



MFSE45

High Precision High Rake Milling



304 0.46 μ mRa

Rough and Finish in a Single Pass with Excellent Surface Finish

Roughing Condition ($f_z = 0.010$ ipt) Provides Excellent Surface Finish (0.8 μ mRa or Less) *

Maintains Long Tool Life with High-Precision Inserts

Newly Developed Chipbreakers for Steel, Stainless Steel, and Aluminum

Improved Productivity with Excellent Chip Control



*Based on internal evaluation with wiper insert installed.

MFSE45

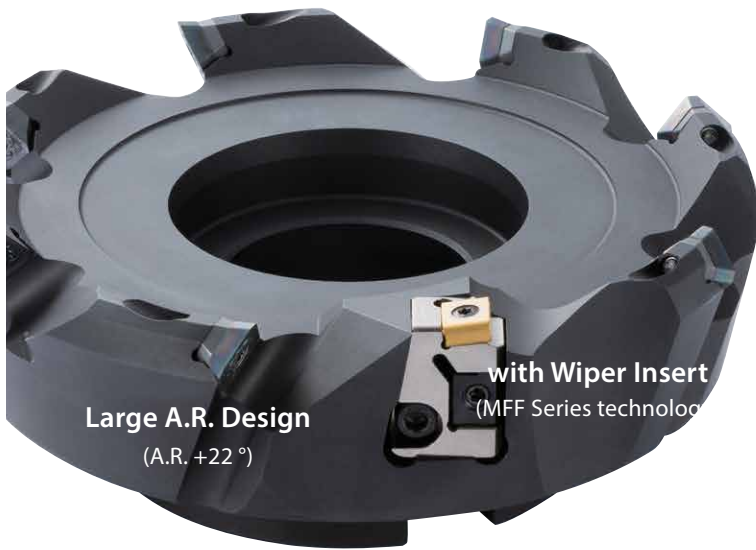
High Precision High Rake Milling

Rough and Finish in a Single Pass with Excellent Surface Finish

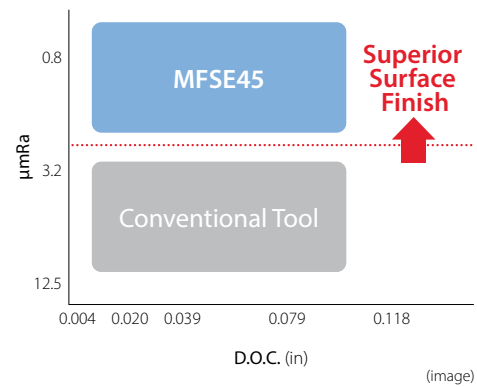
Roughing Condition ($fz = 0.010$ ipt) Provides Excellent Surface Finish ($0.8 \mu\text{mRa}$ or Less)

1 The MFSE45 Milling Solution

Delivers high-quality surfaces by roughing and finishing simultaneously



MFSE45 (Value)

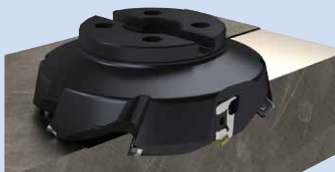


Machining Comparison Simulation (Example)

MFSE45 1 Pass and cutting time was cut by 1/3, with a good surface finish ($0.8 \mu\text{mRa}$ or less)

$fz = 0.010$ ipt (D.O.C. = 0.039")

Cutting Conditions: $V_c = 980$ sfm, Dry 1049 (Internal evaluation)



Cutting Time **Roughing + Finishing**

0.24µmRa

SOLUTION

1 Pass

Time = 1/3

Surface Finish ✓

Conventional Machining

Two separate passes for roughing and finishing
Cutting time is longer due to low feed rates during finishing

$fz = 0.006$ ipt (D.O.C. = 0.032")

$fz = 0.005$ ipt (D.O.C. = 0.008")



Cutting Time **Roughing**



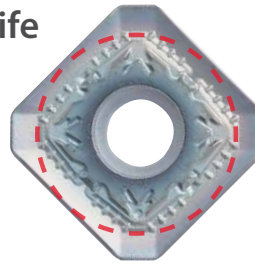
Finishing

CG image

2 Excellent Surface Finish and Long Tool Life

Tight I.C. tolerance of insert

Improved surface finish quality and longer tool life with reducing front edge runout



