – 0.50	0.30 – 2.50
			◐	L	8	MC6125	SW	275 – 425	0.10 – 0.50	0.30 – 2.50
			◐	M	1	MC6125	MP	250 – 390	0.16 – 0.50	0.30 – 4.00
			◐	M	2	MC6135	MP	205 – 310	0.16 – 0.50	0.30 – 4.00
			◐	M	3	MC6125	MA	250 – 390	0.20 – 0.50	0.30 – 4.00
			◐	M	4	MC6135	MA	205 – 310	0.20 – 0.50	0.30 – 4.00
			◐	M	5	MC6125	MH	250 – 390	0.20 – 0.55	1.00 – 4.00
			◐	M	6	MC6135	MH	205 – 310	0.20 – 0.55	1.00 – 4.00
			◐	M	7	MC6125	Std	250 – 390	0.25 – 0.60	1.50 – 5.00
			◐	M	8	MC6135	Std	205 – 310	0.25 – 0.60	1.50 – 5.00
			◐	M	9	MC6125	MW	250 – 390	0.20 – 0.60	0.90 – 4.00
			◐	M	10	MC6135	MW	205 – 310	0.20 – 0.60	0.90 – 4.00
			◐	R	1	MC6135	RP	190 – 290	0.25 – 0.60	1.50 – 6.00
			◐	R	2	MC6125	RP	235 – 370	0.25 – 0.60	1.50 – 6.00
			◐	R	3	MC6135	GH	190 – 290	0.25 – 0.60	1.50 – 6.00
			◐	R	4	MC6125	GH	235 – 370	0.25 – 0.60	1.50 – 6.00
			◐	H	1	MC6135	HX	170 – 260	0.50 – 1.26	3.00 – 11.00
			◐	H	2	MC6125	HX	210 – 330	0.50 – 1.26	3.00 – 11.00
			◐	H	3	MC6135	HV	140 – 215	0.58 – 1.26	4.00 – 12.00
			◐	H	4	MC6125	HV	175 – 270	0.58 – 1.26	4.00 – 12.00

2/3

1. Recommended cutting conditions for 5°/7°/11° positive inserts are provided as a guideline only.
   Verify the recommended conditions for each boring bar as cutting conditions for internal machining will vary depending on the length of overhang.

Cutting conditions: ●: Stable cutting ◐: General cutting ✱: Unstable cutting

MC6100 SERIES – NEGATIVE INSERTS (FOR EXTERNAL TURNING)

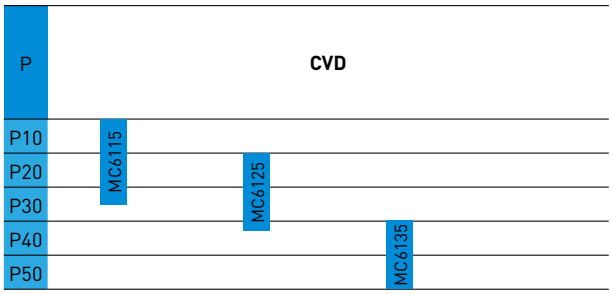
	Material	Properties	Conditions	F L M R H	Priority	Grade		Vc	f	ap
P	Carbon and alloy steel	180 – 280 HB		F	1	MC6135	FP	245 – 370	0.08 – 0.25	0.10 – 1.00
				F	2	MC6125	FP	300 – 465	0.08 – 0.25	0.10 – 1.00
				F	3	MC6135	FPH	245 – 370	0.20 – 0.50	0.10 – 1.00
				L	1	MC6135	LP	225 – 340	0.10 – 0.40	0.30 – 2.00
				L	2	MC6125	LP	275 – 425	0.10 – 0.40	0.30 – 2.00
				L	3	MC6135	SH	225 – 340	0.10 – 0.40	0.30 – 2.00
				L	4	MC6125	SH	275 – 425	0.10 – 0.40	0.30 – 2.00
				L	5	MC6135	SA	225 – 340	0.10 – 0.40	0.30 – 2.00
				L	6	MC6125	SA	275 – 425	0.10 – 0.40	0.30 – 2.00
				M	1	MC6135	MP	205 – 310	0.16 – 0.50	0.30 – 4.00
				M	2	MC6125	MP	250 – 390	0.16 – 0.50	0.30 – 4.00
				M	3	MC6135	MA	205 – 310	0.20 – 0.50	0.30 – 4.00
				M	4	MC6125	MA	250 – 390	0.20 – 0.50	0.30 – 4.00
				M	5	MC6135	MH	205 – 310	0.20 – 0.55	1.00 – 4.00
				M	6	MC6125	MH	250 – 390	0.20 – 0.55	1.00 – 4.00
				M	7	MC6135	Std	205 – 310	0.25 – 0.60	1.50 – 5.00
				M	8	MC6125	Std	250 – 390	0.25 – 0.60	1.50 – 5.00
				M	9	MC6135	MW	205 – 310	0.20 – 0.60	0.90 – 4.00
				M	10	MC6125	MW	250 – 390	0.20 – 0.60	0.90 – 4.00
				R	1	MC6135	RP	190 – 290	0.25 – 0.60	1.50 – 6.00
				R	2	MC6125	RP	235 – 370	0.25 – 0.60	1.50 – 6.00
				R	3	MC6135	GH	190 – 290	0.25 – 0.60	1.50 – 6.00
				R	4	MC6125	GH	235 – 370	0.25 – 0.60	1.50 – 6.00
				H	1	MC6135	HX	170 – 260	0.50 – 1.26	3.00 – 11.00
				H	2	MC6125	HX	210 – 330	0.50 – 1.26	3.00 – 11.00

3/3

1. Recommended cutting conditions for 5°/7°/11° positive inserts are provided as a guideline only.
   Verify the recommended conditions for each boring bar as cutting conditions for internal machining will vary depending on the length of overhang.

SELECTION CRITERIA AND APPLICATION RANGE

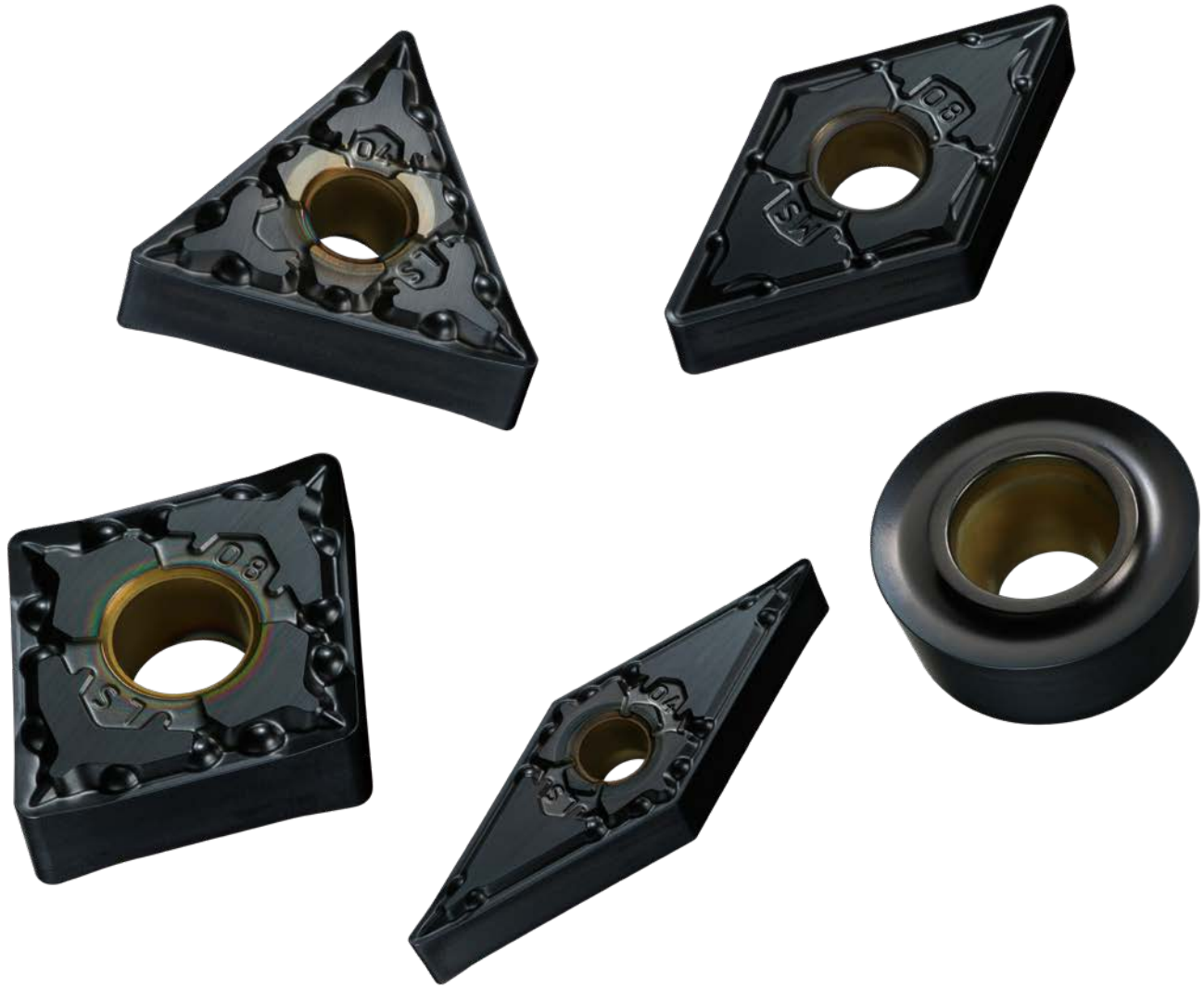
	Material	Cutting mode		Grade
P	Steels	Continuous cutting	*Low*	MC6115
			Medium	MC6125
		Interrupted cutting	*High*	MC6135



Cutting conditions: ●: Stable cutting ◐: General cutting ✲: Unstable cutting

MV9005

CVD-COATED GRADES EXCEED ALL CURRENT STANDARDS WHEN MACHINING HEAT RESISTANT SUPER ALLOYS



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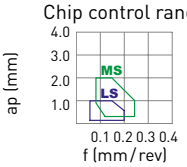
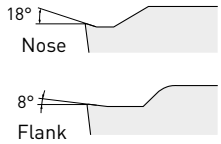
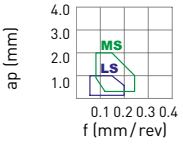
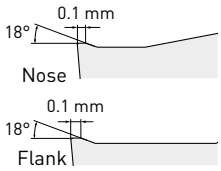
MITSUBISHI MATERIALS

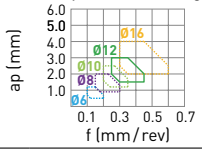
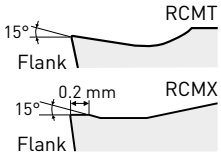
MV9005

CHIPBREAKER SYSTEM

POSITIVE INSERTS

Tolerance	Features	Cross section geometry
LIGHT CUTTING		
M	 LS Prevents insert welding and reduces the cloudiness of the finished surface.	Chip control range  
MEDIUM CUTTING		
	 MS Reduces cutting resistance, chatter, vibration and chip clogging.	Chip control range  

POSITIVE INSERTS

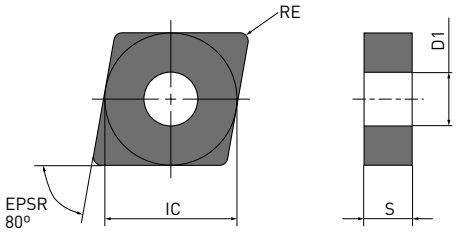
Tolerance	Features	Cross section geometry
MEDIUM CUTTING		
M	Balance of strength and sharpness due to a combination of a flat land and rake angle.	Chip Control Range  

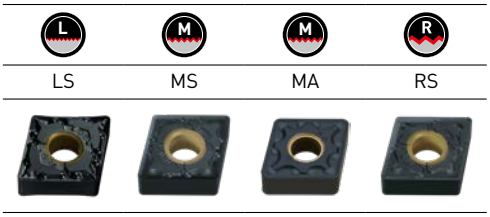
CNMG

NEGATIVE INSERTS (WITH HOLE)

M Class

CNMG





Order number	L M R	MV9005	IC	S	RE	D1
CNMG120402-LS	L	●	12.7	4.76	0.2	5.16
CNMG120404-LS	L	●	12.7	4.76	0.4	5.16
CNMG120408-LS	L	●	12.7	4.76	0.8	5.16
CNMG120404-MS	M	●	12.7	4.76	0.4	5.16
CNMG120408-MS	M	●	12.7	4.76	0.8	5.16
CNMG120412-MS	M	●	12.7	4.76	1.2	5.16
CNMG120408-MA	M	●	12.7	4.76	0.8	5.16
CNMG120412-MA	M	●	12.7	4.76	1.2	5.16
CNMG120416-MA	M	●	12.7	4.76	1.6	5.16
CNMG120408-RS	R	●	12.7	4.76	0.8	5.16
CNMG120412-RS	R	●	12.7	4.76	1.2	5.16
CNMG120416-RS	R	●	12.7	4.76	1.6	5.16
CNMG190616-RS	R	●	19.05	6.35	1.6	7.93

1/1

33 Vc

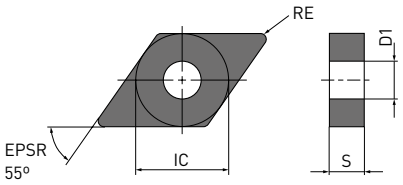
● : Inventory maintained. ★ : Inventory maintained in Japan.

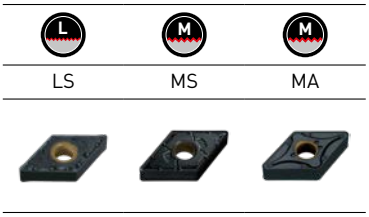
DNMG

NEGATIVE INSERTS (WITH HOLE)

M Class

DNMG





	Order number	L	M	R	MV9005	IC	S	RE	D1
	DNMG150402-LS	L			●	12.7	4.76	0.2	5.16
	DNMG150404-LS	L			●	12.7	4.76	0.4	5.16
	DNMG150408-LS	L			●	12.7	4.76	0.8	5.16
NEW	DNMG150604-LS	L			●	12.7	6.35	0.4	5.16
NEW	DNMG150608-LS	L			●	12.7	6.35	0.8	5.16
NEW	DNMG150612-LS	L			●	12.7	6.35	1.2	5.16
	DNMG150404-MS		M		●	12.7	4.76	0.4	5.16
	DNMG150408-MS		M		●	12.7	4.76	0.8	5.16
	DNMG150412-MS		M		●	12.7	4.76	1.2	5.16
NEW	DNMG150604-MS		M		●	12.7	6.35	0.4	5.16
NEW	DNMG150608-MS		M		●	12.7	6.35	0.8	5.16
NEW	DNMG150612-MS		M		●	12.7	6.35	1.2	5.16
	DNMG150404-MA		M		●	12.7	4.76	0.4	5.16
	DNMG150408-MA		M		●	12.7	4.76	0.8	5.16
	DNMG150412-MA		M		●	12.7	4.76	1.2	5.16
NEW	DNMG150604-MA		M		●	12.7	6.35	0.4	5.16
NEW	DNMG150608-MA		M		●	12.7	6.35	0.8	5.16
NEW	DNMG150612-MA		M		●	12.7	6.35	1.2	5.16

33 Vc

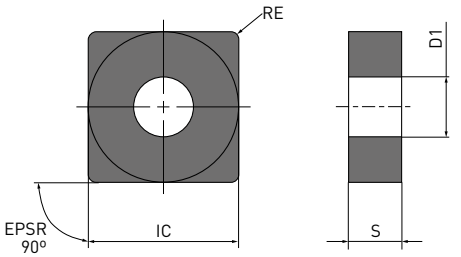
● : Inventory maintained. ★ : Inventory maintained in Japan.

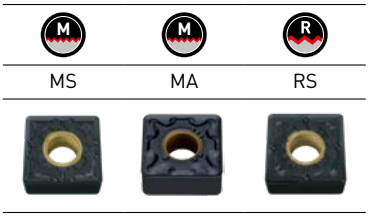
SNMG

NEGATIVE INSERTS (WITH HOLE)

M Class

SNMG





Order number	L M R	MV9005	IC	S	RE	D1
SNMG120404-MS	M	●	12.7	4.76	0.4	5.16
SNMG120408-MS	M	●	12.7	4.76	0.8	5.16
SNMG120412-MS	M	●	12.7	4.76	1.2	5.16
SNMG120404-MA	M	●	12.7	4.76	0.4	5.16
SNMG120408-MA	M	●	12.7	4.76	0.8	5.16
SNMG120412-MA	M	●	12.7	4.76	1.2	5.16
SNMG120408-RS	R	●	12.7	4.76	0.8	5.16
SNMG120412-RS	R	●	12.7	4.76	1.2	5.16
SNMG120416-RS	R	●	12.7	4.76	1.6	5.16

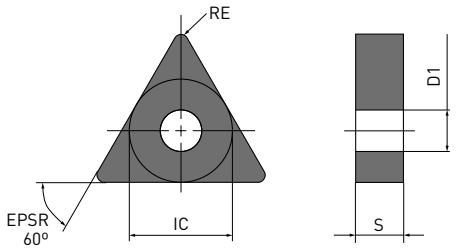
● : Inventory maintained. ★ : Inventory maintained in Japan.

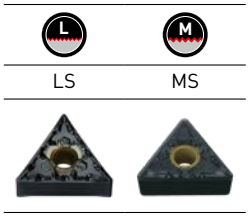
TNMG

NEGATIVE INSERTS (WITH HOLE)

M Class

TNMG





Order number	L	M	R	MV9005	IC	S	RE	D1
TNMG160402-LS	L			●	9.525	4.76	0.2	3.81
TNMG160404-LS	L			●	9.525	4.76	0.4	3.81
TNMG160408-LS	L			●	9.525	4.76	0.8	3.81
TNMG160404-MS		M		●	9.525	4.76	0.4	3.81
TNMG160408-MS		M		●	9.525	4.76	0.8	3.81
TNMG160412-MS		M		●	9.525	4.76	1.2	3.81

1/1

33 Vc

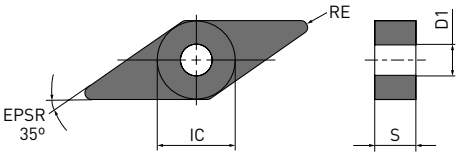
● : Inventory maintained. ★ : Inventory maintained in Japan.

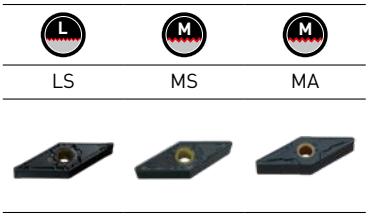
VNMG

NEGATIVE INSERTS (WITH HOLE)

M Class

VNMG





Order number	L M R	MV9005	IC	S	RE	D1
VNMG160402-LS	L	●	9.525	4.76	0.2	3.81
VNMG160404-LS	L	●	9.525	4.76	0.4	3.81
VNMG160408-LS	L	●	9.525	4.76	0.8	3.81
VNMG160404-MS	M	●	9.525	4.76	0.4	3.81
VNMG160408-MS	M	●	9.525	4.76	0.8	3.81
VNMG160404-MA	M	●	9.525	4.76	0.4	3.81
VNMG160408-MA	M	●	9.525	4.76	0.8	3.81

1/1

33 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

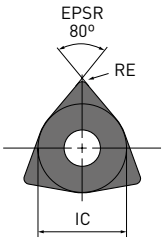
NEW

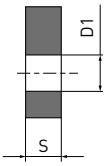
WNMG

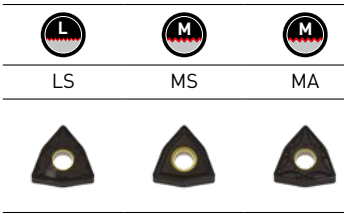
NEGATIVE INSERTS (WITH HOLE)

M Class

WNMG







Order number	L M R	MV9005	IC	S	RE	D1
WNMG080404-LS	L	●	12.7	4.76	0.4	5.16
WNMG080408-LS	L	●	12.7	4.76	0.8	5.16
WNMG080404-MS	M	●	12.7	4.76	0.4	5.16
WNMG080408-MS	M	●	12.7	4.76	0.8	5.16
WNMG080404-MA	M	●	12.7	4.76	0.4	5.16
WNMG080408-MA	M	●	12.7	4.76	0.8	5.16

1/1

33 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

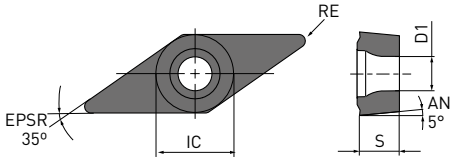
NEW

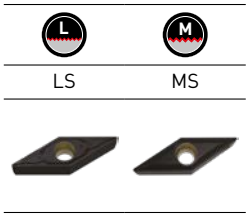
VBMT

5° POSITIVE INSERTS (WITH HOLE)

M Class

VBMT





Order number	L M	MV9005	IC	S	RE	D1
VBMT110304-LS	L	●	6.35	3.18	0.4	2.9
VBMT160404-LS	L	●	9.525	4.76	0.4	4.4
VBMT160408-LS	L	●	9.525	4.76	0.8	4.4
VBMT160412-LS	L	●	9.525	4.76	1.2	4.4
VBMT110304-MS	M	●	6.35	3.18	0.4	2.9
VBMT160404-MS	M	●	9.525	4.76	0.4	4.4
VBMT160408-MS	M	●	9.525	4.76	0.8	4.4
VBMT160412-MS	M	●	9.525	4.76	1.2	4.4

1/1

33 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

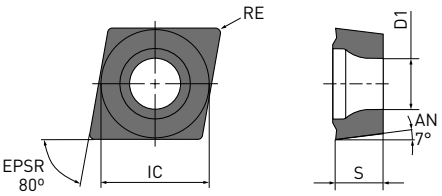
NEW

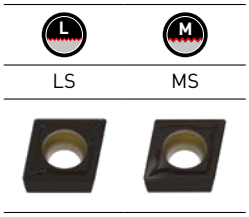
CCMT

7° POSITIVE INSERTS (WITH HOLE)

M Class

CCMT





Order number		MV9005	IC	S	RE	D1
CCMT09T308-LS	L	●	9.525	3.97	0.8	4.4
CCMT09T304-MS	M	●	9.525	3.97	0.4	4.4
CCMT09T308-MS	M	●	9.525	3.97	0.8	4.4

1/1

33 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

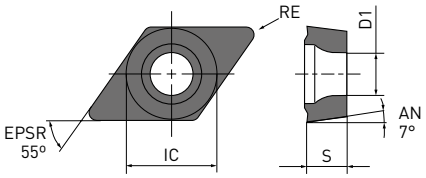
NEW

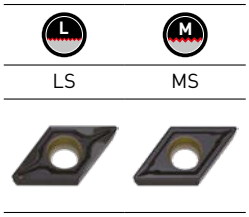
DCMT

7° POSITIVE INSERTS (WITH HOLE)

M Class

DCMT





Order number		MV9005	IC	S	RE	D1
DCMT11T308-LS	L	●	9.525	3.97	0.8	4.4
DCMT11T304-MS	M	●	9.525	3.97	0.4	4.4
DCMT11T308-MS	M	●	9.525	3.97	0.8	4.4

1/1

33 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

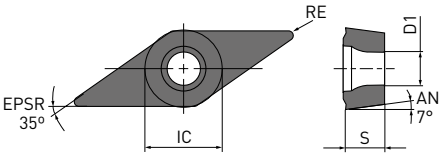
NEW

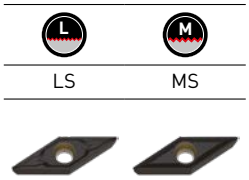
VCMT

7° POSITIVE INSERTS (WITH HOLE)

M Class

VCMT





Order number	L	M	MV9005	IC	S	RE	D1
VCMT110304-LS	L	●		6.35	3.18	0.4	2.8
VCMT160404-LS	L	●		9.525	4.76	0.4	4.4
VCMT160408-LS	L	●		9.525	4.76	0.8	4.4
VCMT110304-MS	M	●		6.35	3.18	0.4	2.8
VCMT160404-MS	M	●		9.525	4.76	0.4	4.4
VCMT160408-MS	M	●		9.525	4.76	0.8	4.4
VCMT160412-MS	M	●		9.525	4.76	1.2	4.4

1/1

33 Vc

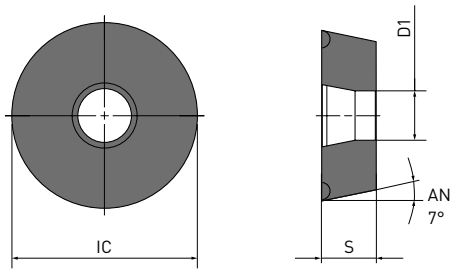
● : Inventory maintained. ★ : Inventory maintained in Japan.

RCMT / RCMX

7° POSITIVE INSERTS (WITH HOLE)

M Class

RCMT / RCMX



Order number		MV9005	IC	S	RE	D1
RCMT0602M0	M	●	6.0	2.38	—	2.8
RCMT0803M0	M	●	8.0	3.18	—	3.4
RCMT10T3M0	M	●	10.0	3.97	—	4.4
RCMT1204M0	M	●	12.0	4.76	—	4.4
RCMT1606M0	M	●	16.0	6.35	—	5.5
RCMX1003M0	M	●	10.0	3.18	—	3.6
RCMX1204M0	M	●	12.0	4.76	—	4.2
RCMX1606M0	M	●	16.0	6.35	—	5.2

1/1

33 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

MV9005

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERTS

CNMG / DNMG / SNMG / TNMG / VNMG / WNMG

	Material	Conditions		Grade		Vc	f	ap
S	Ni based heat resistant alloys (Inconel®718, Hastelloy®, WASPALOY®)	●	L	MV9005	LS	75 – 140	0.10 – 0.25	0.2 – 0.8
		●	M	MV9005	MS	70 – 130	0.15 – 0.30	0.5 – 3.0

1/1

1. Verify the recommended conditions for each boring bar as cutting conditions for internal machining can differ.

POSITIVE INSERTS

CCMT / DCMT / VBMT / VCMT

	Material	Conditions		Grade		Vc	f	ap
S	Ni based heat resistant alloys (Inconel®718, Hastelloy®, WASPALOY®)	●	L	MV9005	LS	65 – 120	0.10 – 0.25	0.2 – 0.8
		●	M	MV9005	MS	55 – 100	0.15 – 0.30	0.5 – 3.0

1/1

1. Verify the recommended conditions for each boring bar as cutting conditions for internal machining can differ.

POSITIVE INSERTS

RCMT / RCMX

	Material	Conditions		Grade	Vc	f	ap
S	Ni based heat resistant alloys (Inconel®718, Hastelloy®, WASPALOY®)	●	M	MV9005	55 – 100	0.25 – 0.45	1.5 – 3.0

1/1

1. Verify the recommended conditions for each boring bar as cutting conditions for internal machining can differ.

Cutting conditions: ●: Stable cutting

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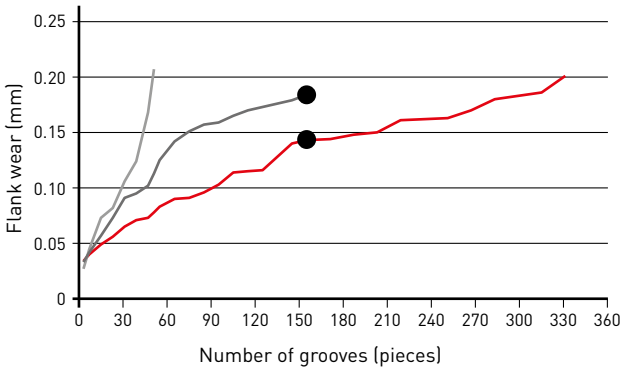
- Outer layer: Better identification of corner use.
- "Super" Nano texture Al_2O_3 layer: Outstanding wear resistance especially at high temperatures.
- Super Tough-Grip: Strong adhesion between the coating layers.
- Fine granular TiCN layer: Coating layer for high wear resistance.
- Cemented carbide substrate: Cemented carbide substrate that is resistant to plastic deformation.