Inscribed Circle Tolerance
± 0.0008" or Less

(Class E Standard ± 0.0012" or less)

Excellent Front Edge Runout Accuracy



Runout Effects when Machining

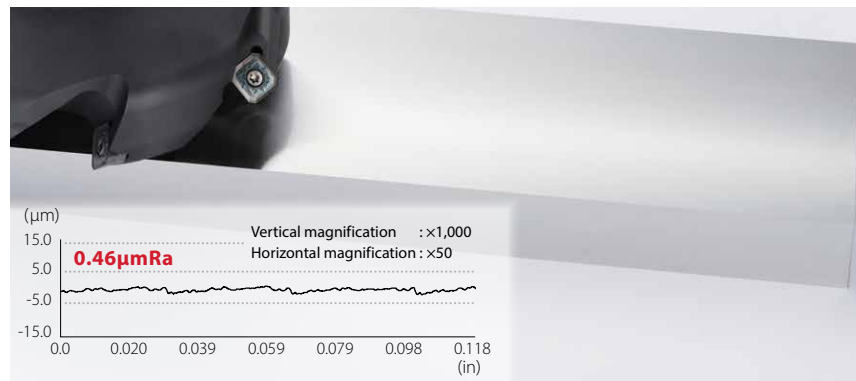
Advantage 1 Theoretical reduction of roughness on finished surface, excellent surface roughness

Effect on surface finish (Image)



Front Edge Runout: Small ⇒
Surface Roughness: Good

Surface roughness in stainless steel machining (Internal evaluation)



Cutting Conditions : Vc = 820 sfm, D.O.C. x ae = 0.039" x 3.937", fz = 0.006 ipt, Wet 304 Ø125mm (Standard 6 flutes) SL Chipbreaker

Advantage 2 Insert wear progresses evenly and tool life can be improved

Effect on wear (User Evaluation)

Average corner examples

Heavily damaged corner examples

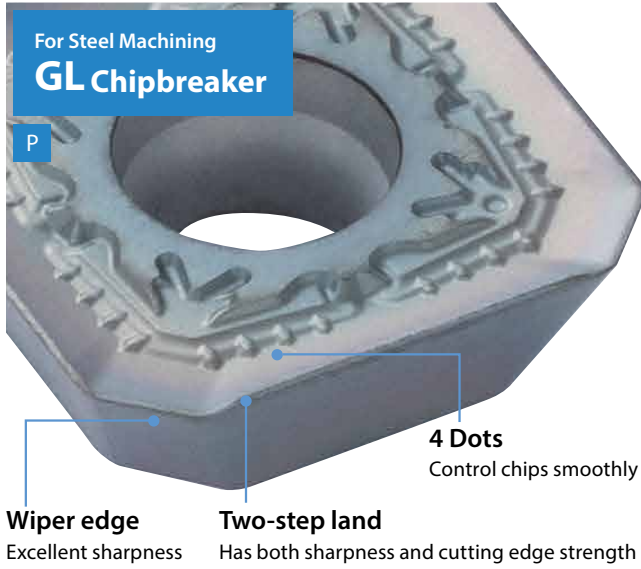
MFSE45			Variation : Small
Competitor A			Variation : Large

Cutting Conditions : Vc = 890 sfm, D.O.C. = ~ 0.059", fz = 0.008 ipt, Wet SS 400 Ø250mm (15 flutes) SL Chipbreaker (PR1535)

Due to the high wear rate of the insert, all inserts need to be replaced, which may result in shorter tool life.