WEAR RESISTANCE COMPARISON WHEN CONTINUOUS, DEEP GROOVE MACHINING OF JIS S45C

Shows double the wear resistance properties compared to conventional product B.

Material	JIS S45C
Holder	GYHL2525M00-M25L
Insert	GY2M – 5 mm
Vc (m/min)	150
f (mm/rev.)	0.25
ap (mm)	20
Coolant	Wet cutting



● Photo taken after machining 155 pieces

MY6125
Flank wear = 0.14 mm

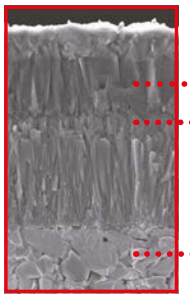
Conventional B
Flank wear = 0.18 mm

■ : MY6125 ■ A ■ B : Conventional tool

INSERT GRADES

P		M		K		S		H		N	
NX2525	●							BC8110	●	RT9010	●
MY5015	●			MY5015	●	VP10RT RT9010 MP9015	●		●		●
VP10RT	●	VP10RT	●	VP10RT	●	VP20RT RT9020 MP9025	●				
VP20RT	✤	VP20RT	✤	VP20RT	✤		✤				

MY6125 NEW



Increasing the coating thickness significantly improves wear resistance, while the latest coating technology, "Super TOUGH-Grip," ensures cutting edge stability.

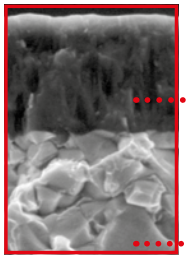
- "Super" Nano texture
- Super Tough-Grip
- Cemented carbide substrate

VP20RT (1st Recommendation)

PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

- MIRACLE coating
- Carbide substrate (HRA90.5)

VP10RT (2nd Recommendation)



PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult-to-cut materials and for extending tool life.

- MIRACLE coating
- Carbide substrate (HRA92.0)

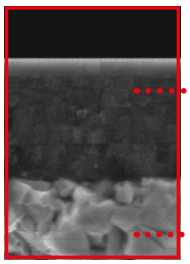
RT9010

First recommended grade for titanium alloys.

BC8110

A coated PCBN grade for continuous cutting, which provides longer life when machining hardened steel.

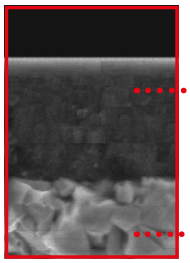
MP9015



PVD coated grade with a cemented carbide substrate. First recommendation for general applications on HRSA materials.

- High Al-rich (Al,Ti)N Single layer coating technology
- Special cemented carbide substrate

MP9025



PVD coated grade with a tough cemented carbide substrate. It provides cutting edge stability for unstable applications on HRSA materials.

- High Al-rich (Al,Ti)N Single layer coating technology
- Special cemented carbide substrate

MY5015

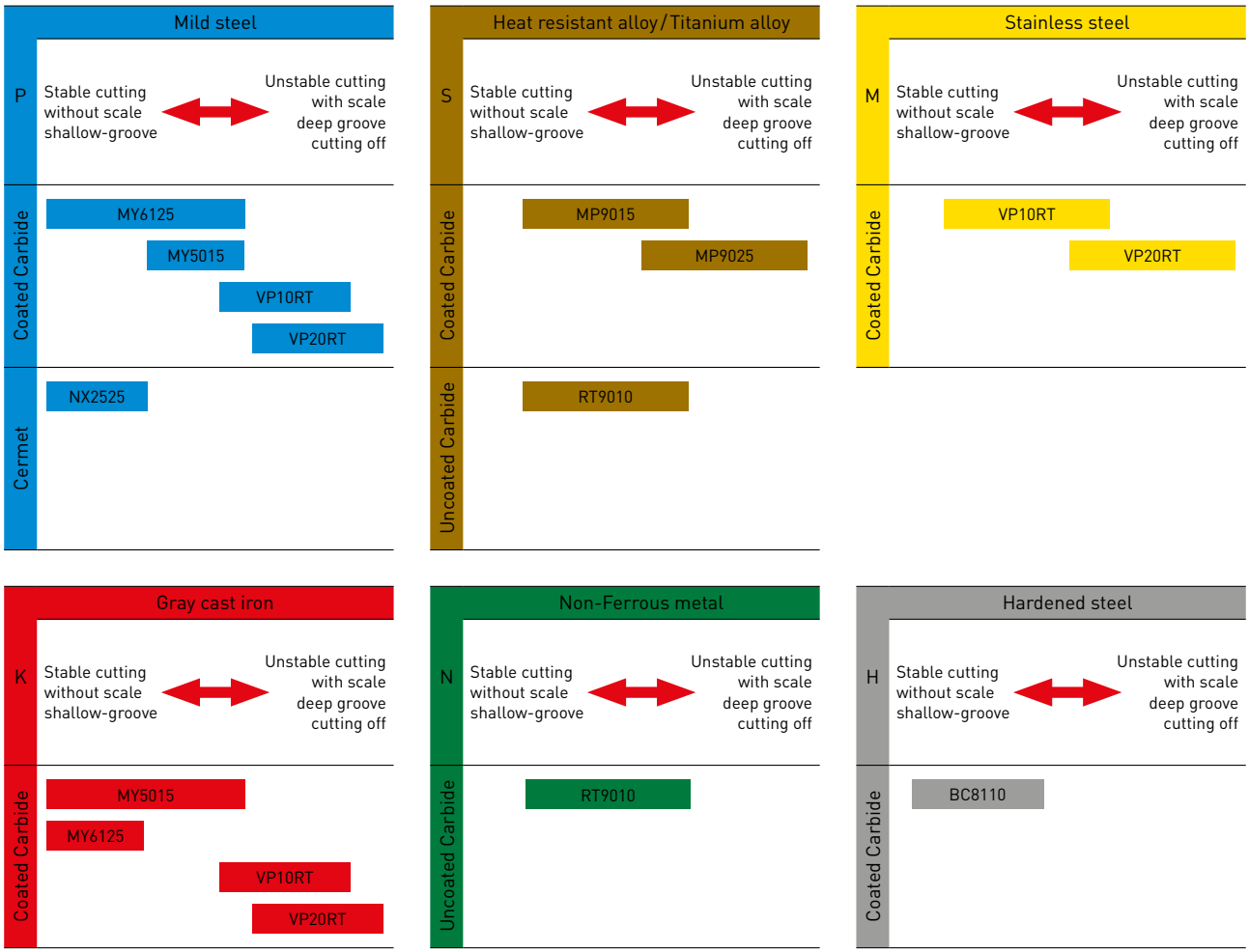
CVD coated grade with excellent wear resistance even at high temperatures. Providing longer tool life when machining cast and ductile cast irons.
Also suitable for high speed continuous cutting of steels.

- CVD coating
- Carbide substrate

NX2525

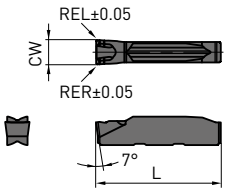
NX2525, a cermet grade for finish machining of steels and for good surface finishes at lower cutting speeds.

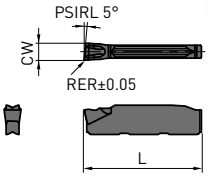
INSERT GRADES



INSERTS (SINGLE END)

Order number	RT9010	RT9020	VP10RT	VP20RT	MY5015	NX2525	BC8110	MP9015	MP9025	Seat size	CW	Tolerance	RER/L	L	Geometry
GROOVING / CUTTING OFF															
GY1M0200D020N-GM			●	●	●			●	●	D	2.00	±0.03	0.2	20.70	GM Breaker (Medium feeds)
GY1M0250E020N-GM			●	●	★			●	●	E	2.50	±0.03	0.2	20.70	
GY1M0300F030N-GM			●	●	●			●	●	F	3.00	±0.03	0.3	20.70	
GY1M0400G030N-GM			●	●	●			●	●	G	4.00	±0.04	0.3	25.65	
GY1M0500H040N-GM			●	●	●			●	●	H	5.00	±0.04	0.4	25.65	
CUTTING OFF															
GY1M0200D020R05-GM			●	●						D	2.00	±0.03	0.2	20.80	R/L05-GM Breaker
GY1M0200D020L05-GM			★	●						D	2.00	±0.03	0.2	20.80	
GY1M0300F030R05-GM			●	●						F	3.00	±0.03	0.3	20.85	
GY1M0300F030L05-GM			●	●						F	3.00	±0.03	0.3	20.85	





Left hand insert shown.

1/1

● : Inventory maintained. ★ : Inventory maintained in Japan.

INSERTS

Order number	MY6125 NEW	RT9010	RT9020	VP10RT	VP20RT	MY5015	NX2525	BC8110	MP9015	MP9025	Seat size	CW	Tolerance	RE R/L	CDX	L	LE	Geometry
GROOVING / CUTTING OFF																		
GY2M0200D020N-GU				●	●		●				D	2.00	±0.03	0.2	19.7	20.70	—	GU (For gummy steel)
GY2M0239E020N-GU				●	●		●				E	2.39	±0.03	0.2	19.8	20.70	—	
GY2M0250E020N-GU				●	●		●				E	2.50	±0.03	0.2	19.5	20.70	—	
GY2M0300F030N-GU				●	●		●				F	3.00	±0.03	0.3	19.3	20.70	—	
GY2M0318F030N-GU				●	●		●				F	3.18	±0.03	0.3	19.3	20.70	—	
GY2M0400G030N-GU				●	●		●				G	4.00	±0.04	0.3	24.2	25.65	—	
GY2M0475H040N-GU				●	●		●				H	4.75	±0.04	0.4	24.2	25.65	—	
GY2M0500H040N-GU				●	●		●				H	5.00	±0.04	0.4	24.2	25.65	—	
GY2M0600J040N-GU				●	●		●				J	6.00	±0.04	0.4	24.2	25.65	—	
GY2M0635J040N-GU				●	●		●				J	6.35	±0.04	0.4	24.2	25.65	—	
GY2M0120B010N-GS				●	●						B	1.20	±0.03	0.1	12.2	14.70	—	GS (Low feeds)
GY2M0150C010N-GS				●	●						C	1.50	±0.03	0.1	13.4	14.70	—	
GY2M0200D020N-GS				●	●		●				D	2.00	±0.03	0.2	18.7	20.70	—	
GY2M0239E020N-GS				●	●		●				E	2.39	±0.03	0.2	18.5	20.70	—	
GY2M0250E020N-GS				●	●		●				E	2.50	±0.03	0.2	18.5	20.70	—	
GY2M0300F020N-GS				●	●		●				F	3.00	±0.03	0.2	18.5	20.70	—	
GY2M0318F020N-GS				●	●		●				F	3.18	±0.03	0.2	18.5	20.70	—	
GY2M0400G020N-GS				●	●		●				G	4.00	±0.04	0.2	23.9	25.65	—	
GY2M0475H030N-GS				●	●		●				H	4.75	±0.04	0.3	23.9	25.65	—	
GY2M0500H030N-GS				●	●		●				H	5.00	±0.04	0.3	24.0	25.65	—	
GY2M0600J030N-GS				●	●		●				J	6.00	±0.04	0.3	24.1	25.65	—	
GY2M0635J030N-GS				●	●		●				J	6.35	±0.04	0.3	24.1	25.65	—	
GY2M0800K030N-GS				●	●						K	8.00	±0.04	0.3	29.1	30.50	—	
GY1M0200D020N-GM				●	●		●		●	●	D	2.00	±0.03	0.2	—	20.70	—	GM (Medium feeds)
GY1M0250E020N-GM				●	●		★		●	●	E	2.50	±0.03	0.2	—	20.70	—	
GY1M0300F030N-GM				●	●		●		●	●	F	3.00	±0.03	0.3	—	20.70	—	
GY1M0400G030N-GM				●	●		●		●	●	G	4.00	±0.04	0.3	—	25.65	—	
GY1M0500H040N-GM				●	●		●		●	●	H	5.00	±0.04	0.4	—	25.65	—	
GY2M0150C020N-GM	●			●	●		●		●	●	C	1.50	±0.03	0.2	13.9	14.70	—	GM (Medium feeds)
GY2M0200D020N-GM	●			●	●	●	●		●	●	D	2.00	±0.03	0.2	19.4	20.70	—	
GY2M0239E020N-GM	●			●	●	●	●		●	●	E	2.39	±0.03	0.2	19.4	20.70	—	
GY2M0250E020N-GM	●			●	●	●	●		●	●	E	2.50	±0.03	0.2	19.4	20.70	—	
GY2M0300F030N-GM	●			●	●	●	●		●	●	F	3.00	±0.03	0.3	19.4	20.70	—	
GY2M0318F030N-GM	●			●	●	●	●		●	●	F	3.18	±0.03	0.3	19.4	20.70	—	
GY2M0400G030N-GM	●			●	●	●	●		●	●	G	4.00	±0.04	0.3	24.4	25.65	—	
GY2M0475H040N-GM	●			●	●	●	●		●	●	H	4.75	±0.04	0.4	24.3	25.65	—	
GY2M0500H040N-GM	●			●	●	●	●		●	●	H	5.00	±0.04	0.4	24.3	25.65	—	
GY2M0600J040N-GM	●			●	●	●	●		●	●	J	6.00	±0.04	0.4	24.3	25.65	—	
GY2M0635J040N-GM	●			●	●	●	●		●	●	J	6.35	±0.04	0.4	24.3	25.65	—	
GY2M0800K050N-GM	●			●	●	●			●	●	K	8.00	±0.04	0.5	29.3	30.50	—	

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*1 Groove width corresponding to the circlip.

● : Inventory maintained. ★ : Inventory maintained in Japan.

INSERTS

Order number	MY6125 NEW	RT9010	RT9020	VP10RT	VP20RT	MY5015	NX2525	BC8110	MP9015	MP9025	Seat size	CW	Tolerance	RE R/L	CDX	L	LE	Geometry
GROOVING / CUTTING OFF																		
GY2G0200D005N-GL		●									D	2.00	±0.02	0.05	19.5	21.05	—	GL Breaker (For aluminium alloys)
GY2G0250E005N-GL		●									E	2.50	±0.02	0.05	19.1	21.05	—	
GY2G0300F005N-GL		●									F	3.00	±0.02	0.05	18.9	21.05	—	
CUTTING OFF																		
GY1M0200D020R05-GM				●	●						D	2.00	±0.03	0.2	—	20.80	—	R/L05-GM Breaker
GY1M0200D020L05-GM				★	●						D	2.00	±0.03	0.2	—	20.80	—	
GY1M0300F030R05-GM				●	●						F	3.00	±0.03	0.3	—	20.85	—	
GY1M0300F030L05-GM				●	●						F	3.00	±0.03	0.3	—	20.85	—	
																		Left hand insert shown.
GY2M0200D020R05-GM				●	●						D	2.00	±0.03	0.2	19.5	20.80	—	R/L05-GM Breaker
GY2M0200D020L05-GM				●	●						D	2.00	±0.03	0.2	19.5	20.80	—	
GY2M0250E020R05-GM				●	●						E	2.50	±0.03	0.2	19.5	20.825	—	
GY2M0250E020L05-GM				●	●						E	2.50	±0.03	0.2	19.5	20.825	—	
GY2M0300F030R05-GM				●	●						F	3.00	±0.03	0.3	19.5	20.85	—	
GY2M0300F030L05-GM				●	●						F	3.00	±0.03	0.3	19.5	20.85	—	
GY2M0400G030R05-GM				●	●						G	4.00	±0.04	0.3	24.5	25.85	—	
GY2M0400G030L05-GM				●	●						G	4.00	±0.04	0.3	24.5	25.85	—	
GY2M0500H040R05-GM				●	●						H	5.00	±0.04	0.4	24.5	25.95	—	
GY2M0500H040L05-GM				●	●						H	5.00	±0.04	0.4	24.5	25.95	—	*Right hand insert shown.*
GY2M0120B010R05-GS				★	★						B	1.20	±0.03	0.1	12.22	14.70	—	R/L05-GS Breaker (Low feeds)
GY2G0150C010R08-GS				●	●						C	1.50	±0.02	0.1	13.17	15.20	—	R08-GS Breaker (Low feeds)
GY2G0200D020R08-GS				●	●						D	2.00	±0.03	0.2	18.85	21.30	—	
GY2G0250E020R08-GS				●	●						E	2.50	±0.03	0.2	19.04	21.50	—	
GY2G0300F020R08-GS				●	●						F	3.00	±0.03	0.2	18.62	21.50	—	
GY2G0150C003R15-GS				●	●						C	1.50	±0.02	0.03	13.17	15.20	—	R15-GS Breaker (Low feeds)
GY2G0150C010R15-GS				●	●						C	1.50	±0.02	0.1	13.17	15.20	—	
GY2G0200D003R15-GS				●	●						D	2.00	±0.03	0.03	18.85	21.30	—	
GY2G0200D010R15-GS				●	●						D	2.00	±0.03	0.1	18.85	21.30	—	
GY2G0250E003R15-GS				●	●						E	2.50	±0.03	0.03	19.04	21.50	—	
GY2G0250E020R15-GS				●	●						E	2.50	±0.03	0.2	19.04	21.50	—	
GY2G0300F003R15-GS				●	●						F	3.00	±0.03	0.03	18.62	21.50	—	
GY2G0300F020R15-GS				●	●						F	3.00	±0.03	0.2	18.62	21.50	—	

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*1 Groove width corresponding to the circlip.

● : Inventory maintained. ★ : Inventory maintained in Japan.

INSERTS

Order number	MY6125 NEW	RT9010	RT9020	VP10RT	VP20RT	MY5015	NX2525	BC8110	MP9015	MP9025	Seat size	CW	Tolerance	RE R/L	CDX	L	LE	Geometry
GROOVING																		
GY1G0200D020N-GFGS								●			D	2.00	±0.03	0.2	—	20.70	2.7	(For hardened material)
GY1G0239E020N-GFGS								●			E	2.39	±0.03	0.2	—	20.70	2.7	
GY1G0250E020N-GFGS								●			E	2.50	±0.03	0.2	—	20.70	2.7	
GY1G0300F020N-GFGS								●			F	3.00	±0.03	0.2	—	20.70	2.7	
GY1G0318F020N-GFGS								●			F	3.18	±0.03	0.2	—	20.70	2.7	
GY1G0400G020N-GFGS								●			G	4.00	±0.03	0.2	—	25.65	2.7	
GY1G0475H020N-GFGS								●			H	4.75	±0.03	0.2	—	25.65	2.7	
GY1G0500H020N-GFGS								●			H	5.00	±0.03	0.2	—	25.65	2.7	
GY1G0600J020N-GFGS								●			J	6.00	±0.03	0.2	—	25.65	2.7	
MULTIFUNCTIONAL GROOVING																		
GY2G0200D020N-MF		●		●	●		●				D	2.00	±0.02	0.2	19.5	21.05	—	MF (Finishing)
GY2G0224D015N-MF*1		●		●	●		●				D	2.24	±0.02	0.15	19.8	21.05	—	
GY2G0239E020N-MF		★		★	★		★				E	2.39	±0.02	0.2	19.2	21.05	—	
GY2G0250E020N-MF		●		●	●		●				E	2.50	±0.02	0.2	19.4	21.05	—	
GY2G0274E020N-MF*1		●		●	●		●				E	2.74	±0.02	0.2	19.7	21.05	—	
GY2G0300F020N-MF		●		●	●		●				F	3.00	±0.02	0.2	19.5	21.05	—	
GY2G0300F040N-MF		●		●	●		●				F	3.00	±0.02	0.4	19.3	21.05	—	
GY2G0318F020N-MF		★		★	★		★				F	3.18	±0.02	0.2	19.5	21.05	—	
GY2G0318F040N-MF		★		★	★		★				F	3.18	±0.02	0.4	19.3	21.05	—	
GY2G0324F020N-MF*1		●		●	●		●				F	3.24	±0.02	0.2	19.5	21.05	—	
GY2G0400G020N-MF		●		●	●		●				G	4.00	±0.02	0.2	24.9	25.95	—	
GY2G0400G040N-MF		●		●	●		●				G	4.00	±0.02	0.4	24.7	25.95	—	
GY2G0400G080N-MF		●		●	●		●				G	4.00	±0.02	0.8	24.3	25.95	—	
GY2G0424G020N-MF*1		●		●	●		●				G	4.24	±0.02	0.2	24.9	25.95	—	
GY2G0475H020N-MF		★		★	★		★				H	4.75	±0.02	0.2	24.4	25.95	—	
GY2G0475H040N-MF		★		★	★		★				H	4.75	±0.02	0.4	24.2	25.95	—	
GY2G0475H080N-MF		★		★	★		★				H	4.75	±0.02	0.8	23.8	25.95	—	
GY2G0500H020N-MF		●		●	●		●				H	5.00	±0.02	0.2	24.4	25.95	—	
GY2G0500H040N-MF		●		●	●		●				H	5.00	±0.02	0.4	24.2	25.95	—	
GY2G0500H080N-MF		●		●	●		●				H	5.00	±0.02	0.8	23.8	25.95	—	
GY2G0524H020N-MF*1		●		●	●		●				H	5.24	±0.02	0.2	24.4	25.95	—	
GY2G0600J020N-MF		●		●	●		●				J	6.00	±0.02	0.2	24.4	25.95	—	
GY2G0600J040N-MF		●		●	●		●				J	6.00	±0.02	0.4	24.2	25.95	—	
GY2G0600J080N-MF		●		●	●		●				J	6.00	±0.02	0.8	23.8	25.95	—	
GY2G0631J020N-MF*1		●		●	●		●				J	6.31	±0.02	0.2	24.4	25.95	—	
GY2G0635J020N-MF		★		★	★		★				J	6.35	±0.02	0.2	24.4	25.95	—	
GY2G0635J040N-MF		★		★	★		★				J	6.35	±0.02	0.4	24.2	25.95	—	
GY2G0635J080N-MF		★		★	★		★				J	6.35	±0.02	0.8	23.8	25.95	—	
GY2M0200D020N-MS	●			●	●	●	●				D	2.00	±0.03	0.2	19.1	20.70	—	MS (Low feeds)
GY2M0250E020N-MS	●			●	●	●	●				E	2.50	±0.03	0.2	19.1	20.70	—	
GY2M0300F020N-MS	●			●	●	●	●				F	3.00	±0.03	0.2	19.2	20.70	—	
GY2M0300F040N-MS	●			●	●	●	●				F	3.00	±0.03	0.4	18.9	20.70	—	
GY2M0400G020N-MS	●			●	●	●	●				G	4.00	±0.04	0.2	24.2	25.65	—	
GY2M0400G040N-MS	●			●	●	●	●				G	4.00	±0.04	0.4	23.9	25.65	—	
GY2M0500H040N-MS	●			●	●	●	●				H	5.00	±0.04	0.4	23.9	25.65	—	
GY2M0500H080N-MS	●			●	●	●	●				H	5.00	±0.04	0.8	23.5	25.65	—	
GY2M0600J040N-MS	●			●	●	●	●				J	6.00	±0.04	0.4	23.9	25.65	—	
GY2M0600J080N-MS	●			●	●	●	●				J	6.00	±0.04	0.8	23.5	25.65	—	
GY2M0800K080N-MS	●			●	●	●					K	8.00	±0.04	0.8	28.5	30.50	—	

3/4

*1 Groove width corresponding to the circlip.

● : Inventory maintained. ★ : Inventory maintained in Japan.

INSERTS

Order number	MY6125 NEW	RT9010	RT9020	VP10RT	VP20RT	MY5015	NX2525	BC8110	MP9015	MP9025	Seat size	CW	Tolerance	RE R/L	CDX	L	LE	Geometry
MULTIFUNCTIONAL GROOVING																		
GY2M0200D020N-MM	●			●	●	●	●		●	●	D	2.00	±0.03	0.2	19.1	20.70	—	MM Breaker (Medium feeds)
GY2M0250E020N-MM	●			●	●	●	●		●	●	E	2.50	±0.03	0.2	19.1	20.70	—	
GY2M0300F020N-MM	●			●	●	●	●		●	●	F	3.00	±0.03	0.2	19.1	20.70	—	
GY2M0300F040N-MM	●			●	●	●	●		●	●	F	3.00	±0.03	0.4	18.9	20.70	—	
GY2M0300F080N-MM	●			●	●	●	●		●	●	F	3.00	±0.03	0.8	18.5	20.70	—	
GY2M0400G020N-MM	●			●	●	●	●		●	●	G	4.00	±0.04	0.2	24.1	25.65	—	
GY2M0400G040N-MM	●			●	●	●	●		●	●	G	4.00	±0.04	0.4	23.9	25.65	—	
GY2M0400G080N-MM	●			●	●	●	●		●	●	G	4.00	±0.04	0.8	23.5	25.65	—	
GY2M0500H040N-MM	●			●	●	●	●		●	●	H	5.00	±0.04	0.4	23.9	25.65	—	
GY2M0500H080N-MM	●			●	●	●	●		●	●	H	5.00	±0.04	0.8	23.5	25.65	—	
GY2M0600J040N-MM	●			●	●	●	●		●	●	J	6.00	±0.04	0.4	23.9	25.65	—	
GY2M0600J080N-MM	●			●	●	●	●		●	●	J	6.00	±0.04	0.8	23.5	25.65	—	
GY2M0800K080N-MM	●			●	●	●	●		●	●	K	8.00	±0.04	0.8	28.5	30.50	—	
GY2M0800K120N-MM	●			●	●	●			●	●	K	8.00	±0.04	1.2	28.1	30.50	—	
COPYING / FOR RECESSING																		
GY2M0200D100N-BM	●			●	●	●	●		●	●	D	2.00	±0.03	1.00	19.5	20.90	—	BM Breaker
GY2M0250E125N-BM	●			●	●	●	●		●	●	E	2.50	±0.03	1.25	19.3	20.90	—	
GY2M0300F150N-BM	●			●	●	●	●		●	●	F	3.00	±0.03	1.50	19.0	20.90	—	
GY2M0318F159N-BM	●			●	●	●	●		●	●	F	3.18	±0.03	1.59	18.9	20.90	—	
GY2M0400G200N-BM	●			●	●	●	●		●	●	G	4.00	±0.04	2.00	23.4	25.80	—	
GY2M0475H238N-BM	●			●	●	●	●		●	●	H	4.75	±0.04	2.38	22.9	25.80	—	
GY2M0500H250N-BM	●			●	●	●	●		●	●	H	5.00	±0.04	2.50	22.8	25.80	—	
GY2M0600J300N-BM	●			●	●	●	●		●	●	J	6.00	±0.04	3.00	22.5	25.90	—	
GY2M0635J318N-BM	●			●	●	●	●		●	●	J	6.35	±0.04	3.18	22.3	25.90	—	
GY2M0800K400N-BM	●			●	●	●			●	●	K	8.00	±0.04	4.00	26.5	30.80	—	
BLANK																		
GY2B0220D020N		●	●				●				D	2.20	±0.10	0.2	—	21.05	—	Flat top 2 Edge type
GY2B0250D020N		●	●				●				D	2.55	±0.10	0.2	—	21.28	—	
GY2B0270E020N		●	●				●				E	2.70	±0.10	0.2	—	21.05	—	
GY2B0300E020N		●	●				●				E	3.05	±0.10	0.2	—	21.28	—	
GY2B0340F020N		●	●				●				F	3.40	±0.10	0.2	—	21.05	—	
GY2B0360F020N		●	●				●				F	3.65	±0.10	0.2	—	21.28	—	
GY2B0420G020N		●	●				●				G	4.20	±0.10	0.2	—	26.00	—	
GY2B0460G020N		●	●				●				G	4.65	±0.10	0.2	—	26.18	—	
GY2B0520H020N		●	●				●				H	5.20	±0.10	0.2	—	26.00	—	
GY2B0560H020N		●	●				●				H	5.65	±0.10	0.2	—	26.18	—	
GY2B0655J020N		●	●				●				J	6.55	±0.10	0.2	—	26.00	—	
GY2B0680J020N		●	●				●				J	6.85	±0.10	0.2	—	26.18	—	
GY2B0880K020N		●	●				●				K	8.85	±0.10	0.2	—	30.88	—	
GY1B0220D020N		●	●				●				D	2.20	±0.10	0.2	—	21.07	—	1 Edge type
GY1B0270E020N		●	●				●				E	2.70	±0.10	0.2	—	21.10	—	
GY1B0340F020N		●	●				●				F	3.40	±0.10	0.2	—	21.00	—	
GY1B0420G020N		●	●				●				G	4.20	±0.10	0.2	—	25.86	—	
GY1B0520H020N		●	●				●				H	5.20	±0.10	0.2	—	25.90	—	
GY1B0655J020N		●	●				●				J	6.55	±0.10	0.2	—	25.90	—	

4/4

*2 Blank inserts to be ground by the customer.