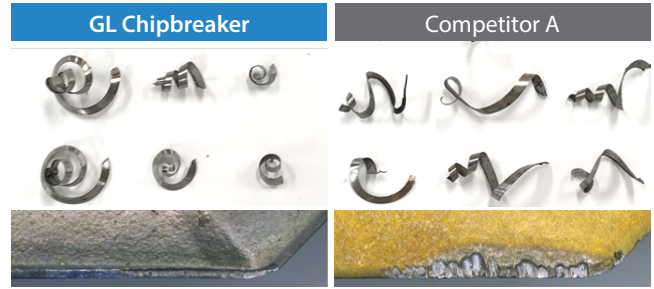
3 Kyocera's Newly Developed Unique Molded Chipbreaker

Excellent chip control. Eliminates chip entanglement in jigs, etc. and improves work efficiency



Delivers excellent chip evacuation, sharpness, strength and machining accuracy

Chip control and cutting edge condition comparison (Internal evaluation)



Cutting Conditions : Vc = 980 sfm, D.O.C. = 0.039"-0.059", fz = 0.008 ipt SS400 Ø100mm (15 Flutes)

Stainless Steel and Aluminum Machining	For Stainless Steel Machining SL Chipbreaker		For Aluminum Machining AL Chipbreaker	
	M Micro-honing		N Sharp Edge	

4 Various Holders Available for Multiple Applications

In addition to styles with a wiper insert, the standard type with only the standard inserts are also available

Toolholder Specifications

Type	With Wiper Insert 	Standard 
Surface roughness	Approx. 0.8µmRa	Approx. 1.6µmRa
Recommended feed	fz = 0.010 ipt	fz = 0.005 ipt (Finish machining time)
Application	High efficiency finishing 	General purpose (Uses 1 insert style)



Using wiper insert for MFF
(Cutting edge adjustment mechanism)

Note) See page 7 for details on how to adjust the cutting edge.



*Standard type only (Bore Dia. inch spec, Ø160mm ~)

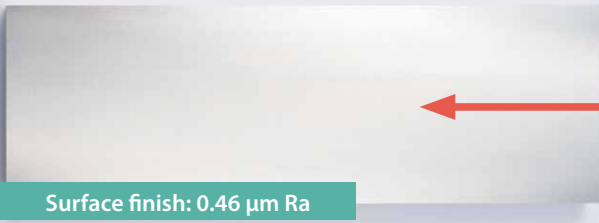
MFSE45

Delivers Excellent Results

*Based on internal evaluation

Surface Finish

304 / Excellent Surface Finish



Surface finish: 0.46 μ m Ra

Ø125mm
SEET13T3AGSN-SL PR1535
Vc = 820 sfm, D.O.C. = 0.008"
fz = 0.006 ipt, 304 Wet BT50

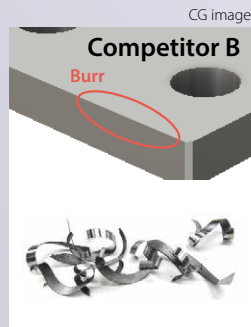


Excellent glossy finish even under high feed rates machining stainless steel

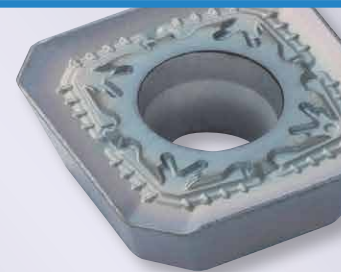
*User evaluation

Burrs and Chips

SS400 Rail / Reduced Machining Down-time



Ø100mm (Left hand)
SEET13T3AGSN-GL PR1535
Vc = 980 sfm, D.O.C. = 0.059"
fz = 0.008 ipt A36 Wet BT50



Reduces down-time and reduces burrs. Excellent chip control and extended automatic continuous operation time