● : Inventory maintained. ★ : Inventory maintained in Japan.

GY GROOVING SERIES

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (FOR EXTERNAL GROOVING AND CUTTING OFF)

	Material	Hardness	Grade	Vc
P	Mild steel	<160HB	VP20RT	155 (100 – 220)
			VP10RT	170 (110 – 230)
			NX2525	150 (90 – 210)
	Carbon steel Alloy steel	160 – 280HB	VP20RT	120 (80 – 180)
			VP10RT	140 (90 – 190)
			MY6125	230 (160 – 300)
			MY5015	180 (110 – 250)
			NX2525	120 (70 – 170)
		≥280HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY6125	185 (110 – 260)
			MY5015	150 (90 – 210)
			NX2525	95 (55 – 135)
M	Stainless steel	≤270HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
K	Gray cast iron	Tensile strength ≤300MPa	VP20RT	120 (80 – 180)
			VP10RT	140 (90 – 190)
			MY5015	120 (140 – 300)
			MY6125	260 (170 – 350)
	Ductile cast iron	Tensile strength ≤800MPa	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY5015	150 (90 – 210)
			MY6125	185 (110 – 260)
N	Aluminium alloy (A6061, 7075)	Content Si<5 %	RT9010	350 (200 – 500)
	Aluminium alloy (AC4B)	Content 5 %≤Si≤10 %	RT9010	350 (200 – 500)
	Aluminium alloy (ADC12, A390)	Content Si>10 %	RT9010	150 (100 – 200)
S	Heat resistant alloy Titanium alloy	—	MP9015	70 (40 – 100)
			MP9025	60 (30 – 90)
			VP20RT	45 (30 – 60)
			VP10RT	55 (40 – 70)
			RT9010	55 (40 – 70)
H	Hardened steel	≥50HRC	BC8110	90 (80 – 120)

1/1

1. VP20RT is the first recommended grade for materials other than hardened steel.
2. For VP10RT, VP20RT, MP9015, MP9025, MY5015, MY6125, wet cutting is recommended.
3. GL Chipbreaker is not recommended for face grooving.

GY GROOVING SERIES FOR EXTERNAL SWISS TYPE LATHES

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (FOR EXTERNAL GROOVING AND CUTTING OFF)

	Material	Hardness	Grade	Vc
P	Mild steel	<160HB	VP20RT	155 (100 – 220)
			VP10RT	170 (110 – 230)
			NX2525	150 (90 – 210)
	Carbon steel Alloy steel	160 – 280HB	VP20RT	120 (80 – 180)
			VP10RT	140 (90 – 190)
			MY6125	230 (160 – 300)
			MY5015	180 (110 – 250)
			NX2525	120 (70 – 170)
		≥280HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY6125	185 (110 – 260)
			MY5015	150 (90 – 210)
			NX2525	95 (55 – 135)
M	Stainless steel	≤270HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
K	Gray cast iron	Tensile strength ≤300MPa	VP20RT	120 (80 – 180)
			VP10RT	140 (90 – 190)
			MY5015	120 (140 – 300)
			MY6125	260 (170 – 350)
	Ductile cast iron	Tensile strength ≤800MPa	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY5015	150 (90 – 210)
			MY6125	185 (110 – 260)
N	Aluminium alloy (A6061, 7075)	Content Si<5 %	RT9010	250 (200 – 500)
	Aluminium alloy (AC4B)	Content 5 %≤Si≤10 %	RT9010	250 (200 – 500)
	Aluminium alloy (ADC12, A390)	Content Si>10 %	RT9010	150 (100 – 200)
S	Heat resistant alloy Titanium alloy	—	MP9015	70 (40 – 100)
			MP9025	60 (30– 90)
			VP20RT	45 (30– 60)
			VP10RT	55 (40– 70)
			RT9010	55 (40– 70)
H	Hardened steel	≥50HRC	BC8110	100 (80 – 120)

1/1

1. For VP10RT, VP20RT, MP9015, MP9025 and MY5015, wet cutting is recommended.

GY GROOVING SERIES FOR EXTERNAL SWISS TYPE LATHES

RECOMMENDED CUTTING SPEED (M/MIN) (FOR EXTERNAL RECESSING)

	Material	Hardness	Grade	Vc
P	Mild steel	<180HB	VP20RT	130 (80 – 180)
			VP10RT	140 (90 – 190)
	Carbon steel Alloy steel	180 – 280HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY6125	180 (110 – 250)
			MY5015	150 (90 – 210)
			NX2525	95 (55 – 135)
		280 – 350HB	VP20RT	90 (50 – 110)
			VP10RT	90 (60 – 120)
			MY6125	145 (100 – 190)
			MY5015	120 (80 – 160)
			NX2525	75 (45 – 105)
M	Stainless steel	≤350HB	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
K	Gray cast iron	Tensile strength ≤350MPa	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY5015	150 (90 – 210)
			MY6125	180 (110 – 250)
	Ductile cast iron	Tensile strength ≤800MPa	VP20RT	80 (50 – 110)
			VP10RT	30 (60 – 120)
			MY5015	120 (80 – 160)
			MY6125	145 (100 – 190)
S	Titanium alloy Heat resistant alloy	—	MP9015	70 (40 – 100)
			MP9025	60 (30 – 90)
			VP20RT	45 (30 – 60)
			VP10RT	55 (40– 70)
			VP20RT	45 (30 – 60)
			VP10RT	55 (40 – 70)

1/1

1. VP20RT is the first recommended grade for materials other than hardened steel.
2. For VP10RT, VP20RT, MP9015, MP9025, MY5015, MY6125, wet cutting is recommended.

GY GROOVING SERIES FOR EXTERNAL SWISS TYPE LATHES

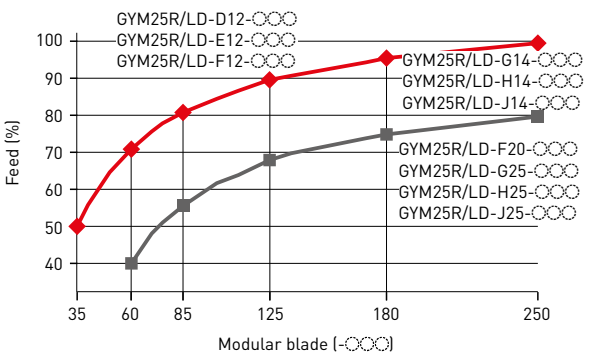
RECOMMENDED CUTTING SPEED (M/MIN) (FOR FACE GROOVING)

	Material	Hardness	Grade	Vc
P	Mild steel	<160HB	VP20RT	130 (80 – 180)
			VP10RT	140 (90 – 190)
			NX2525	120 (70 – 170)
	Carbon steel Alloy steel	160 – 280HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY6125	180 (110 – 250)
			MY5015	150 (90 – 210)
			NX2525	95 (55 – 135)
		≥280HB	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
			MY6125	145 (100 – 190)
			MY5015	120 (80 – 160)
			NX2525	75 (45 – 105)
M	Stainless steel	≤270HB	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
K	Gray cast iron	Tensile strength ≤300MPa	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY5015	150 (90 – 210)
			MY6125	180 (110 – 250)
	Ductile cast iron	Tensile strength ≤800MPa	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
			MY5015	120 (80 – 160)
			MY6125	145 (100 – 190)
S	Heat resistant alloy Titanium alloy	—	MP9015	70 (40 – 100)
			MP9025	60 (30 – 90)
			VP20RT	45 (30 – 60)
			VP10RT	55 (40 – 70)
			RT9010	55 (40 – 70)
H	Hardened steel	≥50HRC	BC8110	80 (60 – 100)

1/1

1. VP20RT is the first recommended grade for materials other than hardened steel.
2. For VP10RT, VP20RT, MP9015, MP9025, MY5015, MY6125, wet cutting is recommended.

RELATIONSHIP BETWEEN THE MODULAR BLADE AND FEED PER ROTATION (FOR FACE GROOVING)



1. Adjust the feed per rotation in the cutting conditions to the percentage shown in the table above.

GY GROOVING SERIES FOR EXTERNAL SWISS TYPE LATHES

RECOMMENDED CUTTING SPEED (M/MIN) (FOR INTERNAL GROOVING)

	Material	Hardness	Grade	Vc
P	Mild steel	<160HB	VP20RT	130 (80 – 180)
			VP10RT	140 (90 – 190)
			NX2525	120 (70 – 170)
	Carbon steel Alloy steel	160 – 280HB	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY5015	150 (90 – 210)
			MY6125	180 (110 – 250)
			NX2525	95 (55 – 135)
		≥280HB	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
			MY6125	145 (100 – 190)
			MY5015	120 (80 – 160)
			NX2525	75 (45 – 105)
M	Stainless steel	≤270HB	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
K	Gray cast iron	Tensile strength ≤300MPa	VP20RT	100 (60 – 140)
			VP10RT	110 (70 – 150)
			MY5015	150 (90 – 210)
			MY6125	180 (110 – 250)
	Ductile cast iron	Tensile strength ≤800MPa	VP20RT	80 (50 – 110)
			VP10RT	90 (60 – 120)
			MY5015	120 (80 – 160)
			MY6125	145 (100 – 190)
S	Heat resistant alloy Titanium alloy	—	MP9015	70 (40 – 100)
			MP9025	60 (30 – 90)
			VP20RT	45 (30 – 60)
			VP10RT	55 (40 – 70)
			RT9010	55 (40 – 70)
H	Hardened steel	≥50HRC	BC8110	80 (60 – 100)

1/1

1. VP20RT is the first recommended grade for materials other than hardened steel.
2. For VP10RT, VP20RT, MP9015, MP9025, MY5015, MY6125, wet cutting is recommended.

VFR

IDEAL FOR MACHINING HARDENED STEELS – REVOLUTIONARY COATING TECHNOLOGY PROVIDES OUTSTANDING TOOL LIFE

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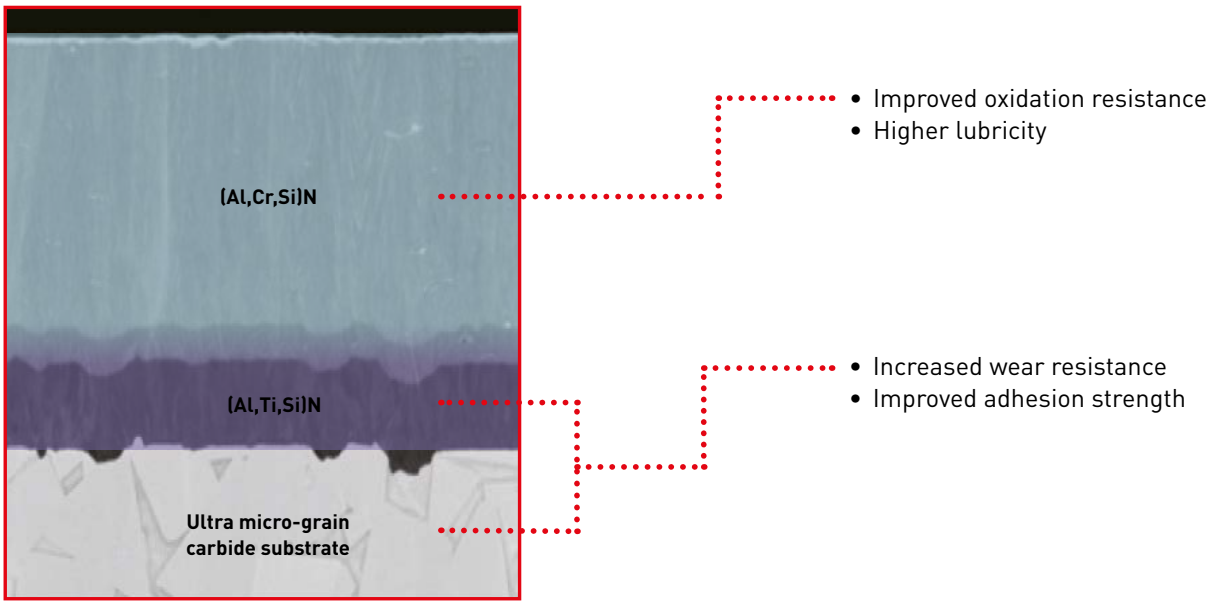
VFR

END MILL SERIES
FOR MILLING HIGH HARDNESS STEELS

NEW COATING TECHNOLOGY

Newly developed (AlCrSi)N multi-layer PVD coating offers higher oxidation resistance and better lubricity, together with improved wear resistance and adhesion strength. Ideal for milling extremely hard materials up to 70 HRC.



TOOL SELECTION ACCORDING TO THE HARDNESS OF THE WORKPIECE MATERIAL

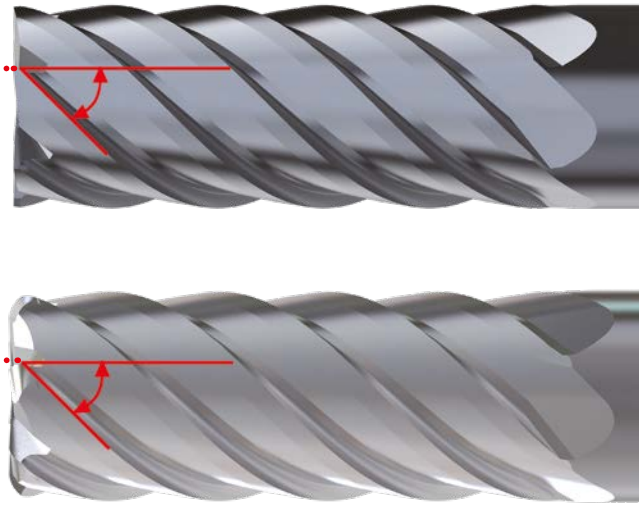
NEW

VFRSD / MD / LD
VFRSDRB / MDRB

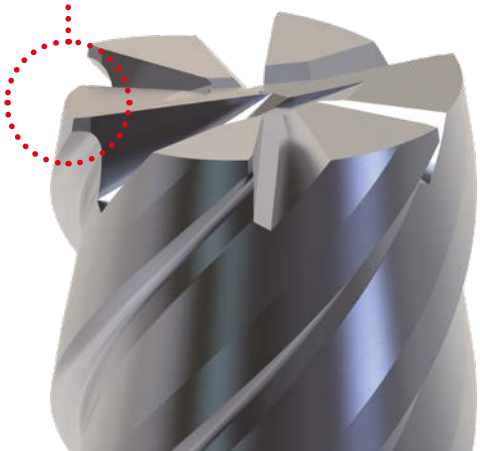
IDEAL CHOICE FOR EFFICIENT MACHINING OF HIGH-HARDNESS MATERIALS

To successfully acheive high-speed machining with multi-flute end mills, a high helix angle flute geometry is required to provide the necessary sharpness and negative rake end cutting edges enables the strength needed for reliability.

HIGH HELIX ANGLE 45°
Improved geometry for high-hardness steel machining.



NEGATIVE RAKE ANGLE CUTTING EDGES
Provides excellent chipping resistance.



NEW

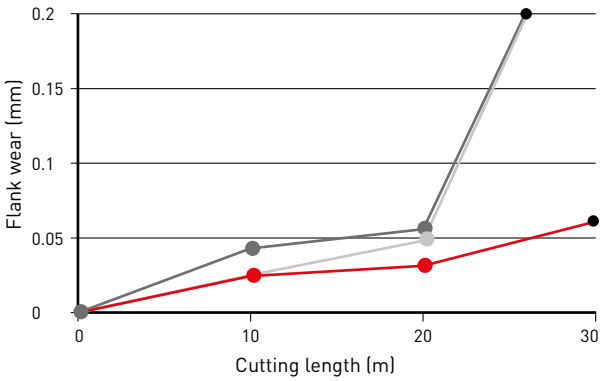
CUTTING PERFORMANCE

VFRSD/MD/LD

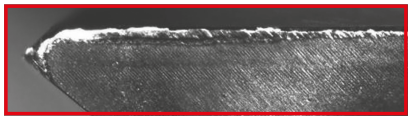
TOOL LIFE COMPARISON MACHINING HAP72 (67.0 HRC)

Compared to conventional products, more than 1.5 times longer tool life and stable machining was achieved.

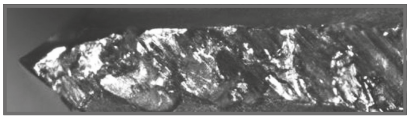
Material	HAP72 (67.0 HRC)
Tool	VFRMDD0600 / DC = 6 mm
n (min^{-1})	5300
Vc (m/min)	100
Vf (mm/min)	1800
ap (mm)	6
ae (mm)	0.1
Overhang length (mm)	22
Cutting mode	Air blow
	Down(climb) cut
Machine	Vertical MC (BT30)



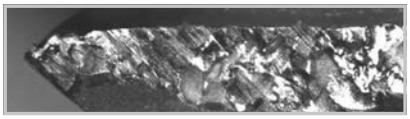
● Photo taken after this length of cutting.



VFRMD



Conventional A



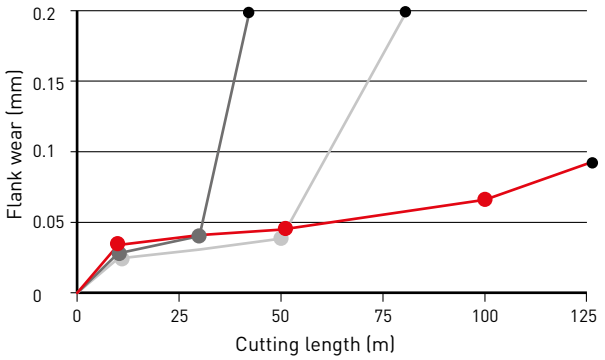
Conventional B

VFRSDRB/MDRB

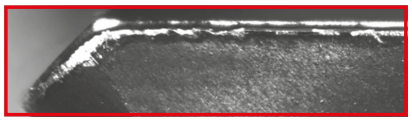
TOOL LIFE COMPARISON MACHINING X153CRMO12/1.2379

Compared to conventional products, double tool life and stability during machining was achieved.

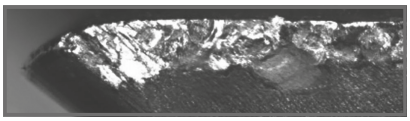
Material	X153CrMo12/1.2379
Tool	VFRMDRBD0600R050 / DC = 6 mm
n (min^{-1})	8000
Vc (m/min)	150
Vf (mm/min)	2400
ap (mm)	5
ae (mm)	0.1
Overhang length (mm)	22
Cutting mode	Air blow
	Down(climb) cut
Machine	Vertical MC (BT40)



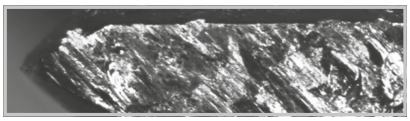
● Photo taken at this length of cutting.



VFRMDRB



Conventional A



Conventional B

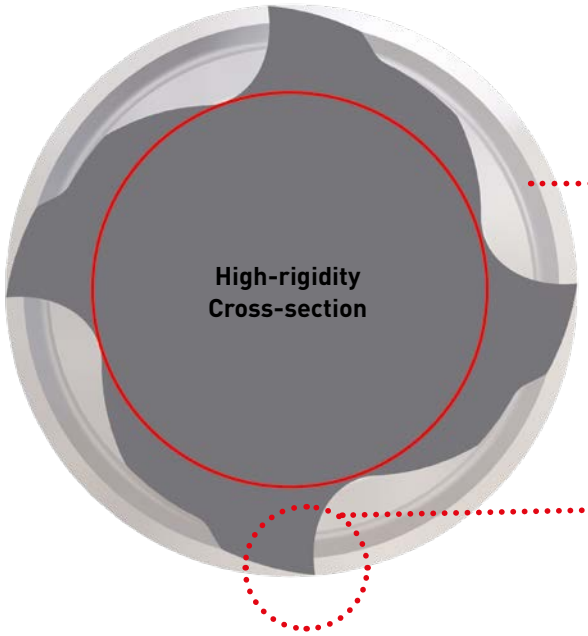
NEW

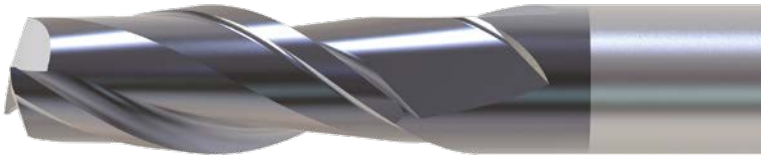
CUTTING PERFORMANCE

VFR2MV/4MV

SUPPRESSES CHATTER AND VIBRATION AND PROVIDES CONSISTENT SURFACE FINISHES

Chatter and vibrations are suppressed through the use of irregular helix and flute pitch geometry, combined with a highly rigid centre cross section.





Irregular pitch flutes and helical angle.

POSITIVE RAKE ANGLE CUTTING EDGES

Low cutting resistance contributes to stable worpiece surface finishes.

NEW

CUTTING PERFORMANCE

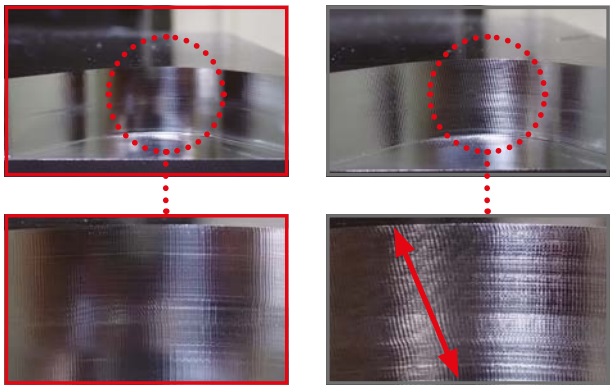
VFR2MV / 4MV

COMPARISON OF SURFACE FINISHES WHEN MACHINING X40CRMOV5-1 / 1.2344

Demonstrates excellent resistance to chatter when machining hardened steels.

Material	X40CrMoV5-1 / 1.2344
Tool	VFR4MVD0600 / DC = 6 mm
n (min^{-1})	5300
Vc (m / min)	100
Vf (mm / min)	1060
ap (mm)	12
ae (mm)	0.3
Cutting mode	Air blow
	Down(climb) cut
	Corner radius machining
Machine	Vertical MC (BT30)

Workpiece geometry with R18



VFRMDRB

CHATTER AND VIBRATION OCCURRED

Conventional

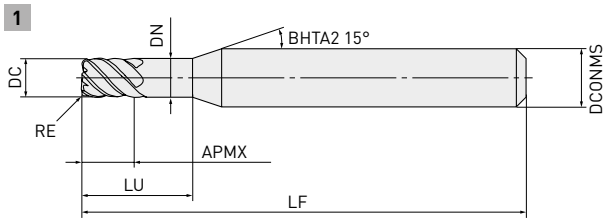
NEW

VFRSDRB

CORNER RADIUS, SHORT CUT LENGTH, 6 FLUTE

H

1



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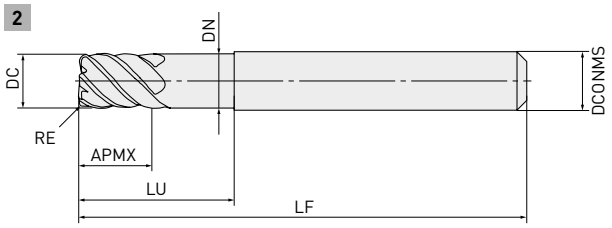


DC
0 - 0.020

DCONMS=6	DCONMS=8, 10	DCONMS=12
0 - 0.005	0 - 0.006	0 - 0.008

- A sharp cutting edge and improved chipping resistance enables highly efficient machining.

Order number	Stock	RE	DC	APMX	LU	DN	LF	DCONMS	ZEFP	Type
VFRSDRBD0300R030	●	0.3	3	3	9	2.9	45	6	6	1
VFRSDRBD0400R030	●	0.3	4	4	12	3.9	45	6	6	1
VFRSDRBD0500R030	●	0.3	5	5	15	4.9	50	6	6	1
VFRSDRBD0600R030	●	0.3	6	6	18	5.85	50	6	6	2
VFRSDRBD0600R050	●	0.5	6	6	18	5.85	50	6	6	2
VFRSDRBD0600R100	●	1	6	6	18	5.85	50	6	6	2
VFRSDRBD0800R030	●	0.3	8	8	24	7.85	60	8	6	2
VFRSDRBD0800R050	●	0.5	8	8	24	7.85	60	8	6	2
VFRSDRBD0800R100	●	1	8	8	24	7.85	60	8	6	2
VFRSDRBD1000R050	●	0.5	10	10	30	9.7	70	10	6	2
VFRSDRBD1000R100	●	1	10	10	30	9.7	70	10	6	2
VFRSDRBD1200R050	●	0.5	12	12	36	11.7	75	12	6	2
VFRSDRBD1200R100	●	1	12	12	36	11.7	75	12	6	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

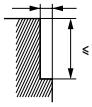
NEW

VFRSDRB

RECOMMENDED CUTTING CONDITIONS

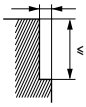
	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	3	32000	3800	0.2
		4	24000	4400	0.2
		6	16000	5800	0.3
		8	12000	5800	0.4
		10	9600	5800	0.5
		12	8000	4800	0.6

1/1



	Material	DC	n	f	ap
H	Hardened steel (55 – 62 HRC)	3	16000	1900	0.1
		4	12000	2200	0.1
		6	8000	2900	0.2
		8	6000	2900	0.2
		10	4800	2900	0.3
		12	4000	2400	0.3
	Hardened steel (62 – 70 HRC)	3	11000	1200	0.05
		4	8000	1300	0.05
		6	5300	1800	0.10
		8	4000	1800	0.10
		10	3200	1800	0.20
		12	2700	1500	0.20

1/1



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. If the machine or workpiece material is not rigid, vibration or abnormal noises may occur.
   In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

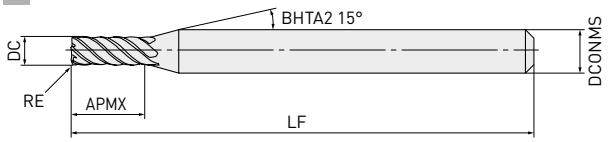
NEW

VFRMDRB

CORNER RADIUS, SHORT CUT LENGTH, 6 FLUTE

H

1



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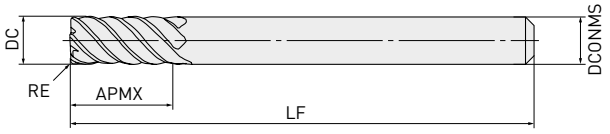

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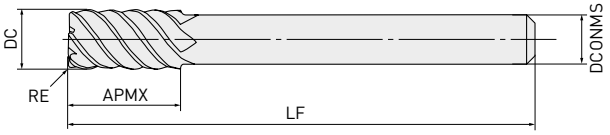


DC≤12	DC≥12
0 - 0.020	0 - 0.030

DCONMS=6	DCONMS=8, 10	DCONMS=12, 16	DCONMS=20
0 - 0.005	0 - 0.006	0 - 0.008	0 - 0.009

- A sharp cutting edge and improved chipping resistance enables highly efficient machining.

Order number	Stock	RE	DC	APMX	LF	DCONMS	ZEFP	Type
VFRMDRBD0300R030	●	0.3	3	10	60	6	6	1
VFRMDRBD0400R030	●	0.3	4	12	60	6	6	1
VFRMDRBD0500R030	●	0.3	5	15	60	6	6	1
VFRMDRBD0600R030	●	0.3	6	15	60	6	6	2
VFRMDRBD0600R050	●	0.5	6	15	60	6	6	2
VFRMDRBD0600R100	●	1	6	15	60	6	6	2
VFRMDRBD0800R030	●	0.3	8	20	75	8	6	2
VFRMDRBD0800R050	●	0.5	8	20	75	8	6	2
VFRMDRBD0800R100	●	1	8	20	75	8	6	2
VFRMDRBD1000R030	●	0.3	10	25	80	10	6	2
VFRMDRBD1000R050	●	0.5	10	25	80	10	6	2
VFRMDRBD1000R100	●	1	10	25	80	10	6	2
VFRMDRBD1200R050	●	0.5	12	30	100	12	6	2
VFRMDRBD1200R100	●	1	12	30	100	12	6	2
VFRMDRBD1600R100	●	1	16	40	110	16	6	2
VFRMDRBD1600R150	●	1.5	16	40	110	16	6	2
VFRMDRBD1800R100	●	1	18	40	120	16	6	3
VFRMDRBD1800R150	●	1.5	18	40	120	16	6	3
VFRMDRBD2000R100	●	1	20	45	125	20	6	2
VFRMDRBD2000R150	●	1.5	20	45	125	20	6	2
VFRMDRBD2000R200	●	2	20	45	125	20	6	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

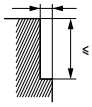
NEW

VFRMDRB

RECOMMENDED CUTTING CONDITIONS

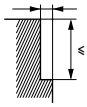
	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	3	32000	3800	0.2
		4	24000	4400	0.2
		6	16000	5800	0.3
		8	12000	5800	0.4
		10	9600	5800	0.5
		12	8000	4800	0.6
		16	6000	3600	0.8
		20	4800	2900	1.0

1/1



	Material	DC	n	f	ap
H	Hardened steel (55 – 62 HRC)	3	16000	1900	0.1
		4	12000	2200	0.1
		6	8000	2900	0.2
		8	6000	2900	0.2
		10	4800	2900	0.3
		12	4000	2400	0.3
		16	3000	1800	0.5
		20	2400	1400	0.5
	Hardened steel (62 – 70 HRC)	3	11000	1200	0.05
		4	8000	1300	0.05
		6	5300	1800	0.10
		8	4000	1800	0.10
		10	3200	1800	0.20
		12	2700	1500	0.20
		16	2000	1100	0.30
		20	1600	880	0.30

1/1



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. If the machine or workpiece material is not rigid, vibration or abnormal noises may occur.
   In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

NEW

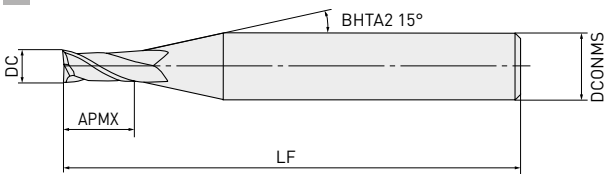
VFR2MV

32.5° – 37.5°

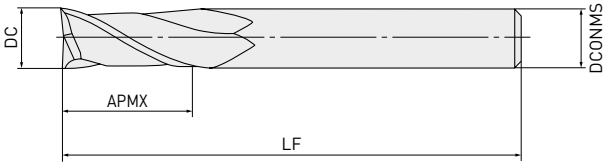
END MILL, MEDIUM CUT LENGTH, 2 FLUTE, IRREGULAR HELIX FLUTES

P H

1



2



DC
0 - 0.020

DCONMS = 6
0 - 0.005

- Irregular helix angle and flute pitch, combined with a highly rigid centre suppresses chatter and vibration.

Order number	Stock	DC	APMX	LF	DCONMS	ZEFP	Type
VFR2MVD0050	●	0.5	1.3	40	4	2	1
VFR2MVD0100	●	1	2.5	40	4	2	1
VFR2MVD0150	●	1.5	3.8	40	4	2	1
VFR2MVD0200	●	2	5	40	4	2	1
VFR2MVD0250	●	2.5	6.3	40	4	2	1
VFR2MVD0300	●	3	7.5	50	6	2	1
VFR2MVD0400	●	4	10	50	6	2	1
VFR2MVD0500	●	5	12.5	50	6	2	1
VFR2MVD0600	●	6	15	50	6	2	2

1/1

59 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

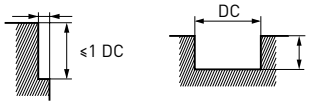
NEW

VFR2MV

RECOMMENDED CUTTING CONDITIONS

	Material	DC	n	f	ap
P	Pre-hardened steel (35 – 45 HRC) Carbon steel	0.5	40000	1000	0.015
		1.0	40000	2000	0.06
		1.5	40000	3000	0.12
		2.0	30000	3000	0.18
		2.5	24000	2600	0.25
		3.0	20000	2300	0.30
		4.0	15000	2000	0.40
		5.0	12000	1600	0.50
		6.0	10000	1400	0.60
H	Hardened steel (45 – 55 HRC)	0.5	40000	960	0.015
		1.0	32000	1600	0.06
		1.5	32000	1900	0.08
		2.0	24000	1900	0.10
		2.5	19000	1600	0.13
		3.0	16000	1400	0.15
		4.0	12000	1200	0.20
		5.0	9000	900	0.25
		6.0	7000	700	0.30
	Hardened steel (55 – 62 HRC)	0.5	30000	600	0.01
		1.0	16000	550	0.05
		1.5	10600	500	0.08
		2.0	8100	400	0.10
		2.5	6400	350	0.13
		3.0	5400	300	0.15
		4.0	4000	240	0.20
		5.0	3200	190	0.20
		6.0	2700	160	0.20
	Hardened steel (62 – 70 HRC)	0.5	19100	260	0.01
		1.0	9600	180	0.01
		1.5	6400	160	0.05
		2.0	4800	120	0.08
		2.5	3800	100	0.08
		3.0	3200	90	0.08
		4.0	2400	80	0.10
		5.0	1900	70	0.10
		6.0	1600	60	0.10

1/1



1. When slotting, reduce the revolutions by 50 – 70 % and the feed rate by 40 – 60 %.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

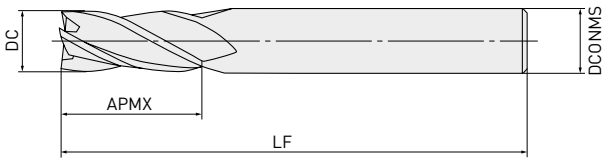
NEW

VFR4MV

END MILL, MEDIUM CUT LENGTH, 4 FLUTE, IRREGULAR HELIX FLUTES

P H

1



DC≤12	DC>12
0 - 0.020	0 - 0.030

DCONMS=6	DCONMS=8, 10	DCONMS=12, 16	DCONMS=20
0 - 0.005	0 - 0.006	0 - 0.008	0 - 0.009

- Irregular helix angle and flute pitch, combined with a highly rigid centre suppresses chatter and vibration.

Order number	Stock	DC	APMX	LF	DCONMS	ZEFP	Type
VFR4MVD0600	●	6	15	50	6	4	1
VFR4MVD0800	●	8	20	60	8	4	1
VFR4MVD1000	●	10	25	70	10	4	1
VFR4MVD1200	●	12	30	90	12	4	1
VFR4MVD1600	●	16	40	100	16	4	1
VFR4MVD2000	●	20	50	110	20	4	1

1/1

61 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

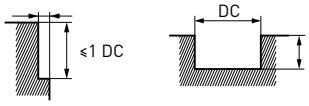
NEW

VFR4MV

RECOMMENDED CUTTING CONDITIONS

	Material	DC	n	f	ap
P	Pre-hardened steel (35 – 45 HRC) Carbon steel	6	10000	2100	0.6
		8	8000	1500	0.8
		10	6400	1400	1.0
		12	5400	1200	1.0
		16	2400	550	3.0
		20	1900	480	4.0
H	Hardened steel (45 – 55 HRC)	6	7000	1400	0.3
		8	5600	1100	0.4
		10	4500	950	0.5
		12	3800	860	0.5
		16	1200	280	0.8
		20	1000	240	1.0
	Hardened steel (55 – 62 HRC)	6	2700	320	0.2
		8	2000	240	0.2
		10	1600	210	0.3
		12	1300	160	0.3
		16	1000	130	0.3
		20	800	100	0.3
	Hardened steel (62 – 70 HRC)	6	1600	130	0.1
		8	1200	100	0.1
		10	960	80	0.2
		12	800	60	0.2
		16	600	50	0.2
		20	480	40	0.2

1/1



1. When slotting, reduce the revolutions by 50 – 70 % and the feed rate by 40 – 60 %.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

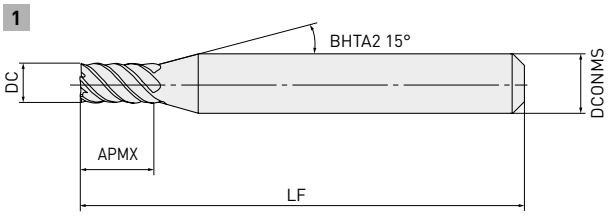
NEW

VFRSD

END MILL, SHORT CUT LENGTH, 4/6 FLUTE

H

1



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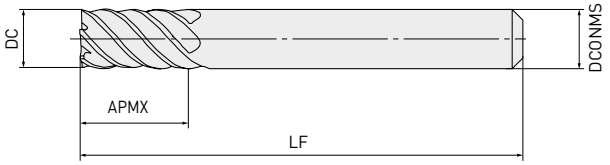


DC
0 - 0.020

DCONMS=6	DCONMS=8, 10	DCONMS=12
0 - 0.005	0 - 0.006	0 - 0.008

- A sharp cutting edge and improved chipping resistance enables highly efficient machining.

Order number	Stock	DC	APMX	LF	DCONMS	ZEFP	Type
VFRSDD0100	●	1	2	45	6	4	1
VFRSDD0150	●	1.5	3	45	6	4	1
VFRSDD0200	●	2	4	45	6	4	1
VFRSDD0250	●	2.5	5	45	6	4	1
VFRSDD0300	●	3	6	45	6	6	1
VFRSDD0350	●	3.5	7	45	6	6	1
VFRSDD0400	●	4	8	45	6	6	1
VFRSDD0500	●	5	10	50	6	6	1
VFRSDD0600	●	6	12	50	6	6	2
VFRSDD0800	●	8	16	60	8	6	2
VFRSDD1000	●	10	20	70	10	6	2
VFRSDD1200	●	12	24	75	12	6	2

1/1

1. FHA: DC < 3 mm = 30°, DC ≥ 3 mm = 45°

● : Inventory maintained. ★ : Inventory maintained in Japan.

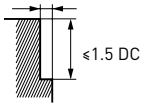
NEW

VFRSD

RECOMMENDED CUTTING CONDITIONS

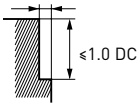
	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	1	40000	1200	0.05
		2	40000	2000	0.10
		3	32000	3800	0.20
		4	24000	4400	0.20
		6	16000	5800	0.30
		8	12000	5800	0.40
		10	9600	5800	0.50
		12	8000	4800	0.60

1/1



	Material	DC	n	f	ap
H	Hardened steel (55 – 62 HRC)	1	40000	800	0.03
		2	24000	1000	0.05
		3	16000	1900	0.10
		4	12000	2200	0.10
		6	8000	2900	0.20
		8	6000	2900	0.20
		10	4800	2900	0.30
		12	4000	2400	0.30
	Hardened steel (62 – 70 HRC)	1	32000	500	0.02
		2	16000	600	0.05
		3	11000	1200	0.05
		4	8000	1300	0.05
		6	5300	1800	0.10
		8	4000	1800	0.10
		10	3200	1800	0.20
		12	2700	1500	0.20

1/1



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

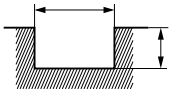
NEW

VFRSD

SLOT MILLING WITH SMALL DIAMETER TOOLS

	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	1	15000	300	0.1
		2	8000	320	0.2
	Hardened steel (55 – 62 HRC)	1	9500	110	0.05
		2	4800	190	0.10

1/1



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

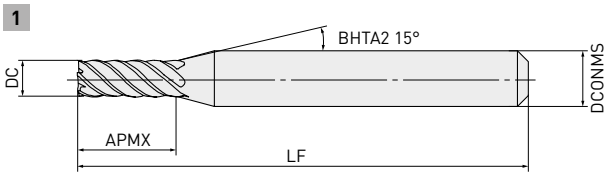
NEW

VFRMD

END MILL, MEDIUM CUT LENGTH, 4/6 FLUTE

H

1



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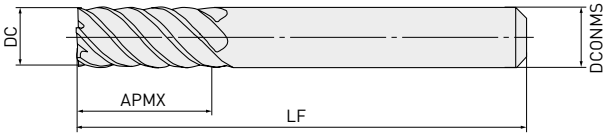

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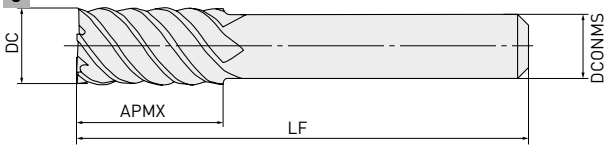


DC≤12	DC>12
0 - 0.020	0 - 0.030

h5

DCONMS=6	DCONMS=8, 10	DCONMS=12, 16	DCONMS=20, 25
0 - 0.005	0 - 0.006	0 - 0.008	0 - 0.009

- A sharp cutting edge and improved chipping resistance enables highly efficient machining.

Order number	Stock	DC	APMX	LF	DCONMS	ZEFP	Type
VFRMDD0100	●	1	3.5	60	6	4	1
VFRMDD0150	●	1.5	5	60	6	4	1
VFRMDD0200	●	2	7	60	6	4	1
VFRMDD0250	●	2.5	8	60	6	4	1
VFRMDD0300	●	3	10	60	6	6	1
VFRMDD0400	●	4	12	60	6	6	1
VFRMDD0500	●	5	15	60	6	6	1
VFRMDD0600	●	6	15	60	6	6	2
VFRMDD0800	●	8	20	75	8	6	2
VFRMDD1000	●	10	25	80	10	6	2
VFRMDD1200	●	12	30	100	12	6	2
VFRMDD1400	●	14	35	105	12	6	3
VFRMDD1500	●	15	40	110	16	6	1
VFRMDD1600	●	16	40	110	16	6	2
VFRMDD1800	●	18	40	120	16	6	3
VFRMDD2000	●	20	45	125	20	6	2
VFRMDD2200	●	22	45	135	20	6	3
VFRMDD2500	●	25	60	160	25	6	2

1/1

1. FHA: DC < 3 mm = 30°, DC ≥ 3 mm = 45°

66 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

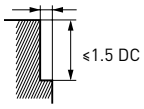
NEW

VFRMD

RECOMMENDED CUTTING CONDITIONS

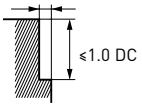
	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	1	40000	1200	0.05
		2	40000	2000	0.10
		3	32000	3800	0.20
		4	24000	4400	0.20
		6	16000	5800	0.30
		8	12000	5800	0.40
		10	9600	5800	0.50
		12	8000	4800	0.60
		16	6000	3600	0.80
		20	4800	2900	1.00
		25	3800	2300	1.00

1/1



	Material	DC	n	f	ap
H	Hardened steel (55 – 62 HRC)	1	40000	800	0.03
		2	24000	1000	0.05
		3	16000	1900	0.10
		4	12000	2200	0.10
		6	8000	2900	0.20
		8	6000	2900	0.20
		10	4800	2900	0.30
		12	4000	2400	0.30
		16	3000	1800	0.50
		20	2400	1400	0.50
		25	1900	1100	0.50
	Hardened steel (62 – 70 HRC)	1	32000	500	0.02
		2	16000	600	0.05
		3	11000	1200	0.05
		4	8000	1300	0.05
		6	5300	1800	0.10
		8	4000	1800	0.10
		10	3200	1800	0.20
		12	2700	1500	0.20
		16	2000	1100	0.30
		20	1600	880	0.30
		25	1300	720	0.30

1/1



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

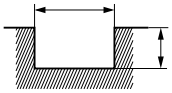
NEW

VFRMD

SLOT MILLING WITH SMALL DIAMETER TOOLS

	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	1	15000	300	0.1
		2	8000	320	0.2
	Hardened steel (55 – 62 HRC)	1	9500	110	0.05
		2	4800	190	0.10

1/1



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate and depth of cut according to the table above.

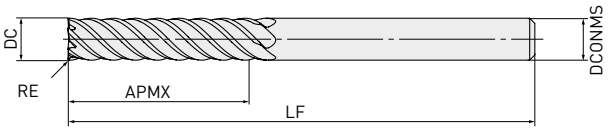
NEW

VFRLD

END MILL, LONG CUT LENGTH, 6 FLUTE

H

1



DC≤12	DC>12
0 - 0.020	0 - 0.030

DCONMS=6	DCONMS=8, 10	DCONMS=12, 16	DCONMS=20, 25
0 - 0.005	0 - 0.006	0 - 0.008	0 - 0.009

- A sharp cutting edge and improved chipping resistance enables highly efficient machining.

Order number	Stock	DC	APMX	LF	DCONMS	ZEFP	Type
VFRLDD0600	●	6	26	70	6	6	1
VFRLDD0800	●	8	36	90	8	6	1
VFRLDD1000	●	10	46	100	10	6	1
VFRLDD1200	●	12	56	110	12	6	1
VFRLDD1600	●	16	66	130	16	6	1
VFRLDD2000	●	20	76	140	20	6	1
VFRLDD2500	●	25	92	180	25	6	1

1/1

69 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

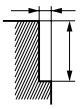
NEW

VFRLD

RECOMMENDED CUTTING CONDITIONS

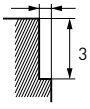
	Material	DC	n	f	ap
H	Hardened steel (45 – 55 HRC)	6	2200	460	0.06
		8	1700	430	0.08
		10	1300	400	0.10
		12	1100	360	0.12
		16	840	310	0.16
		20	670	260	0.20
		25	530	230	0.25

1/1



	Material	DC	n	f	ap
H	Hardened steel (55 – 62 HRC)	6	1900	340	0.03
		8	1400	320	0.04
		10	1100	310	0.05
		12	930	280	0.06
		16	700	220	0.08
		20	560	190	0.10
		25	450	170	0.13
	Hardened steel (62 – 70 HRC)	6	1500	260	0.03
		8	1100	240	0.04
		10	890	210	0.05
		12	740	200	0.06
		16	560	170	0.08
		20	450	150	0.10
		25	360	120	0.13

1/1



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NEW

MP1200 SERIES

PVD COATED CARBIDE GRADE FOR MILLING

Interested in more...

B272

www.mmte-mediastore.net

MITSUBISHI MATERIALS

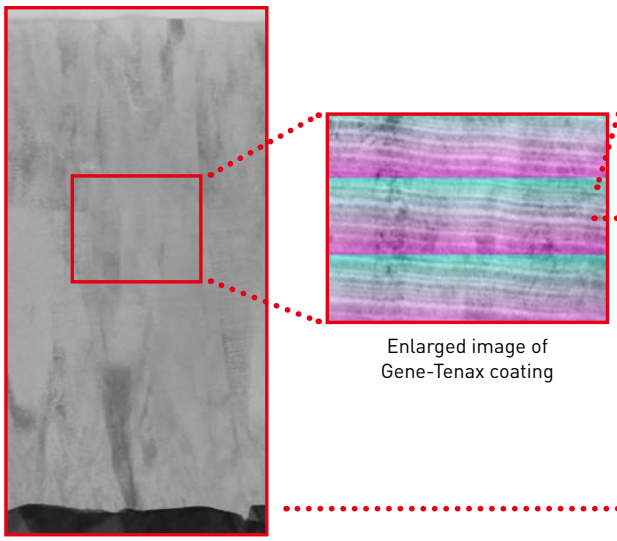
MP1220 / MP1230 / MP1240

MULTI-LAYER PVD COATING FOR MILLING

ONE INSERT SERIES TO SOLVE ALL PROBLEMS WHEN MACHINING STEELS, STAINLESS STEELS, HEAT RESISTANT AND TITANIUM ALLOYS.

GENE-TENAX COATING

By controlling the coating structure at the nano level, damage to the coating has been vastly reduced compared to conventional lamination. By successfully laminating multiple films, simultaneous strengthening of heat, wear and welding resistance is achieved. Additionally the coating is now much less prone to cracking and with the increased adhesive strength, the most stable grade for milling has been created.



Enlarged image of Gene-Tenax coating

Dedicated carbide base material

Al-RICH TECHNOLOGY AlTiN-BASED

Improved wear and heat resistance.

ORIGINAL AlTiN COMPOSITE FUNCTIONAL LAYER

Increasingly resistant to oxidation and welding.

Technology to improve adhesion strength.

ACHIEVES TOUGHNESS FOR A WIDE RANGE OF WORK MATERIALS

STEEL MACHINING DAMAGE

Cutting edge that is resistant to wear when machining steel

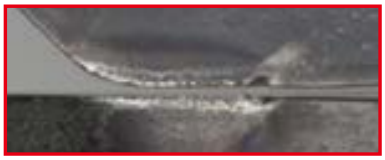
Thermal cracking

STAINLESS STEEL MACHINING DAMAGE

Cutting edge that is less susceptible to notching when machining stainless steel

Notching

HEAT RESISTANT AND TITANIUM ALLOYS MACHINING DAMAGE



Cutting edge that is resistant to chipping when machining heat resistant and titanium alloys

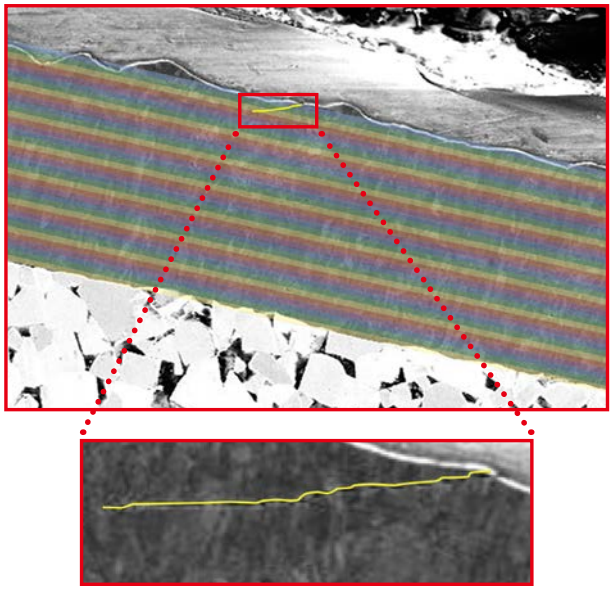
Chipped cutting edge

■ : MP1200 Series ■ : Conventional PVD

NEW MULTILAYER TECHNOLOGY

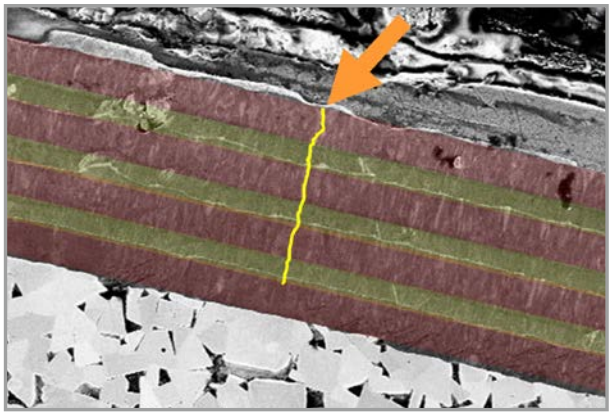
The adoption of a new multi-layer technology has succeeded in suppressing crack propagation and dramatically improved fracture resistance when compared to conventional technology.

MP1200 SERIES MULTI-LAYER TECHNOLOGY



Prevents cracks

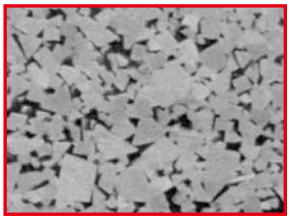
CONVENTIONAL LAYER TECHNOLOGY



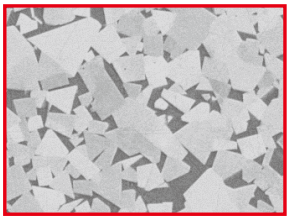
MULTI-GRADE SYSTEM

Using simulation technology, precise analysis of the cutting edge load and temperature when machining different workpiece materials was carried out. This led to the creation of different substrates for three different grades and ensures optimal performance for each type of workpiece material. Ensuring the best performance over a wide range of applications.

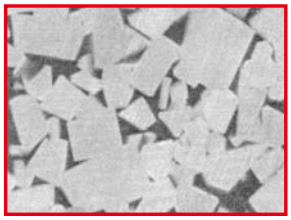
MP1220



MP1230



MP1240



2µm

SELECTION GUIDELINES

Steel, Carbon steel — **Stainless steel** — **Titanium alloys, Heat resistant alloys**

- Hard grade
- Stable cutting
- Emphasis on wear resistance and mechanical properties

- Tough grade
- Unstable cutting
- Emphasis on fracture resistance and thermal properties

CUTTING PERFORMANCE

PVD COATED CARBIDE GRADE FOR MILLING

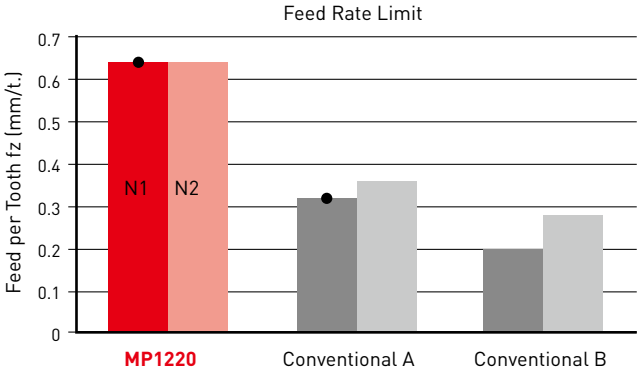
FRACTURE RESISTANCE COMPARISON WHEN MACHINGING 42CrMo4

The MP1220 grade suppresses breakage during high-load machining and exhibits more than twice the breakage resistance of conventional product A.

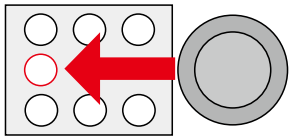
Material	DIN 1.7225
Tool	ASX445 DC = 125 mm
Insert	MP1220 JM
Vc (m / min)	200
ap (mm)	3
ae (mm)	100
Cutting mode	Dry cutting Single insert Centre cut

MP1220

Conventional A



● Photo taken at this length of cutting.



Machining image

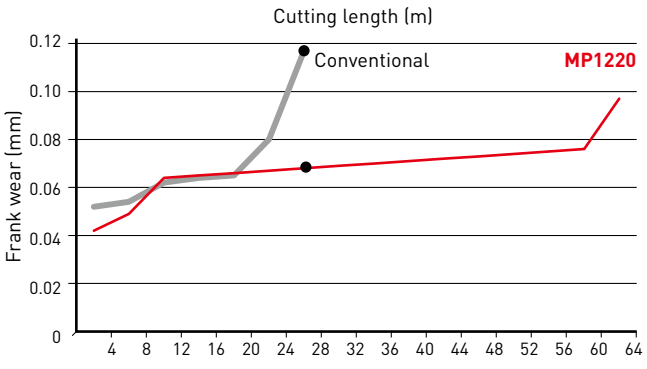
WEAR RESISTANCE COMPARISON WHEN MACHINING 42CrMo4

Stable machining is achieved by suppressing rake face wear and preventing the occurrence of thermal cracks.

Material	DIN 1.7225
Tool	VPX300 DC = 32 mm
Insert	MP1220 M
Vc (m / min)	200
fz (mm/t.)	0.15
ap (mm)	4
ae (mm)	16
Cutting mode	Dry cutting Single insert Centre cut

MP1220

Conventional



● Taken after cutting length of 28 m

MP1200 SERIES

INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Face milling							
SNGU140812ANER-L	●	●	●	G	Low resistance	Light cutting	WSX445
SNGU140812ANEL-L	★	★		G	Low resistance	Light cutting	
SNGU140812ANER-M	●	●	●	G	1st recommendation	General cutting	
SNGU140812ANEL-M	★	★		G	1st recommendation	General cutting	
SNMU140812ANER-M	●	●	●	M	1st recommendation	General cutting	
SNMU140812ANEL-M	●	★		M	1st recommendation	General cutting	
SNMU140812ANER-R	●	●	●	M	Strong cutting edge	Rough cutting	
SNMU140812ANEL-R	★	★		M	Strong cutting edge	Rough cutting	
SNMU140812ANER-H	●	●	●	M	Strong cutting edge	Heavy cutting	
WNGU1406ANEN8C-M	●			G	Wiper	Finish cutting	WSX445
NNMU130508ZER-L	●	●	★	M	Low resistance	General cutting	AHX440S
NNMU130508ZEN-M	●	●	●	M	1st recommendation	General cutting	
WNEU1305ZEN4C-M	★			E	Wiper	Finish cutting	AHX440S
NNMU130532ZEN-M	●	●	●	M	1st recommendation	High feed cutting	AHX475S
NNMU130532ZEN-R	●	●	★	M	Strong cutting edge	High feed cutting	
NNMU200608ZEN-MK	●			M	1st recommendation	General cutting	AHX640S
NNMU200608ZEN-HK	●			M	Strong cutting edge	General cutting	
NNMU200712ZER-L	●	●	●	M	Low resistance	General cutting	
NNMU200708ZEN-M	●	●	●	M	1st recommendation	General cutting	
WNEU2007ZEN7C-M	★			E	Wiper	Finish cutting	AHX640S
SEET13T3AGEN-JL	●	●	●	E	Low resistance	Finish – Light cutting	ASX445
SEMT13T3AGSN-JM	●	●	●	M	1st recommendation	Light – Rough cutting	
SEMT13T3AGSN-JH	●	●	●	M	Strong cutting edge	Medium – Heavy cutting	

(10 inserts in one case.)

● : Inventory maintained. ★ : Inventory maintained in Japan.

MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Shoulder milling							
SOMT083304PEER-L	●	●	●	M	Low resistance, RE0.4	Stable cutting	**ASX300**
SOMT083308PEER-L	●	●	●	M	Low resistance, RE0.8	Stable cutting	
SOMT083308PEER-M	●	●	●	M	RE0.8	General cutting	
SOMT083312PEER-M	●	●	●	M	RE1.2	General cutting	
SOMT083316PEER-M	●	●	●	M	RE1.6	General cutting	
SOMT083308PEER-R	●	●	●	M	Strong cutting edge, RE0.8	Unstable cutting	
SOMT083312PEER-R	●	●	●	M	Strong cutting edge, RE1.2	Unstable cutting	
SOMT083316PEER-R	●	●	●	M	Strong cutting edge, RE1.6	Unstable cutting	
SOET12T308PEER-JL	●	●	●	E	Low resistance	Finish – Light cutting	**ASX400**
SOMT12T308PEER-JM	●	●	●	M	Left-hand	Cast iron rough cutting	
SOMT12T308PEER-JH	●	●	●	M	Strong cutting edge	Medium – Heavy cutting	
SOMT12T320PEER-FT	●	★	★	M	Strong cutting edge	Heavy and interrupted cutting	
SONX1206PER	★			N	Right-hand	Cast iron rough cutting	**VOX400**
							
WOEX1206PER5C	★			E	Wiper	Finish cutting	**VOX400**
							
6NGU0906040PNER-L	★	★	★	G	Low resistance, RE0.4	Stable cutting	**WWX200**
6NGU0906080PNER-L	★	★	★	G	Low resistance, RE0.8	Stable cutting	
6NMU0906040PNER-M	●	●	●	M	RE0.4	General cutting	
6NMU0906080PNER-M	●	●	●	M	RE0.8	General cutting	
6NMU0906080PNER-R	●	●	●	M	Strong cutting edge, RE0.8	Unstable cutting	
6NGU1409040PNER-L	●	●	●	G	Low resistance, RE0.4	Stable cutting	**WWX400**
6NGU1409080PNER-L	●	●	●	G	Low resistance, RE0.8	Stable cutting	
6NGU1409040PNER-M	★	●	★	G	RE0.4	General cutting	
6NGU1409080PNER-M	●	●	●	G	RE0.8	General cutting	
6NMU1409040PNER-M	●	●	●	M	RE0.4	General cutting	
6NMU1409080PNER-M	●	●	●	M	RE0.8	General cutting	
6NMU1409160PNER-M	●	●	●	M	RE1.6	General cutting	
6NMU1409200PNER-M	★	★	★	M	RE2.0	General cutting	
6NMU1409080PNER-R	●	●	●	M	RE0.8	Unstable cutting	
6NMU1409160PNER-R	★	★	★	M	RE1.6	Unstable cutting	
6NMU1409200PNER-R	★	★	★	M	RE2.0	Unstable cutting	
2NGU1406ZNER6C-M	●			G	Wiper	Finish cutting	**WWX400**
							

1/1

(10 inserts in one case.)

● : Inventory maintained. ★ : Inventory maintained in Japan.

MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Side cutter							
LNGU130804PNER-M	★			G	Low resistance, RE1 0.4	Right-hand	DCV4
LNGU130804PNEL-M	★			G	Low resistance, RE1 0.4	Left-hand	
LNGU130808PNER-M	★			G	Low resistance, RE1 0.8	Right-hand	
LNGU130808PNEL-M	★			G	Low resistance, RE1 0.8	Left-hand	
LNGU130812PNER-M	★			G	Low resistance, RE1 1.2	Right-hand	
LNGU130812PNEL-M	★			G	Low resistance, RE1 1.2	Left-hand	
LNGU130816PNER-M	★			G	Low resistance, RE1 1.6	Right-hand	
LNGU130816PNEL-M	★			G	Low resistance, RE1 1.6	Left-hand	
LNGU130820PNER-M	★			G	Low resistance, RE1 2.0	Right-hand	
LNGU130820PNEL-M	★			G	Low resistance, RE1 2.0	Left-hand	
LNGU130824PNER-M	★			G	Low resistance, RE1 2.4	Right-hand	
LNGU130824PNEL-M	★			G	Low resistance, RE1 2.4	Left-hand	
LNGU130830PNER-M	●			G	Low resistance, RE1 3.0	Right-hand	
LNGU130830PNEL-M	●			G	Low resistance, RE1 3.0	Left-hand	
LNGU130840PNER-M	★			G	Low resistance, RE1 4.0	Right-hand	
LNGU130840PNEL-M	★			G	Low resistance, RE1 4.0	Left-hand	
LNGU130850PNER-M	★			G	Low resistance, RE1 5.0	Right-hand	
LNGU130850PNEL-M	★			G	Low resistance, RE1 5.0	Left-hand	
LNGU130804PNER-R	★			G	Strong cutting edge, RE1 0.4	Right-hand	
LNGU130804PNEL-R	★			G	Strong cutting edge, RE1 0.4	Left-hand	
LNGU130808PNER-R	★			G	Strong cutting edge, RE1 0.8	Right-hand	
LNGU130808PNEL-R	★			G	Strong cutting edge, RE1 0.8	Left-hand	
LNGU130812PNER-R	★			G	Strong cutting edge, RE1 1.2	Right-hand	
LNGU130812PNEL-R	●			G	Strong cutting edge, RE1:1.2	Left-hand	
LNGU130816PNER-R	★			G	Strong cutting edge, RE1 1.6	Right-hand	
LNGU130816PNEL-R	★			G	Strong cutting edge, RE1 1.6	Left-hand	
LNGU130820PNER-R	★			G	Strong cutting edge, RE1 2.0	Right-hand	
LNGU130820PNEL-R	★			G	Strong cutting edge, RE1 2.0	Left-hand	
LNGU130824PNER-R	★			G	Strong cutting edge, RE1 2.4	Right-hand	
LNGU130824PNEL-R	★			G	Strong cutting edge, RE1 2.4	Left-hand	
LNGU130830PNER-R	★			G	Strong cutting edge, RE1 3.0	Right-hand	
LNGU130830PNEL-R	●			G	Strong cutting edge, RE1 3.0	Left-hand	
LNGU130840PNER-R	★			G	Strong cutting edge, RE1 4.0	Right-hand	
LNGU130840PNEL-R	★			G	Strong cutting edge, RE1 4.0	Left-hand	
LNGU130850PNER-R	★			G	Strong cutting edge, RE1 5.0	Right-hand	
LNGU130850PNEL-R	★			G	Strong cutting edge, RE1 5.0	Left-hand	

(10 inserts in one case.)

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● : Inventory maintained. ★ : Inventory maintained in Japan.

MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Multi-Functional milling							
JOMW06T215ZZSR-FT	●	●	●	M	IC 6.35	1st recommendation	AJX
JOMW080320ZZSR-FT	●	●	●	M	IC 8	1st recommendation	
JDMW09T320ZDSR-FT	●	●	●	M	IC 9.525	1st recommendation	
JDMW120420ZDSR-FT	●	●	●	M	IC 12	1st recommendation	
JDMW140520ZDSR-FT	●	●	●	M	IC 14	1st recommendation	
JDMT120420ZDSR-ST	●	●		M	IC 12, Strong cutting edge	Interrupted cutting	
JDMT140520ZDSR-ST	★	●		M	IC 14, Strong cutting edge	Interrupted cutting	
JOMT06T216ZZER-JL	●	●	●	M	IC 6.35	Difficult-to-cut materials	
JOMT080322ZZER-JL	●	●	●	M	IC 8	Difficult-to-cut materials	
JDMT09T323ZDER-JL	●	●	●	M	IC 9.525	Difficult-to-cut materials	
JDMT120423ZDER-JL	●	●	●	M	IC 12	Difficult-to-cut materials	
JDMT140523ZDER-JL	●	●	●	M	IC 14	Difficult-to-cut materials	
JOMT06T215ZZSR-JM	●	●	●	M	IC 6.35, Low resistance	General cutting	
JOMT080320ZZSR-JM	●	●	●	M	IC 8, Low resistance	General cutting	
JDMT09T320ZDSR-JM	●	●	●	M	IC 9.525, Low resistance	General cutting	
JDMT120420ZDSR-JM	●	●	●	M	IC 12, Low resistance	General cutting	
JDMT140520ZDSR-JM	●	●	●	M	IC 14, Low resistance	General cutting	
QOGT0830R-G1	★			G	*APMX 7.4, Low resistance	General cutting	AQX
QOGT1035R-G1	★			G	*APMX 9.2, Low resistance	General cutting	
QOGT1342R-G1	★			G	*APMX 11.5, Low resistance	General cutting	
QOGT1651R-G1	★			G	*APMX 14.5, Low resistance	General cutting	
QOGT1856R-G1	★			G	*APMX 16, Low resistance	General cutting	
QOGT2062R-G1	★			G	*APMX 18, Low resistance	General cutting	
QOGT2576R-G1	★			G	*APMX 23, Low resistance	General cutting	
QOMT0830R-M2	●	●	★	M	*APMX 7.4	General cutting	
QOMT1035R-M2	●	●	●	M	*APMX 9.2	General cutting	
QOMT1342R-M2	●	●	●	M	*APMX 11.5	General cutting	
QOMT1651R-M2	●	●	●	M	*APMX 14.5	General cutting	
QOMT1856R-M2	★	★	★	M	*APMX 16	General cutting	
QOMT2062R-M2	★	★	★	M	*APMX 18	General cutting	
QOMT2576R-M2	★	★	★	M	*APMX 23	General cutting	
RPHT1040M0E4-L	●	●	●	H	IC 10, Low resistance, High precision	Titanium alloys, Stainless steel	ARP
RPMT1040M0E8-L1	●	●	★	M	IC10, General 8 corner	Titanium alloys, Stainless steel	
RPMT1040M0E4-L2	●	●	●	M	IC 10, Low resistance, High rigidity	Titanium alloys, Stainless steel	
RPHT1040M0E4-M	●	●	●	H	IC10, General, High precision	General cutting	
RPMT1040M0E8-M1	●	●	●	M	IC10, General 8 corner	General cutting	
RPMT1040M0E4-M2	●	●	●	M	IC10, General, High rigidity	General cutting	
RPHT1040M0E4-R	★	●	●	H	IC10, Strong cutting edge, High precision	Interrupted cutting	
RPMT1040M0E8-R1	★	●	●	M	IC10, General 8 corner	Interrupted cutting	
RPMT1040M0E4-R2	★	●	●	M	IC10, Strong cutting edge	Interrupted cutting	
RPHT1248M0E4-L	●	●	★	H	IC 12, Low resistance, High precision	Titanium alloys, Stainless steel	
RPMT1248M0E8-L1	●	●	●	M	IC12, General 8 corner	Titanium alloys, Stainless steel	
RPMT1248M0E4-L2	●	●	●	M	IC 12, Low resistance, High rigidity	Titanium alloys, Stainless steel	
RPHT1248M0E4-M	●	●	●	H	IC12, General, High precision	General cutting	
RPMT1248M0E8-M1	●	●	●	M	IC12, General 8 corner	General cutting	
RPMT1248M0E4-M2	●	●	●	M	IC12, General, High rigidity	General cutting	
RPHT1248M0E4-R	★	●	●	H	IC12, Strong cutting edge, High precision	Interrupted cutting	
RPMT1248M0E8-R1	★	●	●	M	IC12, General 8 corner	Interrupted cutting	
RPMT1248M0E4-R2	★	●	●	M	IC12, Strong cutting edge	Interrupted cutting	

(10 inserts in one case.)
* This is the short edge type APMX.

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MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Multi-Functional milling							
XDGX175004PDER-GM	●			G	Strong cutting edge, RE0.4	High speed cutting	**AXD4000 AXD4000A** 
XDGX175008PDER-GM	●			G	Strong cutting edge, RE0.8	High speed cutting	
XDGX175012PDER-GM	●			G	Strong cutting edge, RE1.2	High speed cutting	
XDGX175016PDER-GM	●			G	Strong cutting edge, RE1.6	High speed cutting	
XDGX175020PDER-GM	●			G	Strong cutting edge, RE2.0	High speed cutting	
XDGX175024PDER-GM	●			G	Strong cutting edge, RE2.4	High speed cutting	
XDGX175030PDER-GM	●			G	Strong cutting edge, RE3.0	High speed cutting	
XDGX175032PDER-GM	●			G	Strong cutting edge, RE3.2	High speed cutting	
XDGX175040PDER-GM	★			G	Strong cutting edge, RE4.0	High speed cutting	
XDGX175050PDER-GM	●			G	Strong cutting edge, RE5.0	High speed cutting	
XDGX227008PDER-GLA	★			G	Low resistance, RE0.8	Dimensions after machining will be RE	**AXD7000** 
XDGX227016PDER-GLA	★			G	Low resistance, RE1.6	Dimensions after machining will be RE	
RPMT08T2M0E-JS	●			M	IC 8, Low resistance	High feed cutting	**BRP** 
RPMT10T3M0E-JS	★			M	IC 10, Low resistance	High feed cutting	
RPMT1204M0E-JS	★			M	IC 12, Low resistance	High feed cutting	
RPMT1606M0E-JS	●			M	IC 16, Low resistance	High feed cutting	
RPMW10T3M0E	★			M	IC 10	General cutting	
RPMW1204M0E	●			M	IC 12	General cutting	
RPMW1606M0E	●			M	IC 16	General cutting	
XDGT1550PDER-G04	★	★		G	RE0.4	General cutting	**BXD4000** 
XDGT1550PDER-G08	★	★		G	RE0.8	General cutting	
XDGT1550PDER-G12	★	★		G	RE1.2	General cutting	
XDGT1550PDER-G16	★	★		G	RE1.6	General cutting	
XDGT1550PDER-G20	★	★		G	RE2.0	General cutting	
XDGT1550PDER-G30	★	★		G	RE3.0	General cutting	
XDGT1550PDER-G32	★	★		G	RE3.2	General cutting	
XDGT1550PDER-G40	★	★		G	RE4.0	General cutting	
XDGT1550PDER-G50	★	★		G	RE5.0	General cutting	
LOGU0904020PNER-L	●	●	●	G	Low resistance, RE0.2	Stable – General cutting	**VPX200** 
LOGU0904040PNER-L	●	●	●	G	Low resistance, RE0.4	Stable – General cutting	
LOGU0904080PNER-L	●	●	●	G	Low resistance, RE0.8	Stable – General cutting	
LOGU0904100PNER-L	●	●	★	G	Low resistance, RE1.0	Stable – General cutting	
LOGU0904120PNER-L	★	★	★	G	Low resistance, RE1.2	Stable – General cutting	
LOGU0904160PNER-L	●	●	●	G	Low resistance, RE1.6	Stable – General cutting	
LOGU0904020PNER-M	●	●	●	G	RE0.2	General – Unstable cutting	
LOGU0904040PNER-M	●	●	●	G	RE0.4	General – Unstable cutting	
LOGU0904080PNER-M	●	●	●	G	RE0.8	General – Unstable cutting	
LOGU0904100PNER-M	●	●	●	G	RE1.0	General – Unstable cutting	
LOGU0904120PNER-M	●	●	●	G	RE1.2	General – Unstable cutting	
LOGU0904160PNER-M	●	●	●	G	RE1.6	General – Unstable cutting	

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(10 inserts in one case.)

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MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Multi-Functional milling							
LOGU1207020PNER-L	★	★	★	G	Low resistance, RE0.2	Stable – General cutting	**VPX300** 
LOGU1207040PNER-L	●	●	★	G	Low resistance, RE0.4	Stable – General cutting	
LOGU1207080PNER-L	●	●	●	G	Low resistance, RE0.8	Stable – General cutting	
LOGU1207100PNER-L	★	★	★	G	Low resistance, RE1.0	Stable – General cutting	
LOGU1207120PNER-L	★	●	★	G	Low resistance, RE1.2	Stable – General cutting	
LOGU1207160PNER-L	★	★	★	G	Low resistance, RE1.6	Stable – General cutting	
LOGU1207200PNER-L	★	●	●	G	Low resistance, RE2.0	Stable – General cutting	
LOGU1207240PNER-L	★	★	★	G	Low resistance, RE2.4	Stable – General cutting	
LOGU1207300PNER-L	★	★	★	G	Low resistance, RE3.0	Stable – General cutting	
LOGU1207320PNER-L	★	★	★	G	Low resistance, RE3.2	Stable – General cutting	
LOGU1207020PNER-M	●	●	★	G	RE0.2	General – Unstable cutting	
LOGU1207040PNER-M	●	●	●	G	RE0.4	General – Unstable cutting	
LOGU1207080PNER-M	●	●	●	G	RE0.8	General – Unstable cutting	
LOGU1207100PNER-M	●	●	●	G	RE1.0	General – Unstable cutting	
LOGU1207120PNER-M	●	●	●	G	RE1.2	General – Unstable cutting	
LOGU1207160PNER-M	★	●	●	G	RE1.6	General – Unstable cutting	
LOGU1207200PNER-M	●	●	●	G	RE2.0	General – Unstable cutting	
LOGU1207240PNER-M	●	●	★	G	RE2.4	General – Unstable cutting	
LOGU1207300PNER-M	●	●	★	G	RE3.0	General – Unstable cutting	
LOGU1207320PNER-M	●	●	●	G	RE3.2	General – Unstable cutting	
JOMU090512ZZER-L	●	●	●	M	Low resistance	Stable cutting, Titanium alloys	**WJX09** 
JOMU090512ZZER-M	●	●	●	M	General	General cutting	
JOMU090512ZZER-R	●	●	●	M	Strong cutting edge	Unstable cutting	
JOMU140715ZZER-L	●	●	●	M	Low resistance	Stable cutting, Titanium alloys	**WJX14** 
JOMU140715ZZER-M	●	●	●	M	General	General cutting	
JOMU140715ZZER-R	●	●	●	M	Strong cutting edge	Unstable cutting	

(10 inserts in one case.)

94 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Deep Shoulder milling							
JPMX140412-JM	★	★		M	Straight cutting edge	Bottom cutting edge	SPX 
JPMX190412-JM	●	★		M	Straight cutting edge	Bottom cutting edge	
JPMX140412-WH	★	★		M	Wavy cutting edge	Bottom cutting edge	
JPMX190412-WH	★	★		M	Wavy cutting edge	Bottom cutting edge	
SPMX120408-JM	★	★		M	Straight cutting edge	Peripheral cutting edge	SPX 
SPMX120408-WH	★	★		M	Wavy cutting edge	Peripheral cutting edge	

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(10 inserts in one case.)

102 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Copying							
SRG16C	★			G	Reinforced edge, CEMR 8	Inner	**SRM2**
SRG16E	★			G	Reinforced edge, CEMR 8	Outer	
SRG20C	●			G	Reinforced edge, CEMR 10	Inner	
SRG20E	●			G	Reinforced edge, CEMR 10	Outer	
SRG25C	★			G	Reinforced edge, CEMR 12.5	Inner	
SRG25E	★			G	Reinforced edge, CEMR 12.5	Outer	
SRG30C	★			G	Reinforced edge, CEMR 15	Inner	
SRG30E	★			G	Reinforced edge, CEMR 15	Outer	
SRG32C	★			G	Reinforced edge, CEMR 16	Inner	
SRG32E	★			G	Reinforced edge, CEMR 16	Outer	
SRM16C-M	●			M	Low resistance, CEMR 8	Inner	**SRM2**
SRM16E-M	●			M	Low resistance, CEMR 8	Outer	
SRM20C-M	★			M	Low resistance, CEMR 10	Inner	
SRM20E-M	★			M	Low resistance, CEMR 10	Outer	
SRM25C-M	★			M	Low resistance, CEMR 12.5	Inner	
SRM25E-M	★			M	Low resistance, CEMR 12.5	Outer	
SRM30C-M	★			M	Low resistance, CEMR 15	Inner	
SRM30E-M	★			M	Low resistance, CEMR 15	Outer	
SRM32C-M	●			M	Low resistance, CEMR 16	Inner	
SRM32E-M	●			M	Low resistance, CEMR 16	Outer	
							1/1

(10 inserts in one case.)

107 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

MP1200 SERIES – INSERTS

Order number	MP1220	MP1230	MP1240	Class	Specifications	Note	Geometry
Spot milling							
JPMT060204-E	●			M	Parallelogram	General cutting	**CBJP** 
MPMT090308	★			M	Rhombic geometry	General cutting	**CBMP** 
Vertical feed milling							
TPEW1303ZPER2	★			E	IC 7.94	General cutting	**PMF** 
CPMT1205ZPEN-M2	★			M	IC 12.7	General cutting	**PMR**
CPMT1205ZPEN-M3	★			M	IC 12.7	General cutting	

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(10 inserts in one case.)

108 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

FACE MILLING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	WSX445							
P	Mild steel	≤180HB	Dry	● ◐ ✣	—	250 (200 – 300)	240 (190 – 290)	—
			Wet	● ◐ ✣	—	150 (100 – 200)	150 (100 – 200)	—
	Carbon steel Alloy steel	180 – 350HB	Dry	● ◐ ✣	—	220 (170 – 270)	200 (150 – 250)	—
			Wet	● ◐ ✣	—	120 (80 – 160)	120 (80 – 160)	—
	Alloy tool steel	≤350HB Annealing	Dry	● ◐ ✣	—	220 (170 – 270)	200 (150 – 250)	—
			Wet	● ◐ ✣	—	120 (80 – 160)	120 (80 – 160)	—
	Pre-hardened steel	35 – 45HRC	Dry	● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
			Wet	● ◐ ✣	—	100 (80 – 120)	100 (80 – 120)	—
M	Austenitic stainless steel	≤200HB	Dry	● ◐ ✣	—	—	200 (150 – 250)	200 (150 – 250)
			Wet	● ◐ ✣	—	—	130 (80 – 180)	130 (80 – 180)
		>200HB	Dry	● ◐ ✣	—	—	170 (120 – 220)	170 (120 – 220)
			Wet	● ◐ ✣	—	—	100 (80 – 150)	100 (80 – 150)
	Duplex stainless steel	≤280HB	Dry	● ◐ ✣	—	—	160 (110 – 210)	160 (110 – 210)
			Wet	● ◐ ✣	—	—	100 (80 – 150)	100 (80 – 150)
	Precipitation hardening stainless steel	<450HB	Dry	● ◐ ✣	—	—	150 (100 – 200)	150 (100 – 200)
			Wet	● ◐ ✣	—	—	90 (50 – 140)	90 (50 – 140)
S	Titanium alloys	–	Wet	● ◐ ✣	—	50 (40 – 60)	50 (40 – 60)	50 (40 – 60)
	Heat resistant alloys	–	Wet	● ◐ ✣	—	40 (20 – 50)	40 (20 – 50)	40 (20 – 50)
	ASX445							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	250 (200 – 300)	240 (190 – 290)	—
	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	220 (170 – 270)	200 (150 – 230)	—
		280 – 350HB		● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐ ✣	—	—	220 (170 – 270)	200 (150 – 250)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (40 – 60)	45 (30 – 55)	45 (30 – 55)
	Heat resistant alloys	—	Wet	● ◐ ✣	—	40 (20 – 50)	35 (15 – 45)	35 (15 – 45)
	AHX440S							
P	Mild steel	≤180HB	Dry	● ◐ ✣	—	250 (200 – 300)	240 (190 – 290)	—
	Carbon steel Alloy steel	180 – 280HB	Dry	● ◐ ✣	—	220 (170 – 270)	200 (150 – 250)	—
		280 – 350HB		● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
	Alloy tool steel	≤350HB Annealing	Dry	● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
	Pre-hardened steel	35 – 45HRC	Dry	● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
M	Austenitic stainless steel	≤200HB	Dry	● ◐ ✣	—	—	200 (150 – 250)	180 (120 – 230)
		>200HB		● ◐ ✣	—	—	150 (100 – 200)	130 (80 – 180)
	Ferritic and martensitic stainless steel	≤200HB	Dry	● ◐ ✣	—	200 (150 – 250)	200 (150 – 250)	180 (120 – 230)
		>200HB		● ◐ ✣	—	150 (100 – 200)	150 (100 – 200)	130 (80 – 180)
	Duplex stainless steel	≤280HB	Dry	● ◐ ✣	—	—	140 (100 – 180)	120 (80 – 160)
	Precipitation hardening stainless steel	<450HB	Dry	● ◐ ✣	—	—	130 (100 – 160)	110 (80 – 140)
	Austenitic stainless steel	≤200HB	Wet	● ◐ ✣	—	—	125 (100 – 150)	100 (80 – 140)
		>200HB		● ◐ ✣	—	—	100 (75 – 125)	80 (55 – 105)
	Ferritic and martensitic stainless steel	≤200HB	Wet	● ◐ ✣	—	125 (100 – 150)	125 (100 – 150)	100 (80 – 140)
		>200HB		● ◐ ✣	—	100 (75 – 125)	100 (75 – 125)	80 (55 – 105)
	Duplex stainless steel	≤280HB	Wet	● ◐ ✣	—	—	80 (60 – 100)	60 (40 – 80)
	Precipitation hardening stainless steel	<450HB	Wet	● ◐ ✣	—	—	70 (50 – 90)	50 (30 – 70)
P	Mild steel	≤180HB	Wiper	● ◐	—	250 (200 – 300)	—	—
	Carbon steel Alloy steel	180 – 280HB	Wiper	● ◐	—	220 (170 – 270)	—	—
		280 – 350HB		● ◐	—	140 (100 – 180)	—	—
	Alloy tool steel	≤350HB Annealing	Wiper	● ◐	—	140 (100 – 180)	—	—
	Pre-hardened steel	35 – 45HRC	Wiper	● ◐	—	140 (100 – 180)	—	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

FACE MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	AHX475S							
P	Mild steel	≤180HB	Dry	● ◐ ✣	—	150 (100 – 200)	130 (80 – 180)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry	● ◐ ✣	—	130 (80 – 180)	110 (60 – 160)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry	● ◐ ✣	—	100 (50 – 150)	80 (30 – 120)	—
P	Alloy tool steel	≤350HB Annealing	Dry	● ◐ ✣	—	100 (50 – 150)	80 (30 – 120)	—
P	Pre-hardened steel	35 – 45HRC	Dry	● ◐ ✣	—	100 (70 – 130)	80 (50 – 110)	—
	AHX640S							
P	Mild steel	≤180HB	Dry	● ◐ ✣	—	250 (200 – 300)	220 (170 – 270)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry	● ◐ ✣	—	220 (170 – 270)	190 (140 – 240)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry	● ◐ ✣	—	140 (100 – 180)	110 (70 – 150)	—
P	Alloy tool steel	≤350HB Annealing	Dry	● ◐ ✣	—	140 (100 – 180)	110 (70 – 150)	—
P	Pre-hardened steel	35 – 45HRC	Dry	● ◐ ✣	—	140 (100 – 180)	110 (70 – 150)	—
S	Titanium alloys	—	Wet	● ◐ ✣	—	60 (50 – 70)	40 (20 – 50)	40 (20 – 50)
S	Heat resistant alloys	—	Wet	● ◐ ✣	—	60 (50 – 70)	40 (20 – 50)	40 (20 – 50)
P	Mild steel	≤180HB	Wiper	●	—	250 (200 – 300)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Wiper	●	—	220 (170 – 270)	—	—
P	Carbon steel Alloy steel	280 – 350HB	Wiper	●	—	140 (100 – 180)	—	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX200								
P	Mild steel	≤180HB	Dry	●	0.5DC≥	240 (200 – 280)	—	—
				●	0.8DC≥	220 (180 – 260)	—	—
				●	DC	200 (160 – 240)	—	—
				◐	0.5DC≥	—	230 (190 – 270)	—
				◐	0.8DC≥	—	210 (170 – 250)	—
				◐	DC	—	190 (150 – 230)	—
				✣	0.5DC≥	—	210 (170 – 250)	—
				✣	0.8DC≥	—	190 (150 – 230)	—
				✣	DC	—	170 (130 – 210)	—
	Carbon steel Alloy steel	180 – 280HB	Dry	●	0.5DC≥	210 (170 – 250)	—	—
				●	0.8DC≥	190 (150 – 230)	—	—
				●	DC	170 (130 – 210)	—	—
				◐	0.5DC≥	—	200 (160 – 240)	—
				◐	0.8DC≥	—	180 (140 – 220)	—
				◐	DC	—	160 (120 – 200)	—
				✣	0.5DC≥	—	180 (140 – 220)	—
				✣	0.8DC≥	—	160 (120 – 200)	—
				✣	DC	—	140 (100 – 180)	—
		280 – 350HB		●	0.5DC≥	200 (160 – 240)	—	—
				●	0.8DC≥	180 (140 – 220)	—	—
				●	DC	170 (130 – 210)	—	—
				◐	0.5DC≥	—	190 (150 – 230)	—
				◐	0.8DC≥	—	170 (130 – 210)	—
				◐	DC	—	150 (110 – 190)	—
				✣	0.5DC≥	—	170 (130 – 210)	—
				✣	0.8DC≥	—	150 (110 – 190)	—
				✣	DC	—	130 (90 – 170)	—
	Alloy tool steel	≤350HB Annealing	Dry	●	0.5DC≥	200 (160 – 240)	—	—
				●	0.8DC≥	180 (140 – 220)	—	—
				●	DC	170 (130 – 210)	—	—
				◐	0.5DC≥	—	190 (150 – 230)	—
				◐	0.8DC≥	—	170 (130 – 210)	—
				◐	DC	—	150 (110 – 190)	—
				✣	0.5DC≥	—	170 (130 – 210)	—
				✣	0.8DC≥	—	150 (110 – 190)	—
				✣	DC	—	130 (90 – 170)	—
	Pre-hardened steel	35 – 45HRC	Dry	●	0.5DC≥	140 (120 – 160)	—	—
				◐	0.5DC≥	—	120 (100 – 140)	—
				✣	0.5DC≥	—	110 (90 – 130)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX200								
M	Austenitic stainless steel	≤200HB	Dry	●	0.5DC≥	—	180 (160 – 200)	—
				●	0.8DC≥	—	160 (140 – 180)	—
				◐	0.5DC≥	—	170 (150 – 190)	—
				◐	0.8DC≥	—	150 (130 – 170)	—
				✣	0.5DC≥	—	—	150 (130 – 170)
				✣	0.8DC≥	—	—	130 (110 – 150)
		>200HB		●	0.5DC≥	—	170 (150 – 190)	—
				●	0.8DC≥	—	150 (130 – 170)	—
				◐	0.5DC≥	—	160 (140 – 180)	—
				◐	0.8DC≥	—	140 (120 – 160)	—
				✣	0.5DC≥	—	—	140 (120 – 160)
				✣	0.8DC≥	—	—	120 (100 – 140)
	Ferritic and martensitic stainless steel	≤200HB	Dry	●	0.5DC≥	180 (160 – 200)	180 (160 – 200)	—
				●	0.8DC≥	160 (140 – 180)	160 (140 – 180)	—
				◐	0.5DC≥	—	170 (150 – 190)	—
				◐	0.8DC≥	—	150 (130 – 170)	—
				✣	0.5DC≥	—	—	150 (130 – 170)
				✣	0.8DC≥	—	—	130 (110 – 150)
	Duplex stainless steel	≤280HB	Dry	●	0.5DC≥	—	160 (140 – 180)	—
				●	0.8DC≥	—	140 (120 – 160)	—
				◐	0.5DC≥	—	150 (130 – 170)	—
				◐	0.8DC≥	—	130 (110 – 150)	—
				✣	0.5DC≥	—	—	130 (110 – 150)
				✣	0.8DC≥	—	—	110 (90 – 130)
	Precipitation hardening stainless steel	<450HB	Dry	●	0.5DC≥	—	140 (120 – 160)	—
				◐	0.5DC≥	—	130 (110 – 150)	—
				✣	0.5DC≥	—	—	110 (90 – 130)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX200								
P	Mild steel	≤180HB	Wet	●	0.5DC≥	150 (140 – 160)	—	—
				●	0.8DC≥	130 (120 – 140)	—	—
				●	DC	120 (110 – 130)	—	—
				◐	0.5DC≥	—	140 (130 – 150)	—
				◐	0.8DC≥	—	120 (110 – 130)	—
				◐	DC	—	110 (100 – 120)	—
				✣	0.5DC≥	—	120 (110 – 130)	—
				✣	0.8DC≥	—	100 (90 – 110)	—
				✣	DC	—	90 (80 – 100)	—
	Carbon steel Alloy steel	180 – 280HB	Wet	●	0.5DC≥	150 (140 – 160)	—	—
				●	0.8DC≥	130 (120 – 140)	—	—
				●	DC	120 (110 – 130)	—	—
				◐	0.5DC≥	—	140 (130 – 150)	—
				◐	0.8DC≥	—	120 (110 – 130)	—
				◐	DC	—	110 (100 – 120)	—
				✣	0.5DC≥	—	120 (110 – 130)	—
				✣	0.8DC≥	—	90 (80 – 100)	—
				✣	DC	—	80 (70 – 90)	—
		280 – 350HB		●	0.5DC≥	140 (130 – 150)	—	—
				●	0.8DC≥	120 (110 – 130)	—	—
				●	DC	110 (100 – 120)	—	—
				◐	0.5DC≥	—	130 (120 – 140)	—
				◐	0.8DC≥	—	110 (100 – 120)	—
				◐	DC	—	100 (90 – 110)	—
				✣	0.5DC≥	—	110 (100 – 120)	—
				✣	0.8DC≥	—	90 (80 – 100)	—
				✣	DC	—	80 (70 – 90)	—
	Alloy tool steel	≤350HB Annealing	Wet	●	0.5DC≥	140 (130 – 150)	—	—
				●	0.8DC≥	120 (110 – 130)	—	—
				●	DC	110 (100 – 120)	—	—
				◐	0.5DC≥	—	130 (120 – 140)	—
				◐	0.8DC≥	—	110 (100 – 120)	—
				◐	DC	—	100 (90 – 110)	—
				✣	0.5DC≥	—	110 (100 – 120)	—
				✣	0.8DC≥	—	90 (80 – 100)	—
				✣	DC	—	80 (70 – 90)	—
	Pre-hardened steel	35 – 45HRC	Wet	●	0.5DC≥	110 (100 – 120)	—	—
				◐	0.5DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	80 (70 – 90)	—

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Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX200								
M	Austenitic stainless steel	≤200HB	Wet	●	0.5DC≥	—	130 (120 – 140)	—
				●	0.8DC≥	—	110 (100 – 120)	—
				◐	0.5DC≥	—	120 (110 – 130)	—
				◐	0.8DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	—	100 (90 – 110)
				✣	0.8DC≥	—	—	80 (70 – 90)
		>200HB		●	0.5DC≥	—	130 (120 – 140)	—
				●	0.8DC≥	—	110 (100 – 120)	—
				◐	0.5DC≥	—	120 (110 – 130)	—
				◐	0.8DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	—	100 (90 – 110)
				✣	0.8DC≥	—	—	80 (70 – 90)
	Ferritic and martensitic stainless steel	≤200HB	Wet	●	0.5DC≥	130 (120 – 140)	130 (120 – 140)	—
				●	0.8DC≥	110 (100 – 120)	110 (100 – 120)	—
				◐	0.5DC≥	—	120 (110 – 130)	—
				◐	0.8DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	—	100 (90 – 110)
				✣	0.8DC≥	—	—	80 (70 – 90)
	Duplex stainless steel	≤280HB	Wet	●	0.5DC≥	—	120 (110 – 130)	—
				●	0.8DC≥	—	100 (90 – 110)	—
				◐	0.5DC≥	—	110 (100 – 120)	—
				◐	0.8DC≥	—	90 (80 – 100)	—
				✣	0.5DC≥	—	—	90 (80 – 100)
				✣	0.8DC≥	—	—	70 (60 – 80)
	Precipitation hardening stainless steel	<450HB	Wet	●	0.5DC≥	—	120 (110 – 130)	—
				◐	0.5DC≥	—	110 (100 – 120)	—
				✣	0.5DC≥	—	—	90 (80 – 100)
S	Titanium alloys	—	Wet	●	0.5DC≥	80 (60 – 100)	—	—
				◐	0.5DC≥	—	70 (50 – 90)	—
				✣	0.5DC≥	—	—	60 (40 – 80)
	Heat resistant alloys	—	Wet	●	0.5DC≥	60 (50 – 70)	—	—
				◐	0.5DC≥	—	50 (30 – 60)	—
				✣	0.5DC≥	—	—	40 (20 – 40)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX400								
P	Mild steel	≤180HB	Dry	●	0.5DC≥	240 (200 – 280)	—	—
				●	0.8DC≥	220 (180 – 260)	—	—
				●	DC	200 (160 – 240)	—	—
				◕	0.5DC≥	—	230 (190 – 270)	—
				◕	0.8DC≥	—	210 (170 – 250)	—
				◕	DC	—	190 (150 – 230)	—
				✣	0.5DC≥	—	210 (170 – 250)	—
				✣	0.8DC≥	—	190 (150 – 230)	—
				✣	DC	—	170 (130 – 210)	—
	Carbon steel Alloy steel	180 – 280HB	Dry	●	0.5DC≥	210 (170 – 250)	—	—
				●	0.8DC≥	190 (150 – 230)	—	—
				●	DC	170 (130 – 210)	—	—
				◕	0.5DC≥	—	200 (160 – 240)	—
				◕	0.8DC≥	—	180 (140 – 220)	—
				◕	DC	—	160 (120 – 200)	—
				✣	0.5DC≥	—	180 (140 – 220)	—
				✣	0.8DC≥	—	160 (120 – 200)	—
				✣	DC	—	140 (100 – 180)	—
		———		●	0.5DC≥	200 (160 – 240)	—	—
				●	0.8DC≥	180 (140 – 220)	—	—
				●	DC	160 (120 – 200)	—	—
		280 – 350HB		◕	0.5DC≥	—	190 (150 – 230)	—
				◕	0.8DC≥	—	170 (130 – 210)	—
				◕	DC	—	150 (110 – 190)	—
				✣	0.5DC≥	—	170 (130 – 210)	—
				✣	0.8DC≥	—	150 (110 – 190)	—
				✣	DC	—	130 (90 – 170)	—
	Alloy tool steel	≤350HB Annealing	Dry	●	0.5DC≥	200 (160 – 240)	—	—
				●	0.8DC≥	180 (140 – 220)	—	—
				●	DC	160 (120 – 200)	—	—
				◕	0.5DC≥	—	190 (150 – 230)	—
				◕	0.8DC≥	—	170 (130 – 210)	—
				◕	DC	—	150 (110 – 190)	—
				✣	0.5DC≥	—	170 (130 – 210)	—
				✣	0.8DC≥	—	150 (110 – 190)	—
				✣	DC	—	130 (90 – 170)	—
	Pre-hardened steel	35 – 45HRC	Dry	●	0.5DC≥	140 (120 – 160)	—	—
				◕	0.5DC≥	—	120 (100 – 140)	—
				✣	0.5DC≥	—	110 (90 – 130)	—

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Cutting conditions : ● : Stable cutting ◕ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX400								
M	Austenitic stainless steel	≤200HB	Dry	●	0.5DC≥	—	180 (160 – 200)	—
				●	0.8DC≥	—	160 (140 – 180)	—
				◐	0.5DC≥	—	170 (150 – 190)	—
				◐	0.8DC≥	—	150 (130 – 170)	—
				✣	0.5DC≥	—	—	150 (130 – 170)
				✣	0.8DC≥	—	—	130 (110 – 150)
		>200HB		●	0.5DC≥	—	170 (150 – 190)	—
				●	0.8DC≥	—	150 (130 – 170)	—
				◐	0.5DC≥	—	160 (140 – 180)	—
				◐	0.8DC≥	—	140 (120 – 160)	—
				✣	0.5DC≥	—	—	140 (120 – 160)
				✣	0.8DC≥	—	—	120 (100 – 140)
	Ferritic and martensitic stainless steel	≤200HB	Dry	●	0.5DC≥	180 (160 – 200)	180 (160 – 200)	—
				●	0.8DC≥	160 (140 – 180)	160 (140 – 180)	—
				◐	0.5DC≥	—	170 (150 – 190)	—
				◐	0.8DC≥	—	150 (130 – 170)	—
				✣	0.5DC≥	—	—	150 (130 – 170)
				✣	0.8DC≥	—	—	130 (110 – 150)
	Duplex stainless steel	≤280HB	Dry	●	0.5DC≥	—	160 (140 – 180)	—
				●	0.8DC≥	—	140 (120 – 160)	—
				◐	0.5DC≥	—	150 (130 – 170)	—
				◐	0.8DC≥	—	130 (110 – 150)	—
				✣	0.5DC≥	—	—	130 (110 – 150)
				✣	0.8DC≥	—	—	110 (90 – 130)
	Precipitation hardening stainless steel	<450HB	Dry	●	0.5DC≥	—	140 (120 – 160)	—
				◐	0.5DC≥	—	130 (110 – 150)	—
				✣	0.5DC≥	—	—	110 (90 – 130)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX400								
P	Mild steel	≤180HB	Wet	●	0.5DC≥	150 (140 – 160)	—	—
				●	0.8DC≥	130 (120 – 140)	—	—
				●	DC	120 (110 – 130)	—	—
				◔	0.5DC≥	—	140 (130 – 150)	—
				◔	0.8DC≥	—	120 (110 – 130)	—
				◔	DC	—	110 (100 – 120)	—
				✣	0.5DC≥	—	120 (110 – 130)	—
				✣	0.8DC≥	—	100 (90 – 110)	—
				✣	DC	—	90 (80 – 100)	—
	Carbon steel Alloy steel	180 – 280HB	Wet	●	0.5DC≥	150 (140 – 160)	—	—
				●	0.8DC≥	130 (120 – 140)	—	—
				●	DC	120 (110 – 130)	—	—
				◔	0.5DC≥	—	140 (130 – 150)	—
				◔	0.8DC≥	—	120 (110 – 130)	—
				◔	DC	—	110 (100 – 120)	—
				✣	0.5DC≥	—	120 (110 – 130)	—
				✣	0.8DC≥	—	100 (90 – 110)	—
				✣	DC	—	90 (80 – 100)	—
		280 – 350HB		●	0.5DC≥	140 (130 – 150)	—	—
				●	0.8DC≥	120 (110 – 130)	—	—
				●	DC	110 (100 – 120)	—	—
				◔	0.5DC≥	—	130 (120 – 140)	—
				◔	0.8DC≥	—	110 (100 – 120)	—
				◔	DC	—	100 (90 – 110)	—
				✣	0.5DC≥	—	110 (100 – 120)	—
				✣	0.8DC≥	—	90 (80 – 100)	—
				✣	DC	—	80 (70 – 90)	—
	Alloy tool steel	≤350HB Annealing	Wet	●	0.5DC≥	140 (130 – 150)	—	—
				●	0.8DC≥	120 (110 – 130)	—	—
				●	DC	110 (100 – 120)	—	—
				◔	0.5DC≥	—	130 (120 – 140)	—
				◔	0.8DC≥	—	110 (100 – 120)	—
				◔	DC	—	100 (90 – 110)	—
				✣	0.5DC≥	—	110 (100 – 120)	—
				✣	0.8DC≥	—	90 (80 – 100)	—
				✣	DC	—	80 (70 – 90)	—
	Pre-hardened steel	35 – 45HRC	Wet	●	0.5DC≥	110 (100 – 120)	—	—
				◔	0.5DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	80 (70 – 90)	—

Cutting conditions : ● : Stable cutting ◔ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
WWX400								
M	Austenitic stainless steel	≤200HB	Wet	●	0.5DC≥	—	130 (120 – 140)	—
				●	0.8DC≥	—	110 (100 – 120)	—
				◐	0.5DC≥	—	120 (110 – 130)	—
				◐	0.8DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	—	100 (90 – 110)
				✣	0.8DC≥	—	—	80 (70 – 90)
		>200HB		●	0.5DC≥	—	130 (120 – 140)	—
				●	0.8DC≥	—	110 (100 – 120)	—
				◐	0.5DC≥	—	120 (110 – 130)	—
				◐	0.8DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	—	100 (90 – 110)
				✣	0.8DC≥	—	—	80 (70 – 90)
	Ferritic and martensitic stainless steel	≤200HB	Wet	●	0.5DC≥	130 (120 – 140)	130 (120 – 140)	—
				●	0.8DC≥	110 (100 – 120)	110 (100 – 120)	—
				◐	0.5DC≥	—	120 (110 – 130)	—
				◐	0.8DC≥	—	100 (90 – 110)	—
				✣	0.5DC≥	—	—	100 (90 – 110)
				✣	0.8DC≥	—	—	80 (70 – 90)
	Duplex stainless steel	≤280HB	Wet	●	0.5DC≥	—	120 (110 – 130)	—
				●	0.8DC≥	—	100 (90 – 110)	—
				◐	0.5DC≥	—	110 (100 – 120)	—
				◐	0.8DC≥	—	90 (80 – 100)	—
				✣	0.5DC≥	—	—	90 (80 – 100)
				✣	0.8DC≥	—	—	70 (60 – 80)
	Precipitation hardening stainless steel	<450HB	Wet	●	0.5DC≥	—	120 (110 – 130)	—
				◐	0.5DC≥	—	110 (100 – 120)	—
				✣	0.5DC≥	—	—	90 (80 – 100)
S	Titanium alloys	—	Wet	●	0.5DC≥	80 (60 – 100)	—	—
				◐	0.5DC≥	—	70 (50 – 90)	—
				✣	0.5DC≥	—	—	60 (40 – 80)
	Heat resistant alloys	—	Wet	●	0.5DC≥	60 (50 – 70)	—	—
				◐	0.5DC≥	—	50 (30 – 60)	—
				✣	0.5DC≥	—	—	40 (20 – 40)
VOX400								
K	Gray cast iron	≤200MPa	Dry, Wet	● ◐	—	250 (200 – 300)	—	—
		≤350MPa		● ◐	—	200 (150 – 300)	—	—
	Ductile cast iron	≤450MPa	Dry, Wet	● ◐	—	170 (150 – 200)	—	—
		≤800MPa		● ◐	—	150 (100 – 200)	—	—

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Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	ASX300							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	250 (200 – 300)	240 (190 – 290)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	220 (170 – 270)	180 (150 – 230)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
M	Stainless steel	—	Dry, Wet	● ◐ ✣	—	—	220 (170 – 270)	200 (150 – 250)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (40 – 60)	45 (30 – 55)	45 (30 – 55)
S	Heat resistant alloys	—	Wet	● ◐ ✣	—	40 (20 – 50)	30 (15 – 45)	30 (15 – 45)
	ASX400							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	250 (200 – 300)	240 (190 – 290)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	220 (170 – 270)	180 (150 – 230)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐ ✣	—	140 (100 – 180)	120 (90 – 150)	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐ ✣	—	—	220 (170 – 270)	200 (150 – 250)
S	Titanium alloys	—	Wet	●	—	50 (40 – 60)	—	—
S	Titanium alloys	—	Wet	◐ ✣	—	—	45 (30 – 55)	45 (30 – 55)
S	Heat resistant alloys	—	Wet	●	—	40 (20 – 50)	—	—
S	Heat resistant alloys	—	Wet	◐ ✣	—	—	35 (15 – 45)	35 (15 – 45)

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SIDE CUTTER

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	DCV4							
P	Mild steel	≤180HB	Dry, Shoulder	● ◐	—	150 (130 – 180)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Shoulder	● ◐	—	150 (130 – 180)	—	—
P	Mild steel	≤180HB	Dry, Centre cut	● ◐	—	150 (130 – 180)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Centre cut	● ◐	—	150 (130 – 180)	—	—

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Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX200								
P	Mild steel	≤180HB	Dry	●	≤0.25DC	230 (180 – 270)	—	—
				●	0.25–0.5DC	220 (170 – 260)	—	—
				●	0.5–0.75DC	180 (140 – 210)	—	—
				●	DC	180 (140 – 210)	—	—
				✣	≤0.25DC	—	200 (150 – 240)	—
				✣	0.25–0.5DC	—	190 (140 – 230)	—
				✣	0.5–0.75DC	—	150 (110 – 180)	—
				✣	DC	—	150 (110 – 180)	—
	Carbon steel Alloy steel	180 – 280HB	Dry	●	≤0.25DC	180 (140 – 210)	—	—
				●	0.25–0.5DC	170 (130 – 200)	—	—
				●	0.5–0.75DC	140 (110 – 160)	—	—
				●	DC	140 (110 – 160)	—	—
				✣	≤0.25DC	—	150 (110 – 180)	—
				✣	0.25–0.5DC	—	140 (100 – 170)	—
				✣	0.5–0.75DC	—	110 (80 – 130)	—
				✣	DC	—	110 (80 – 130)	—
		280 – 350HB		●	≤0.25DC	180 (140 – 210)	—	—
				●	0.25–0.5DC	170 (130 – 200)	—	—
				●	0.5–0.75DC	140 (110 – 160)	—	—
				●	DC	140 (110 – 160)	—	—
				✣	≤0.25DC	—	150 (110 – 180)	—
				✣	0.25–0.5DC	—	140 (100 – 170)	—
				✣	0.5–0.75DC	—	110 (80 – 130)	—
				✣	DC	—	110 (80 – 130)	—
	Alloy tool steel	≤350HB Annealing	Dry	●	≤0.25DC	180 (140 – 210)	—	—
				●	0.25–0.5DC	170 (130 – 200)	—	—
				●	0.5–0.75DC	140 (110 – 160)	—	—
				●	DC	140 (110 – 160)	—	—
				✣	≤0.25DC	—	150 (110 – 180)	—
				✣	0.25–0.5DC	—	140 (100 – 170)	—
				✣	0.5–0.75DC	—	110 (80 – 130)	—
				✣	DC	—	110 (80 – 130)	—
	Pre-hardened steel	35 – 45HRC	Dry	●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	100 (80 – 120)	—
				✣	0.25–0.5DC	—	90 (70 – 110)	—
				✣	0.5–0.75DC	—	80 (60 – 100)	—
				✣	DC	—	80 (60 – 100)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX200								
M	Austenitic stainless steel	≤200HB	Dry	● ◐ ✣	≤0.25DC	—	180 (140 – 210)	180 (140 – 210)
				● ◐ ✣	0.25–0.5DC	—	170 (130 – 200)	170 (130 – 200)
				● ◐ ✣	0.5–0.75DC	—	140 (110 – 160)	140 (110 – 160)
				● ◐ ✣	DC	—	140 (110 – 160)	140 (110 – 160)
		>200HB		● ◐ ✣	≤0.25DC	—	150 (110 – 180)	150 (110 – 180)
				● ◐ ✣	0.25–0.5DC	—	140 (100 – 160)	140 (100 – 160)
				● ◐ ✣	0.5–0.75DC	—	110 (80 – 130)	110 (80 – 130)
				● ◐ ✣	DC	—	110 (80 – 130)	110 (80 – 130)
	Ferritic and martensitic stainless steel	≤200HB	Dry	● ◐ ✣	≤0.25DC	180 (140 – 210)	180 (140 – 210)	—
				● ◐ ✣	0.25–0.5DC	170 (130 – 200)	170 (130 – 200)	—
				● ◐ ✣	0.5–0.75DC	140 (110 – 160)	140 (110 – 160)	—
				● ◐ ✣	DC	140 (110 – 160)	140 (110 – 160)	—
	Duplex stainless steel	≤280HB	Dry	● ◐ ✣	≤0.25DC	—	140 (110 – 170)	140 (110 – 170)
				● ◐ ✣	0.25–0.5DC	—	130 (90 – 150)	130 (90 – 150)
				● ◐ ✣	0.5–0.75DC	—	100 (70 – 120)	100 (70 – 120)
				● ◐ ✣	DC	—	100 (70 – 120)	100 (70 – 120)
	Precipitation hardening stainless steel	<450HB	Dry	● ◐ ✣	≤0.25DC	—	130 (100 – 160)	130 (100 – 160)
				● ◐ ✣	0.25–0.5DC	—	120 (80 – 140)	120 (80 – 140)
				● ◐ ✣	0.5–0.75DC	—	90 (60 – 110)	90 (60 – 110)
				● ◐ ✣	DC	—	90 (60 – 110)	90 (60 – 110)
P	Mild steel	≤180HB	Wet	● ◐ ✣	≤0.25DC	140 (100 – 190)	140 (100 – 190)	—
				● ◐ ✣	0.25–0.5DC	130 (90 – 180)	130 (90 – 180)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
	Carbon steel Alloy steel	180 – 280HB	Wet	● ◐ ✣	≤0.25DC	120 (90 – 140)	120 (90 – 140)	—
				● ◐ ✣	0.25–0.5DC	110 (80 – 130)	110 (80 – 130)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
		280 – 350HB		● ◐ ✣	≤0.25DC	120 (90 – 140)	120 (90 – 140)	—
				● ◐ ✣	0.25–0.5DC	110 (80 – 130)	110 (80 – 130)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
	Alloy tool steel	≤350HB Annealing	Wet	● ◐ ✣	≤0.25DC	120 (90 – 140)	120 (90 – 140)	—
				● ◐ ✣	0.25–0.5DC	110 (80 – 130)	110 (80 – 130)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
	Pre-hardened steel	35 – 45HRC	Wet	● ◐ ✣	≤0.25DC	100 (80 – 120)	100 (80 – 120)	—
				● ◐ ✣	0.25–0.5DC	90 (70 – 110)	90 (70 – 110)	—
				● ◐ ✣	0.5–0.75DC	80 (60 – 100)	80 (60 – 100)	—
				● ◐ ✣	DC	80 (60 – 100)	80 (60 – 100)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX200								
M	Austenitic stainless steel	≤200HB	Wet	● ◐ ✣	≤0.25DC	—	120 (100 – 150)	120 (100 – 150)
				● ◐ ✣	0.25–0.5DC	—	110 (90 – 140)	110 (90 – 140)
				● ◐ ✣	0.5–0.75DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	DC	—	90 (70 – 120)	90 (70 – 120)
		>200HB		● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 110)	90 (70 – 110)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Ferritic and martensitic stainless steel	≤200HB	Wet	● ◐ ✣	≤0.25DC	120 (100 – 150)	120 (100 – 150)	—
				● ◐ ✣	0.25–0.5DC	110 (90 – 140)	110 (90 – 140)	—
				● ◐ ✣	0.5–0.75DC	90 (70 – 120)	90 (70 – 120)	—
				● ◐ ✣	DC	90 (70 – 120)	90 (70 – 120)	—
	Duplex stainless steel	≤280HB	Wet	● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Precipitation hardening stainless steel	<450HB	Wet	● ◐ ✣	≤0.25DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.25–0.5DC	—	80 (60 – 110)	80 (60 – 110)
				● ◐ ✣	0.5–0.75DC	—	60 (40 – 90)	60 (40 – 90)
				● ◐ ✣	DC	—	60 (40 – 90)	60 (40 – 90)
S	Titanium alloys	Ti – 6Al – 4V,etc.	Wet	● ◐	≤0.25DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	0.25–0.5DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	0.5–0.75DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	DC	50 (40 – 70)	50 (40 – 70)	—
				✣	≤0.25DC	—	40 (30 – 60)	40 (30 – 60)
				✣	0.25–0.5DC	—	40 (30 – 60)	40 (30 – 60)
				✣	0.5–0.75DC	—	40 (30 – 60)	40 (30 – 60)
				✣	DC	—	40 (30 – 60)	40 (30 – 60)
		Ti-5553,etc.		● ◐ ✣	≤0.25DC	—	30 (20 – 40)	30 (20 – 40)
				● ◐ ✣	0.25–0.5DC	—	30 (20 – 40)	30 (20 – 40)
				● ◐ ✣	0.5–0.75DC	—	30 (20 – 40)	30 (20 – 40)
				● ◐ ✣	DC	—	30 (20 – 40)	30 (20 – 40)
	Heat resistant alloys	—	Wet	● ◐	≤0.25DC	40 (30 – 60)	—	—
				● ◐	0.25–0.5DC	40 (30 – 60)	—	—
				● ◐	0.5–0.75DC	40 (30 – 60)	—	—
				● ◐	DC	40 (30 – 60)	—	—
				✣	≤0.25DC	—	30 (20 – 40)	30 (20 – 40)
				✣	0.25–0.5DC	—	30 (20 – 40)	30 (20 – 40)
				✣	0.5–0.75DC	—	30 (20 – 40)	30 (20 – 40)
				✣	DC	—	30 (20 – 40)	30 (20 – 40)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX300								
P	Mild steel	≤180HB	Dry	● ◐	≤0.25DC	230 (180 – 270)	—	—
				● ◐	0.25–0.5DC	220 (170 – 260)	—	—
				● ◐	0.5–0.75DC	180 (140 – 210)	—	—
				● ◐	DC	180 (140 – 210)	—	—
				✣	≤0.25DC	—	200 (150 – 240)	—
				✣	0.25–0.5DC	—	190 (170 – 260)	—
				✣	0.5–0.75DC	—	150 (110 – 180)	—
				✣	DC	—	150 (110 – 180)	—
	Carbon steel Alloy steel	180 – 280HB	Dry	● ◐	≤0.25DC	180 (140 – 210)	—	—
				● ◐	0.25–0.5DC	170 (130 – 200)	—	—
				● ◐	0.5–0.75DC	140 (110 – 160)	—	—
				● ◐	DC	140 (110 – 160)	—	—
				✣	≤0.25DC	—	150 (110 – 180)	—
				✣	0.25–0.5DC	—	140 (100 – 170)	—
				✣	0.5–0.75DC	—	110 (80 – 130)	—
				✣	DC	—	110 (80 – 130)	—
		280 – 350HB		● ◐	≤0.25DC	180 (140 – 210)	—	—
				● ◐	0.25–0.5DC	170 (130 – 200)	—	—
				● ◐	0.5–0.75DC	140 (110 – 160)	—	—
				● ◐	DC	140 (110 – 160)	—	—
				✣	≤0.25DC	—	150 (110 – 180)	—
				✣	0.25–0.5DC	—	140 (100 – 170)	—
				✣	0.5–0.75DC	—	110 (80 – 130)	—
				✣	DC	—	110 (80 – 130)	—
	Alloy tool steel	≤350HB Annealing	Dry	● ◐	≤0.25DC	180 (140 – 210)	—	—
				● ◐	0.25–0.5DC	170 (130 – 200)	—	—
				● ◐	0.5–0.75DC	140 (110 – 160)	—	—
				● ◐	DC	140 (110 – 160)	—	—
				✣	≤0.25DC	—	150 (110 – 180)	—
				✣	0.25–0.5DC	—	140 (100 – 170)	—
				✣	0.5–0.75DC	—	110 (80 – 130)	—
				✣	DC	—	110 (80 – 130)	—
	Pre-hardened steel	35 – 45HRC	Dry	● ◐	≤0.25DC	120 (90 – 140)	—	—
				● ◐	0.25–0.5DC	110 (80 – 130)	—	—
				● ◐	0.5–0.75DC	100 (70 – 120)	—	—
				● ◐	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	100 (80 – 120)	—
				✣	0.25–0.5DC	—	90 (70 – 110)	—
				✣	0.5–0.75DC	—	80 (60 – 100)	—
				✣	DC	—	80 (60 – 100)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX300								
M	Austenitic stainless steel	≤200HB	Dry	● ◐ ✣	≤0.25DC	—	180 (140 – 210)	180 (140 – 210)
				● ◐ ✣	0.25–0.5DC	—	170 (130 – 200)	170 (130 – 200)
				● ◐ ✣	0.5–0.75DC	—	140 (110 – 160)	140 (110 – 160)
				● ◐ ✣	DC	—	140 (110 – 160)	140 (110 – 160)
		>200HB		● ◐ ✣	≤0.25DC	—	150 (110 – 180)	150 (110 – 180)
				● ◐ ✣	0.25–0.5DC	—	140 (100 – 160)	140 (100 – 160)
				● ◐ ✣	0.5–0.75DC	—	110 (80 – 130)	110 (80 – 130)
				● ◐ ✣	DC	—	110 (80 – 130)	110 (80 – 130)
	Ferritic and martensitic stainless steel	≤200HB	Dry	● ◐ ✣	≤0.25DC	180 (140 – 210)	180 (140 – 210)	—
				● ◐ ✣	0.25–0.5DC	170 (130 – 200)	170 (130 – 200)	—
				● ◐ ✣	0.5–0.75DC	140 (110 – 160)	140 (110 – 160)	—
				● ◐ ✣	DC	140 (110 – 160)	140 (110 – 160)	—
	Duplex stainless steel	≤280HB	Dry	● ◐ ✣	≤0.25DC	—	140 (110 – 170)	140 (110 – 170)
				● ◐ ✣	0.25–0.5DC	—	130 (90 – 150)	130 (90 – 150)
				● ◐ ✣	0.5–0.75DC	—	100 (70 – 120)	100 (70 – 120)
				● ◐ ✣	DC	—	100 (70 – 120)	100 (70 – 120)
	Precipitation hardening stainless steel	<450HB	Dry	● ◐ ✣	≤0.25DC	—	130 (100 – 160)	130 (100 – 160)
				● ◐ ✣	0.25–0.5DC	—	120 (80 – 140)	120 (80 – 140)
				● ◐ ✣	0.5–0.75DC	—	90 (60 – 110)	90 (60 – 110)
				● ◐ ✣	DC	—	90 (60 – 110)	90 (60 – 110)
P	Mild steel	≤180HB	Wet	● ◐ ✣	≤0.25DC	140 (100 – 190)	140 (100 – 190)	—
				● ◐ ✣	0.25–0.5DC	130 (90 – 180)	130 (90 – 180)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
	Carbon steel Alloy steel	180 – 280HB		● ◐ ✣	≤0.25DC	120 (90 – 140)	120 (90 – 140)	—
				● ◐ ✣	0.25–0.5DC	110 (80 – 130)	110 (80 – 130)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
		280 – 350HB		● ◐ ✣	≤0.25DC	120 (90 – 140)	120 (90 – 140)	
				● ◐ ✣	0.25–0.5DC	110 (80 – 130)	110 (80 – 130)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
	Alloy tool steel	≤350HB Annealing	Wet	● ◐ ✣	≤0.25DC	120 (90 – 140)	120 (90 – 140)	—
				● ◐ ✣	0.25–0.5DC	110 (80 – 130)	110 (80 – 130)	—
				● ◐ ✣	0.5–0.75DC	100 (70 – 120)	100 (70 – 120)	—
				● ◐ ✣	DC	100 (70 – 120)	100 (70 – 120)	—
	Pre-hardened steel	35 – 45HRC	Wet	● ◐ ✣	≤0.25DC	100 (80 – 120)	100 (80 – 120)	—
				● ◐ ✣	0.25–0.5DC	90 (70 – 110)	90 (70 – 110)	—
				● ◐ ✣	0.5–0.75DC	80 (60 – 100)	80 (60 – 100)	—
				● ◐ ✣	DC	80 (60 – 100)	80 (60 – 100)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX300								
M	Austenitic stainless steel	≤200HB	Wet	● ◐ ✣	≤0.25DC	—	120 (100 – 150)	120 (100 – 150)
				● ◐ ✣	0.25–0.5DC	—	110 (90 – 140)	110 (90 – 140)
				● ◐ ✣	0.5–0.75DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	DC	—	90 (70 – 120)	90 (70 – 120)
		>200HB		● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Ferritic and martensitic stainless steel	≤200HB	Wet	● ◐ ✣	≤0.25DC	120 (100 – 150)	120 (100 – 150)	—
				● ◐ ✣	0.25–0.5DC	110 (90 – 140)	110 (90 – 140)	—
				● ◐ ✣	0.5–0.75DC	90 (70 – 120)	90 (70 – 120)	—
				● ◐ ✣	DC	90 (70 – 120)	90 (70 – 120)	—
	Duplex stainless steel	≤280HB	Wet	● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Precipitation hardening stainless steel	<450HB	Wet	● ◐ ✣	≤0.25DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.25–0.5DC	—	80 (60 – 110)	80 (60 – 110)
				● ◐ ✣	0.5–0.75DC	—	60 (40 – 90)	60 (40 – 90)
				● ◐ ✣	DC	—	60 (40 – 90)	60 (40 – 90)
S	Titanium alloys	Ti – 6Al – 4V,etc.	Wet	● ◐	≤0.25DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	0.25–0.5DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	0.5–0.75DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	DC	50 (40 – 70)	50 (40 – 70)	—
				✣	≤0.25DC	—	40 (30 – 60)	40 (30 – 60)
				✣	0.25–0.5DC	—	40 (30 – 60)	40 (30 – 60)
				✣	0.5–0.75DC	—	40 (30 – 60)	40 (30 – 60)
				✣	DC	—	40 (30 – 60)	40 (30 – 60)
		Ti-5553,etc.		● ◐ ✣	≤0.25DC	—	30 (20 – 40)	30 (20 – 40)
				● ◐ ✣	0.25–0.5DC	—	30 (20 – 40)	30 (20 – 40)
				● ◐ ✣	0.5–0.75DC	—	30 (20 – 40)	30 (20 – 40)
				● ◐ ✣	DC	—	30 (20 – 40)	30 (20 – 40)
	Heat resistant alloys	—	Wet	● ◐	≤0.25DC	40 (30 – 60)	—	—
				● ◐	0.25–0.5DC	40 (30 – 60)	—	—
				● ◐	0.5–0.75DC	40 (30 – 60)	—	—
				● ◐	DC	40 (30 – 60)	—	—
				✣	≤0.25DC	—	30 (20 – 40)	30 (20 – 40)
				✣	0.25–0.5DC	—	30 (20 – 40)	30 (20 – 40)
				✣	0.5–0.75DC	—	30 (20 – 40)	30 (20 – 40)
				✣	DC	—	30 (20 – 40)	30 (20 – 40)
AXD4000								
P	Mild steel	≤180HB	Dry, Wet	●	—	200 (150 – 220)	—	—
	Carbon steel, Alloy steel	180 – 280HB	Dry, Wet	●	—	200 (150 – 220)	—	—
N	Aluminium Alloys	Si<5%	Dry, Wet	●	—	1000 (200 – 3000)	—	—
		Si>5%	Dry, Wet	●	—	1000 (200 – 3000)	—	—
AXD4000A								
N	Aluminium Alloys	Si<5%	Dry, Wet	●	—	4000 (2000 – 5000)	—	—
AXD7000								
P	Mild steel	≤180HB	Dry, Wet	●	—	200 (150 – 220)	—	—
	Carbon steel, Alloy steel	180 – 280HB	Dry, Wet	●	—	200 (150 – 220)	—	—
S	Titanium alloys	—	Wet	●	—	40 (30 – 60)	—	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	BXD4000							
P	Mild steel	≤180HB	Dry, Wet	●	—	180 (150 – 200)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	●	—	150 (120 – 200)	—	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	●	—	140 (120 – 160)	—	—
M	Stainless steel	≤270HB	Dry, Wet	●	—	140 (120 – 160)	—	—
S	Titanium alloys	—	Wet	●	—	40 (30 – 60)	—	—
S	Heat resistant alloys	—	Wet	●	—	30 (20 – 40)	—	—
	AQX							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	200 (170 – 240)	160 (130 – 200)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	180 (140 – 220)	140 (100 – 180)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐ ✣	—	180 (140 – 220)	140 (100 – 180)	—
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	—	—	170 (120 – 200)	160 (100 – 180)
M	Austenitic stainless steel	>200HB	Dry, Wet	● ◐ ✣	—	—	170 (120 – 200)	160 (100 – 180)
M	Ferritic and martensitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	—	170 (120 – 200)	170 (120 – 200)	160 (100 – 180)
M	Ferritic and martensitic stainless steel	>200HB	Dry, Wet	● ◐ ✣	—	170 (120 – 200)	170 (120 – 200)	160 (100 – 180)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (30 – 70)	50 (30 – 70)	50 (30 – 70)
	AJX							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	150 (100 – 200)	130 (80 – 180)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	130 (80 – 180)	110 (60 – 160)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐ ✣	—	100 (50 – 150)	80 (30 – 130)	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐ ✣	—	100 (50 – 150)	80 (30 – 120)	—
P	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐ ✣	—	100 (70 – 130)	80 (50 – 110)	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐ ✣	—	—	140 (100 – 180)	120 (80 – 160)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (40 – 60)	45 (30 – 55)	40 (30 – 50)
S	Heat resistant alloys	—	Wet	● ◐ ✣	—	30 (20 – 40)	25 (20 – 35)	20 (15 – 30)
	WJX09							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	170 (120 – 220)	160 (110 – 200)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	160 (100 – 220)	140 (90 – 200)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐ ✣	—	160 (100 – 220)	140 (90 – 200)	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐ ✣	—	160 (100 – 220)	140 (90 – 200)	—
P	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐ ✣	—	120 (80 – 160)	100 (60 – 140)	—
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	—	—	160 (130 – 200)	150 (120 – 180)
M	Austenitic stainless steel	>200HB	Dry, Wet	● ◐ ✣	—	—	140 (100 – 200)	130 (80 – 180)
M	Ferritic and martensitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	—	150 (100 – 200)	150 (100 – 200)	130 (80 – 180)
M	Duplex stainless steel	≤280HB	Dry, Wet	● ◐ ✣	—	—	130 (80 – 180)	110 (60 – 160)
M	Precipitation hardening stainless steel	<450HB	Dry, Wet	● ◐ ✣	—	—	110 (60 – 160)	90 (50 – 130)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (30 – 65)	40 (30 – 60)	40 (30 – 60)
S	Heat resistant alloys	—	Wet	● ◐ ✣	—	40 (20 – 50)	30 (20 – 40)	30 (20 – 40)
	WJX14							
P	Mild steel	≤180HB	Dry, Wet	● ◐ ✣	—	150 (100 – 200)	140 (90 – 180)	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐ ✣	—	140 (80 – 200)	120 (70 – 180)	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐ ✣	—	140 (80 – 200)	120 (70 – 180)	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐ ✣	—	140 (80 – 200)	120 (70 – 180)	—
P	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐ ✣	—	110 (70 – 150)	90 (50 – 130)	—
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	—	—	160 (130 – 200)	150 (120 – 180)
M	Austenitic stainless steel	>200HB	Dry, Wet	● ◐ ✣	—	—	140 (100 – 200)	130 (80 – 180)
M	Ferritic and martensitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	—	150 (100 – 200)	150 (100 – 200)	130 (80 – 180)
M	Duplex stainless steel	≤280HB	Dry, Wet	● ◐ ✣	—	—	130 (80 – 180)	110 (60 – 160)
M	Precipitation hardening stainless steel	<450HB	Dry, Wet	● ◐ ✣	—	—	110 (60 – 160)	90 (50 – 130)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (30 – 65)	40 (30 – 60)	40 (30 – 60)
S	Heat resistant alloys	—	Wet	● ◐ ✣	—	40 (20 – 50)	30 (20 – 40)	30 (20 – 40)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

MULTI-FUNCTIONAL MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	ARP							
M	Austenitic stainless steel	≤200HB	Dry	● ◐ ✣	—	—	200 (150 – 250)	180 (130-230)
		>200HB		● ◐ ✣	—	—	170 (120 – 220)	150 (100-200)
	Ferritic and martensitic stainless steel	—	Dry	● ◐ ✣	—	200 (150 – 250)	200 (150 – 250)	180 (130-230)
	Duplex stainless steel	≤280HB	Dry	● ◐ ✣	—	—	160 (110 – 210)	140 (90-190)
	Precipitation hardening stainless steel	<450HB	Dry	● ◐ ✣	—	—	150 (100 – 200)	130 (80-180)
	Austenitic stainless steel	≤200HB	Wet	● ◐ ✣	—	—	130 (80 – 180)	110 (60-160)
		>200HB		● ◐ ✣	—	—	100 (80 – 150)	80 (60-130)
	Ferritic and martensitic stainless steel	—	Wet	● ◐ ✣	—	130 (80 – 180)	130 (80 – 180)	110 (60-160)
	Duplex stainless steel	≤280HB	Wet	● ◐ ✣	—	—	100 (80 – 150)	80 (60-130)
	Precipitation hardening stainless steel	<450HB	Wet	● ◐ ✣	—	—	90 (50 – 140)	70 (30-120)
S	Titanium alloys	—	Wet	● ◐ ✣	—	50 (35-60)	45 (30 – 55)	40 (30 – 50)
	Heat resistant alloys	—	Wet	● ◐ ✣	—	40 (20-50)	35 (15 – 45)	30 (15 – 40)
	BRP							
P	Mild steel	≤180HB	Dry, Wet	● ◐	—	250 (200 – 300)	—	—
	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	—	180 (130 – 220)	—	—
		280 – 350HB		● ◐	—	160 (110 – 190)	—	—
	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐	—	120 (80 – 140)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	—	180 (130 – 220)	—	—

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Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX200-L								
P	Mild steel	≤180HB	Dry, Wet	●	≤0.25DC	140 (100 – 190)	—	—
				●	0.25–0.5DC	130 (90 – 180)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	140 (100 – 190)	—
				✣	0.25–0.5DC	—	130 (90 – 180)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	120 (90 – 140)	—
				✣	0.25–0.5DC	—	110 (80 – 130)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
		280 – 350HB		●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	120 (90 – 140)	—
				✣	0.25–0.5DC	—	110 (80 – 130)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
	Alloy tool steel	≤350HB Annealing	Dry, Wet	●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	120 (90 – 140)	—
				✣	0.25–0.5DC	—	110 (80 – 130)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
	Pre-hardened steel	35 – 45HRC	Dry, Wet	●	≤0.25DC	100 (80 – 120)	—	—
				●	0.25–0.5DC	90 (70 – 110)	—	—
				●	0.5–0.75DC	80 (60 – 100)	—	—
				●	DC	80 (60 – 100)	—	—
				✣	≤0.25DC	—	100 (80 – 120)	—
				✣	0.25–0.5DC	—	90 (70 – 110)	—
				✣	0.5–0.75DC	—	80 (60 – 100)	—
				✣	DC	—	80 (60 – 100)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

DEEP SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX200-L								
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	≤0.25DC	—	120 (100 – 150)	120 (100 – 150)
				● ◐ ✣	0.25–0.5DC	—	110 (90 – 140)	110 (90 – 140)
				● ◐ ✣	0.5–0.75DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	DC	—	90 (70 – 120)	90 (70 – 120)
		>200HB		● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Ferritic and martensitic stainless steel	—	Dry, Wet	● ◐ ✣	≤0.25DC	120 (100 – 150)	120 (100 – 150)	—
				● ◐ ✣	0.25–0.5DC	110 (90 – 140)	110 (90 – 140)	—
				● ◐ ✣	0.5–0.75DC	90 (70 – 120)	90 (70 – 120)	—
				● ◐ ✣	DC	90 (70 – 120)	90 (70 – 120)	—
	Duplex stainless steel	≤280HB	Dry, Wet	● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Precipitation hardening stainless steel	<450HB	Dry, Wet	● ◐ ✣	≤0.25DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.25–0.5DC	—	80 (60 – 110)	80 (60 – 110)
				● ◐ ✣	0.5–0.75DC	—	60 (40 – 90)	60 (40 – 90)
				● ◐ ✣	DC	—	60 (40 – 90)	60 (40 – 90)
S	Titanium alloys	Ti – 6Al – 4V,etc.	Wet	● ◐	≤0.25DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	0.25–0.5DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	0.5–0.75DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	DC	50 (40 – 70)	50 (40 – 70)	—
				✣	≤0.25DC	—	50 (40 – 70)	50 (40 – 70)
				✣	0.25–0.5DC	—	50 (40 – 70)	50 (40 – 70)
				✣	0.5–0.75DC	—	50 (40 – 70)	50 (40 – 70)
				✣	DC	—	50 (40 – 70)	50 (40 – 70)
	Titanium alloys	Ti-5553,etc.	Wet	● ◐	≤0.25DC	30 (20 – 40)	30 (20 – 40)	—
				● ◐	0.25–0.5DC	30 (20 – 40)	30 (20 – 40)	—
				● ◐	0.5–0.75DC	30 (20 – 40)	30 (20 – 40)	—
				● ◐	DC	30 (20 – 40)	30 (20 – 40)	—
				✣	≤0.25DC	—	30 (20 – 40)	30 (20 – 40)
				✣	0.25–0.5DC	—	30 (20 – 40)	30 (20 – 40)
				✣	0.5–0.75DC	—	30 (20 – 40)	30 (20 – 40)
				✣	DC	—	30 (20 – 40)	30 (20 – 40)
	Heat resistant alloys	—	Wet	●	≤0.25DC	40 (30 – 60)	—	—
				●	0.25–0.5DC	40 (30 – 60)	—	—
				●	0.5–0.75DC	40 (30 – 60)	—	—
				●	DC	40 (30 – 60)	—	—
				◐ ✣	≤0.25DC	—	40 (30 – 60)	40 (30 – 60)
				◐ ✣	0.25–0.5DC	—	40 (30 – 60)	40 (30 – 60)
				◐ ✣	0.5–0.75DC	—	40 (30 – 60)	40 (30 – 60)
				◐ ✣	DC	—	40 (30 – 60)	40 (30 – 60)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

DEEP SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX300-L								
P	Mild steel	≤180HB	Dry, Wet	●	≤0.25DC	140 (100 – 190)	—	—
				●	0.25–0.5DC	130 (90 – 180)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	140 (100 – 190)	—
				✣	0.25–0.5DC	—	130 (90 – 180)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	120 (90 – 140)	—
				✣	0.25–0.5DC	—	110 (80 – 130)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
		280 – 350HB		●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	120 (90 – 140)	—
				✣	0.25–0.5DC	—	110 (80 – 130)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
	Alloy tool steel	≤350HB Annealing	Dry, Wet	●	≤0.25DC	120 (90 – 140)	—	—
				●	0.25–0.5DC	110 (80 – 130)	—	—
				●	0.5–0.75DC	100 (70 – 120)	—	—
				●	DC	100 (70 – 120)	—	—
				✣	≤0.25DC	—	120 (90 – 140)	—
				✣	0.25–0.5DC	—	110 (80 – 130)	—
				✣	0.5–0.75DC	—	100 (70 – 120)	—
				✣	DC	—	100 (70 – 120)	—
	Pre-hardened steel	35 – 45HRC	Dry, Wet	●	≤0.25DC	100 (80 – 120)	—	—
				●	0.25–0.5DC	90 (70 – 110)	—	—
				●	0.5–0.75DC	80 (60 – 100)	—	—
				●	DC	80 (60 – 100)	—	—
				✣	≤0.25DC	—	100 (80 – 120)	—
				✣	0.25–0.5DC	—	90 (70 – 110)	—
				✣	0.5–0.75DC	—	80 (60 – 100)	—
				✣	DC	—	80 (60 – 100)	—

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

DEEP SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
VPX300-L								
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐ ✣	≤0.25DC	—	120 (100 – 150)	120 (100 – 150)
				● ◐ ✣	0.25–0.5DC	—	110 (90 – 140)	110 (90 – 140)
				● ◐ ✣	0.5–0.75DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	DC	—	90 (70 – 120)	90 (70 – 120)
		>200HB		● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Ferritic and martensitic stainless steel	—	Dry, Wet	● ◐ ✣	≤0.25DC	120 (100 – 150)	120 (100 – 150)	—
				● ◐ ✣	0.25–0.5DC	110 (90 – 140)	110 (90 – 140)	—
				● ◐ ✣	0.5–0.75DC	90 (70 – 120)	90 (70 – 120)	—
				● ◐ ✣	DC	90 (70 – 120)	90 (70 – 120)	—
	Duplex stainless steel	≤280HB	Dry, Wet	● ◐ ✣	≤0.25DC	—	100 (80 – 130)	100 (80 – 130)
				● ◐ ✣	0.25–0.5DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.5–0.75DC	—	70 (50 – 100)	70 (50 – 100)
				● ◐ ✣	DC	—	70 (50 – 100)	70 (50 – 100)
	Precipitation hardening stainless steel	<450HB	Dry, Wet	● ◐ ✣	≤0.25DC	—	90 (70 – 120)	90 (70 – 120)
				● ◐ ✣	0.25–0.5DC	—	80 (60 – 110)	80 (60 – 110)
				● ◐ ✣	0.5–0.75DC	—	60 (40 – 90)	60 (40 – 90)
				● ◐ ✣	DC	—	60 (40 – 90)	60 (40 – 90)
S	Titanium alloys	Ti – 6Al – 4V,etc.	Wet	● ◐	≤0.75DC	50 (40 – 70)	50 (40 – 70)	—
				● ◐	DC	50 (40 – 70)	50 (40 – 70)	—
				✣	≤0.75DC	—	50 (40 – 70)	50 (40 – 70)
				✣	DC	—	50 (40 – 70)	50 (40 – 70)
		Ti-5553,etc.	Wet	● ◐	≤0.75DC	30 (20 – 40)	30 (20 – 40)	—
				● ◐	DC	30 (20 – 40)	30 (20 – 40)	—
				✣	≤0.75DC	—	30 (20 – 40)	30 (20 – 40)
				✣	DC	—	30 (20 – 40)	30 (20 – 40)
	Heat resistant alloys	—	Wet	● ◐	≤0.75DC	40 (30 – 60)	—	—
				● ◐	DC	40 (30 – 60)	—	—
				✣	≤0.75DC	—	40 (30 – 60)	40 (30 – 60)
				✣	DC	—	40 (30 – 60)	40 (30 – 60)

Cutting conditions : ● : Stable cutting ◐ : General cutting ✣ : Unstable cutting

DEEP SHOULDER MILLING

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	SPX Shank							
P	Mild steel	≤180HB	Dry, Wet	● ◐	Shoulder milling	120 (100 – 140)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	Shoulder milling	80 (70 – 120)	—	—
P		280 – 350HB		● ◐	Shoulder milling	80 (70 – 120)	—	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	Shoulder milling	80 (60 – 100)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	Shoulder milling	—	80 (60 – 100)	—
S	Titanium alloys	—	Wet	● ◐	Shoulder milling	—	40 (35 – 50)	—
P	Mild steel	≤180HB	Dry, Wet	● ◐	DC	60 (50 – 120)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	DC	60 (50 – 100)	—	—
P		280 – 350HB		● ◐	DC	60 (50 – 100)	—	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	DC	50 (40 – 80)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	DC	—	40 (35 – 80)	—
S	Titanium alloys	–	Wet	● ◐	DC	—	35 (30 – 50)	—
	SPX Shell							
P	Mild steel	≤180HB	Dry, Wet	● ◐	≤0.5DC	120 (100 – 140)	—	—
P				● ◐	>0.5DC	120 (100 – 140)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	≤0.5DC	120 (80 – 130)	—	—
P				● ◐	>0.5DC	100 (80 – 120)	—	—
P		280 – 350HB		● ◐	≤0.5DC	120 (80 – 130)	—	—
P				● ◐	>0.5DC	100 (80 – 120)	—	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	≤0.5DC	100 (60 – 110)	—	—
P				● ◐	>0.5DC	80 (60 – 100)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	≤0.5DC	—	140 (100 – 150)	—
M				● ◐	>0.5DC	—	120 (100 – 140)	—
S	Titanium alloys	—	Wet	● ◐	≤0.5DC	—	45 (35 – 50)	—
S				● ◐	>0.5DC	—	40 (35 – 50)	—
P	Mild steel	≤180HB	Dry, Wet	● ◐	DC	120 (100 – 140)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	DC	100 (80 – 120)	—	—
P		280 – 350HB		● ◐	DC	100 (80 – 120)	—	—
P	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	DC	80 (60 – 100)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	DC	—	100 (80 – 140)	—
S	Titanium alloys	—	Wet	● ◐	DC	—	40 (35 – 50)	—

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Cutting conditions : ● : Stable cutting ◐ : General cutting ✤ : Unstable cutting

COPYING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	SRM2							
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	DC	160 (120 – 200)	—	—
		280 – 350HB		● ◐	DC	140 (120 – 160)	—	—
	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	DC	140 (120 – 160)	—	—
	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐	DC	120 (100 – 160)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	DC	200 (100 – 250)	—	—
S	Titanium alloys	—	Wet	● ◐	DC	50 (30 – 60)	—	—
	Heat resistant alloys	—	Wet	● ◐	DC	40 (30 – 60)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	Small cutting depth	200 (160 – 250)	—	—
		280 – 350HB		● ◐	Small cutting depth	160 (120 – 200)	—	—
	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	Small cutting depth	160 (120 – 200)	—	—
	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐	Small cutting depth	160 (120 – 200)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	Small cutting depth	200 (100 – 250)	—	—
S	Titanium alloys	—	Wet	● ◐	Small cutting depth	50 (30 – 60)	—	—
	Heat resistant alloys	—	Wet	● ◐	Small cutting depth	40 (30 – 60)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	Large cutting depth	200 (160 – 250)	—	—
		280 – 350HB		● ◐	Large cutting depth	160 (120 – 200)	—	—
	Alloy tool steel	≤350HB Annealing	Dry, Wet	● ◐	Large cutting depth	160 (120 – 200)	—	—
	Pre-hardened steel	35 – 45HRC	Dry, Wet	● ◐	Large cutting depth	160 (120 – 200)	—	—
M	Stainless steel	≤270HB	Dry, Wet	● ◐	Large cutting depth	200 (100 – 250)	—	—
S	Titanium alloys	—	Wet	● ◐	Large cutting depth	50 (30 – 60)	—	—
	Heat resistant alloys	—	Wet	● ◐	Large cutting depth	40 (30 – 60)	—	—

1/1

Cutting conditions : ● : Stable cutting ◐ : General cutting ✤ : Unstable cutting

SPOT MILLING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	CBJP							
P	Mild steel	≤180HB	Dry, Wet	● ◐	—	180 (100 – 200)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	—	180 (100 – 200)	—	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐	—	120 (80 – 160)	—	—
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐	—	150 (100 – 200)	—	—
	CBMP							
P	Mild steel	≤180HB	Dry, Wet	● ◐	—	180 (100 – 200)	—	—
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	—	180 (100 – 200)	—	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐	—	120 (80 – 160)	—	—
M	Austenitic stainless steel	≤200HB	Dry, Wet	● ◐	—	150 (100 – 200)	—	—

1/1

VERTICAL FEED MILLING

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Cutting mode	Cutting conditions	ae	MP1220 Vc	MP1230 Vc	MP1240 Vc
	PMF							
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	—	250 (150 – 350)	—	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐	—	200 (100 – 300)	—	—
	PMR							
P	Carbon steel Alloy steel	180 – 280HB	Dry, Wet	● ◐	—	180 (150 – 200)	—	—
P	Carbon steel Alloy steel	280 – 350HB	Dry, Wet	● ◐	—	180 (150 – 200)	—	—

1/1

Cutting conditions : ● : Stable cutting ◐ : General cutting ✤ : Unstable cutting

ASX SERIES

FOR STABLE FACE AND SHOULDER MILLING EVEN UNDER HEAVY CUTTING CONDITIONS

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NEW

ASX300

SCREW-ON INSERT TYPE MILLING CUTTER

ECO-FRIENDLY DOWNSIZED MODEL

The downsized model features a multi-tooth design that increases table feed, resulting in shorter machining time and reduced power consumption - ultimately helping to lower CO_2 emissions.
In addition, by keeping the cutting load per tooth at an optimal level, tool life can be extended thereby reducing the overall number of inserts required.

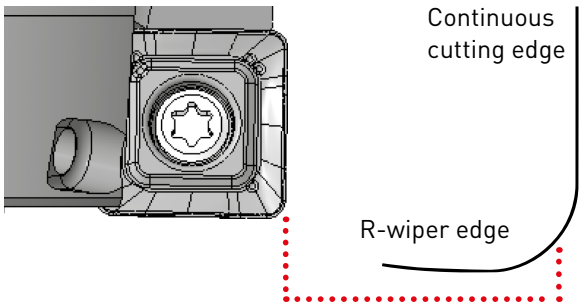
IMPROVED CUTTING EDGE RIDGE

ASX300 inserts have a smooth continuous cutting edge that improves the surface finish and dimensional accuracy of the component.

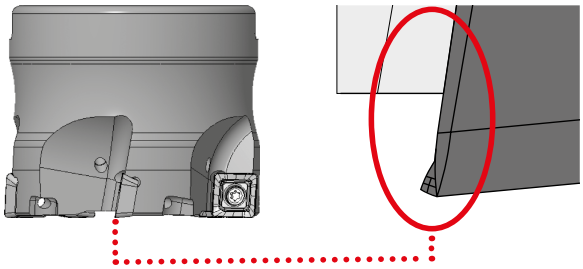
OPTIMISED CUTTING EDGE GEOMETRY

The geometry of the ASX300 optimises the contact with the workpiece. This provides edge strength and improves chip evacuation. The extra edge strength resists damage even under high cutting loads.

Improved cutting edge profile



Cutting edge optimisation



SURFACE FINISH COMPARISON WHEN MACHINING 1.7225

Achieves a glossy finish without machining marks.

ASX300

Conventional

Material	1.7225
Tool	MV1030 M
DC (mm)	25
Vc (m/min)	300
fz (mm/t)	0.15
ap (mm)	0.5
ae (mm)	25
Cutting mode	Dry cutting Single Insert

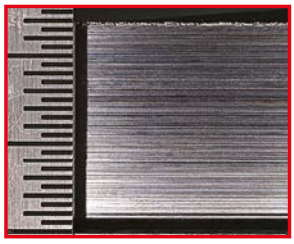
NEW

ASX300

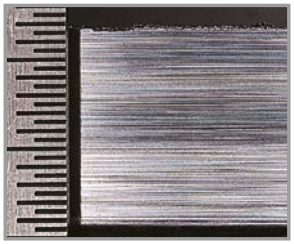
SCREW-IN INSERT TYPE MILLING CUTTER

COMPARISON OF WALL SURFACE ACCURACY AFTER SHOULDER MILLING 1.7225

The improved cutting edge geometry reduces the machining step marks.



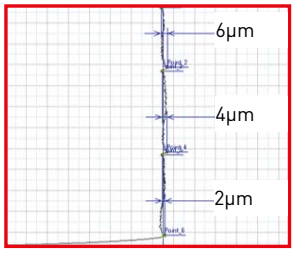
ASX300



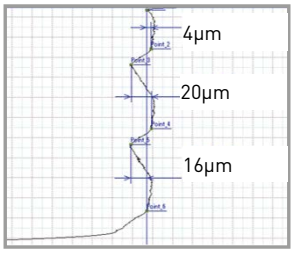
Conventional

Material	1.7225
Tool	MV1030 M
DC (mm)	25
Vc (m/min)	250
fz (mm/t)	0.1
ap (mm)	3^{x3}
ae (mm)	3
Cutting mode	Dry cutting Single Insert

MAXIMUM STEP HEIGHT: 6 µm

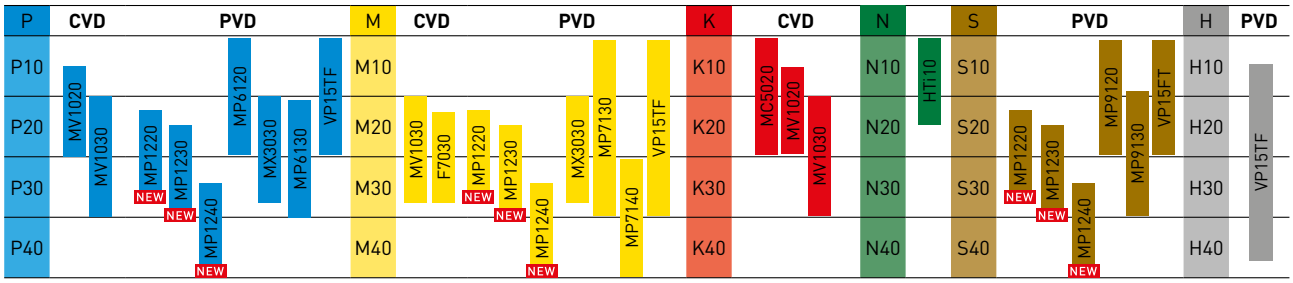


MAXIMUM STEP HEIGHT: 20 µm



ASX SERIES

INSERT GRADES FOR A WIDE RANGE OF MATERIALS



* When machining steel or stainless steel where the emphasis is on surface finish, use cermet grade MX3030.
Stable Cutting: Continuous cutting, constant depth of cut, pre-machined securely clamped component cutting.
Unstable Cutting: Heavy interrupted, irregular depth of cut, low clamping rigidity cutting.

MP1220
For stable machining operations with an emphasis on wear resistance.

MP1230
Ideal for medium machining applications and for light interrupted cutting.

MP1240
The toughest grade for heavy machining and rough interrupted applications.

MV1020
This grade has advanced wear and thermal shock resistance and also achieves stable cutting at unprecedented cutting speeds, especially when machining steel and ductile cast iron, thus greatly reducing work time.

MV1030
The new Al-Rich coating also provides excellent wear resistance. An unprecedented performance against sudden breakage was also realised especially during problematic wet cutting and when machining stainless steels.

MP6120
For general milling of steel.

MP6130
For interrupted milling of steel.

MP7130
For general milling of stainless steel.

MP7140
For unstable milling of stainless steel.

MC5020
For general milling of cast iron.

MP9120
For general milling of HRSA and titanium alloy.

MP9130
For interrupted and general milling of HRSA and Titanium alloy.

MX3030
For finishing.

HTi10
For general milling of aluminium.

VP15TF
For stable machining when the coating is combined with a high wear and fracture resistant carbide substrate.

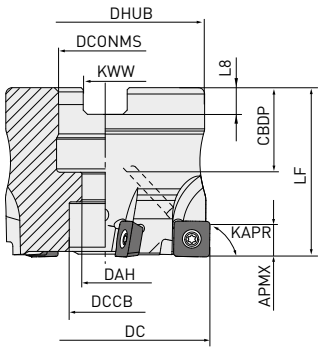
NEW

ASX300

ARBOR TYPE

P M K N S H

1



Order number	Stock R	CICT	APMX	DC	DCONMS	LF	CBDP	DAH	DCCB	DHUB	KWW	L8	WT	Type
ASX300-040A04R	●	4	5.5	40	16	40	18	9	14	37	8.4	6.3	0.22	1
ASX300-040A06R	●	6	5.5	40	16	40	18	9	14	37	8.4	6.3	0.21	1
ASX300-050A05R	●	5	5.5	50	22	40	20	11	17	47	10.4	6.3	0.36	1
ASX300-050A07R	●	7	5.5	50	22	40	20	11	17	47	10.4	6.3	0.36	1
ASX300-063A06R	●	6	5.5	63	22	40	20	11	17	50	10.4	6.3	0.54	1
ASX300-063A08R	●	8	5.5	63	22	40	20	11	17	50	10.4	6.3	0.54	1
ASX300-080A08R	●	8	5.5	80	27	50	23	13	20	56	12.4	7	0.98	1

1/1

1. The rotational speed maximum (RPMX) are set to ensure tool and insert stability.
2. When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
3. A set bolt for the arbor is not included with the body.

117 Vc

● : Inventory maintained. ★ : Inventory maintained in Japan.

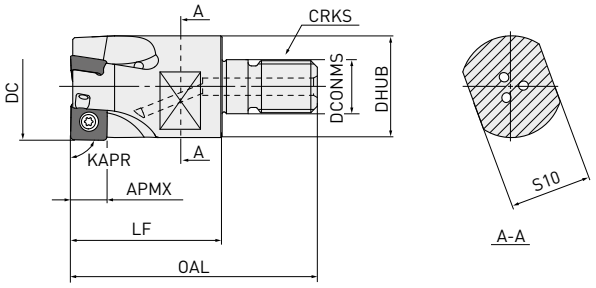
NEW

ASX300

SCREW-IN TYPE

P M K N S H

1



Order number	Stock R	CICT	APMX	DC	DCONMS	LF	DHUB	OAL	CRKS	WT	S10	Type
ASX300R2002AM1030	●	2	5.5	20	10.5	30	18.5	49	M10	0.05	14	1
ASX300R2503AM1235	●	3	5.5	25	12.5	35	23.5	57	M12	0.1	19	1
ASX300R3204AM1640	●	4	5.5	32	17	40	28.5	63	M16	0.2	24	1

1/1

1. Please check the web catalogue for screw-in type mounting arbors.

117 Vc

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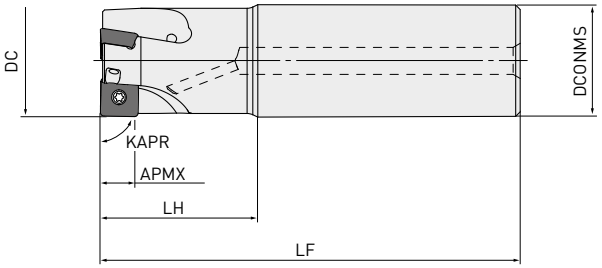
NEW

ASX300

SHANK TYPE

P M K N S H

1



Order number	Stock R	CICT	APMX	DC	DCONMS	LF	LH	WT	Type
ASX300R2002SA16S	●	2	5.5	20	16	100	27	0.14	1
ASX300R2002SA16L	●	2	5.5	20	16	150	27	0.21	1
ASX300R2002SA20S	●	2	5.5	20	20	100	27	0.21	1
ASX300R2002SA20L	●	2	5.5	20	20	150	62	0.31	1
ASX300R2503SA20S	●	3	5.5	25	20	115	35	0.26	1
ASX300R2503SA20L	●	3	5.5	25	20	170	35	0.39	1
ASX300R2503SA25S	●	3	5.5	25	25	115	35	0.38	1
ASX300R2503SA25L	●	3	5.5	25	25	170	73	0.56	1
ASX300R3204SA25S	●	4	5.5	32	25	125	43	0.48	1
ASX300R3204SA25L	●	4	5.5	32	25	190	43	0.71	1
ASX300R3204SA32S	●	4	5.5	32	32	125	43	0.69	1
ASX300R3204SA32L	●	4	5.5	32	32	190	93	1.04	1

1/1

117 Vc

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NEW

ASX300

SPARE PARTS

Tool holder type	 Clamp screw	 Wrench	 Anti-seize Lubricant
ASX300	TPS25-1	TIP07F	MK1KS

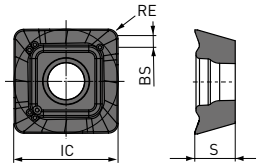
* Clamp torque (N • m): TPS25-1 = 1.0

INSERTS

		MV1020	MV1030	MP1220	MP1230	MP1240	VP15TF	HTi10
P	Steel	◔	◔	◔	◔	✣	◔	
M	Stainless steel	◔	◔	◔	◔	✣	◔	
K	Cast iron	◔	◔				✣	
N	Non-ferrous material							◔
S	Heat resistant alloy, Titanium			◔	◔	◔	◔	
H	Hardened steel						◔	

Cutting conditions :
●: Stable cutting ◔: General cutting
✣: Unstable cutting
Honing:
E: Round F: Sharp edge S: Chamfer + round
T: Chamfer Z: Stable

Order number	Class	Honing	MV1020	MV1030	MP1220	MP1230	MP1240	VP15TF	HTi10	IC	S	BS	RE	Geometry
SOGT083308PEFR-L	G	F							●	8.5	3.3	1.2	0.8	
SOMT083304PEER-L	M	E	●	●	●	●	●	●		8.5	3.3	1.6	0.4	
SOMT083308PEER-L	M	E	●	●	●	●	●	●		8.5	3.3	1.2	0.8	
SOMT083308PEER-M	M	E	●	●	●	●	●	●		8.5	3.3	1.2	0.8	
SOMT083312PEER-M	M	E	●	●	●	●	●	●		8.5	3.3	0.8	1.2	
SOMT083316PEER-M	M	E	●	●	●	●	●	●		8.5	3.3	0.4	1.6	
SOMT083308PEER-R	M	E	●	●	●	●	●	●		8.5	3.3	1.2	0.8	
SOMT083312PEER-R	M	E	●	●	●	●	●	●		8.5	3.3	0.8	1.2	
SOMT083316PEER-R	M	E	●	●	●	●	●	●		8.5	3.3	0.4	1.6	



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NEW

ASX300

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Grade	Vc	L ft		R ft		H ft	
P	Mild steel	≤180HB	MV1020	300 (200 – 400)	0.14 (0.08 – 0.20)	L	0.16 (0.10 – 0.21)	M	0.18 (0.10 – 0.25)	R
			MV1030	275 (200 – 350)						
			MP1220	250 (200 – 300)						
			MP1230	240 (190 – 290)						
			VP15TF	250 (200 – 300)						
	Carbon steel, Alloy steel	180–280HB	MV1020	260 (170 – 350)	0.12 (0.07 – 0.16)	L	0.15 (0.10 – 0.20)	M	0.16 (0.10 – 0.21)	R
			MV1030	260 (170 – 350)						
			MP1220	220 (170 – 270)						
			MP1230	180 (150 – 230)						
			VP15TF	220 (170 – 270)						
		280–350HB	MV1020	180 (100 – 250)	0.10 (0.06 – 0.14)	L	0.14 (0.10 – 0.18)	M	0.15 (0.10 – 0.20)	R
			MV1030	165 (100 – 230)						
			MP1220	140 (100 – 180)						
			MP1230	120 (90 – 150)						
			VP15TF	140 (100 – 180)						
	Stainless steel	≤270HB	MV1030	220 (170 – 270)	0.12 (0.07 – 0.16)	L	0.15 (0.10 – 0.20)	M	0.16 (0.10 – 0.21)	R
			MP1230	220 (170 – 270)						
			MP1240	200 (150 – 250)						
			VP15TF	220 (170 – 270)						
K	Cast iron, Ductile cast iron	Tensile strength <450MPa	MV1020	240 (130 – 350)	0.15 (0.10 – 0.20)	L	0.16 (0.10 – 0.21)	M	0.18 (0.10 – 0.25)	R
			MV1030	190 (130 – 250)						
			VP15TF	180 (130 – 230)						
		Tensile strength >450MPa	MV1020	220 (80 – 350)						
			MV1030	110 (80 – 150)						
N	Aluminium alloy	—	HTi10	650 (300–1000)	0.15 (0.10 – 0.20)	L	0.20 (0.10 – 0.30)	M	0.30 (0.20 – 0.40)	R
S	Titanium alloy	—	MP1220	50 (40 – 60)	0.10 (0.05 – 0.14)	L	0.10 (0.05 – 0.14)	M	0.15 (0.10 – 0.20)	R
			MP1230	45 (30 – 55)						
			MP1240	45 (30 – 55)						
			VP15TF	50 (40 – 60)						
	Heat resistant alloy	—	MP1220	40 (20 – 50)	0.10 (0.05 – 0.14)	L	0.10 (0.05 – 0.14)	M	0.15 (0.10 – 0.20)	R
			MP1230	30 (15 – 45)						
			MP1240	30 (15 – 45)						
			VP15TF	40 (20 – 50)						
H	Hardened steel	40–55HRC	VP15TF	80 (60 – 100)	0.07 (0.04 – 0.09)	L	0.08 (0.05 – 0.11)	M	0.10 (0.07 – 0.12)	R

1/1

1. Revolution (min^{-1}) = (1000 x Cutting Speed) u (3.14 x DC)
2. Table Feed (mm/min) = Feed per Tooth x Number of Teeth x Cutter Revolution

SYMBOLS

Recommended cutting conditions

Completely new products or expansions released in the current Spring or Autumn product launch and are not included in the latest version of the General Catalogue.

Products or expansions that have already been introduced in one of the previous Spring or Autumn product launches but are not included in the latest General Catalogue.

APPLICATION

Face milling

Chamfer milling

Shoulder milling with R

Face milling close to a wall

Shoulder milling

Side milling

Slot milling

Ramping

Pocket milling

Slot milling with R

Copy milling

T-Slot milling

MACHINING TYPE

Roughing

Medium cutting

Light cutting

Pre-finishing

Finishing

Fine-finishing

TOOL MATERIAL

Ultra micro grain carbide
Ultra micro grain carbide substrate material.

Cubic boron nitride
Mitsubishi Materials' original CBN material.

Ceramic
For high speed efficient machining of super alloys due to the excellent high temperature strength property.

High hardness powder metallurgy HSS
High hardness powder metallurgy HSS substrate material.

High grade high alloy HSS
High grade high alloy HSS substrate material.

Cobalt high speed steel
Cobalt high speed steel substrate material.

High speed steel
High speed steel substrate material.

SYMBOLS

COATING

SMART MIRACLE coating
New smooth and dense coating technology for high efficiency milling of difficult to cut materials.

CRN coating
Newly developed CrN coating for Copper Electrodes machining.

Violet coating
Increased tool life of 2-3 times more than TiN coated products.

DP coating
New generation coating suitable for a wide range of materials.

MIRACLE coating
The original Miracle (Al,Ti)N coating.
Also suitable for dry cutting.

(Al, Ti)N coating
(Al,Ti)N highly versatile application range.

(Al,Ti,Cr)N multi-layer coating
For carbon, alloy and hardened steels.

IMPACT MIRACLE coating
Single phase nano crystal coating technology has higher film hardness and heat resistance.

MIRACLE coating
The original MIRACLE (Al,Ti)N coating.
Also suitable for dry cutting.

VFR coating
The (AlCrSi)N/(AlTiSti)N PVD multilayer coating is ideal for machining of extremely hard materials up to 70 HRC.

DLC coating
Hardness similar to CVD diamond coating achieved with high adhesion strength.

Diamond coating
Suitable for CFRP and CFRP-aluminium materials.

Diamond coating
Suitable for graphite machining.

Diamond coating
The original CVD diamond coating.

CVD Diamond coating
Unique multi-layer micro-grain diamond crystal control technology drastically improves wear resistance and smoothness.

CUTTING EDGE PROPERTIES

Sharp corner edge
Indicates the end mill has a sharp corner edge.

Gash land
Indicates the end mill cutting edge has a protective chamfer.

Rake angle

Helix angle
Indicates the helix angle of the end mill.

Point angle
Indicates the drill point angle.

Roughing flute geometry

Variable helix

Rounded gash

Corner angle

WEB THINNING

X type point geometry
X web thinning used at the drill point.

XR type point geometry
XR web thinning used at the drill point.

S type point geometry
Easy cutting geometry.

N type point geometry
Effective when the point web is thick.

Chipbreaker

SYMBOLS

TOLERANCES	
	**Tolerance of taper angle** Indicates the tolerance of the taper angle.
	**R tolerance** Indicates the radial tolerance of a ball nose end mill.
	**R tolerance** Indicates the radial tolerance of the corner radius.
	**R tolerance** Indicates the radial tolerance of a cutter with a corner radius.
	**Outside diameter tolerance** Indicates the diameter tolerance of the end mill.
	**Peak tolerance** Indicates the tolerance for the end diameter.
	**Shank diameter tolerance**
	**Shank diameter tolerance**
	**Drill tolerance / diameter**
COOLANT HOLES	
	**External coolant**
	**Internal coolant**
	**Internal coolant**
	**Centered, internal coolant hole**
	**Radial, internal coolant holes**
	**Internal coolant holes**
	**Internal coolant holes**

MEMO

MEMO

MEMO

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