*User evaluation

Strain

SUS 630 Equivalent Plate / Strain and Chatter Suppression

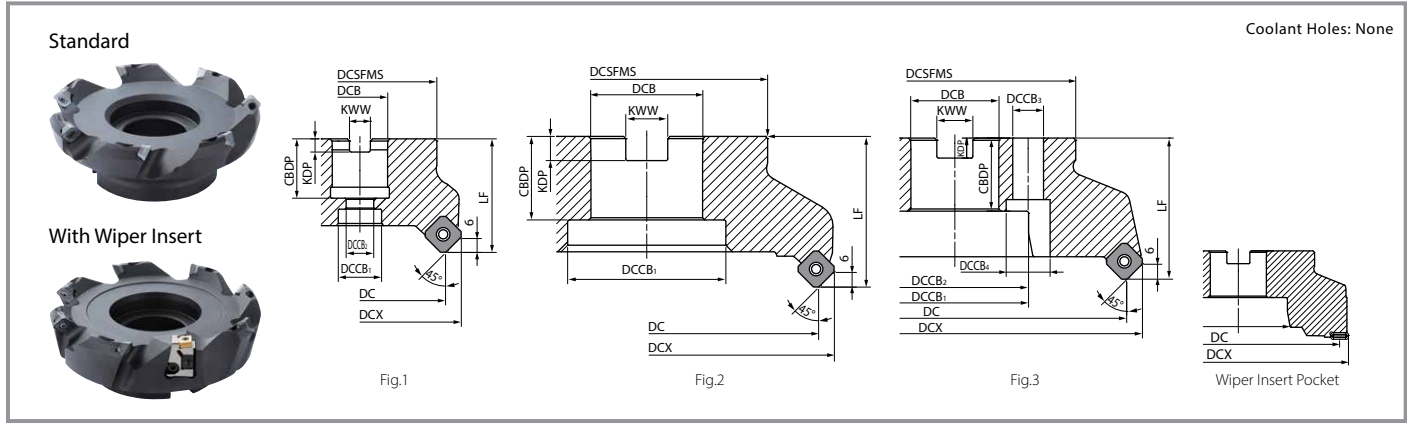


Ø63mm
SEET13T3AGSN-SL PR1535
Vc = 390 sfm, D.O.C. = 0.012"
fz = 0.003 ipt, Equivalent to S17400 Wet BT40



Reducing chatter by suppressing strain in stainless steel plate machining with a total length of 3.28 ft or more

Coolant Holes: None



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)											Cartridge	Drawing	Weight (kg)	Max. Revolution (RPM)				
			DC	DCX	DCB	DCSFMS	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	LF	CBDP	KDP					KWW			
Standard Inch Bore Dia.	MFSE 45080R-5T	●	5	80	88.7	1.000"	70	20	13	-	-	50	1.063"	0.236"	0.375"	No	Fig.1	1.4	12,800		
	45100R-5T	●	5	100	108.7	1.250"	78	48	-	-	50	1.260"	0.315"	0.500"	Fig.2		1.9	11,500			
	45125R-6T	●	6	125	133.7	1.500"	89	55	-	-	-	63	1.496"	0.394"	0.625"		Fig.2	3.3	10,200		
	45160 ³ / ₄ -7T	●	7	160	168.7	2.000"	110	72	-	-	-	63	1.496"	0.433"	0.750"		Fig.2	5.3	9,000		
	45200 ³ / ₄ -8T	●	8	200	208.7	-	142	100	-	18	26	63	1.575"	0.551"	1.000"		Fig.3	7.3	8,100		
	45250 ³ / ₄ -10T	●	10	250	258.7	1.875"	222	110	-	18	26	63	1.575"	0.551"	1.000"		Fig.3	15.8	7,200		
	Standard Metric Bore Dia.	MFSE 45063R-5T-M	●	5	63	71.7	22	48	-	5	-	-	50	21	6.3		10.4	No	Fig.1	0.6	14,400
		45080R-5T-M	●	5	80	88.7	27	70	-	5	-	-	50	24	7		12.4		Fig.1	1.4	12,800
		45100R-5T-M	●	5	100	108.7	32	78	-	5	-	-	50	30	8		14.4		Fig.2	1.8	11,500
		45125R-6T-M	●	6	125	133.7	40	89	-	6	-	-	63	33	9		16.4		Fig.2	3.2	10,200
45160R-7T-M		●	7	160	168.7	40	110	-	7	14	20	63	32	9	16.4	Fig.3	5.4		9,000		
45200R-8T-M		●	8	200	208.7	60	142	-	8	18	26	63	40	14	25.7	Fig.3	7.0		8,100		
45250R-10T-M	●	10	250	258.7	60	222	-	10	18	26	63	40	14	25.7	Fig.3	15.5	7,200				
Wiper Insert Inch Bore Dia.	MFSE 45160R-8T-W	●	8	160	168.7	2.000"	102	72	-	-	-	63	1.496"	0.433"	0.750"	Yes	Fig.2	5.5	1,000		
	45200R-9T-W	●	9	200	208.7	-	142	133	-	18	26	63	1.575"	0.551"	1.000"	(Wiper Insert Only)	Fig.3	7.6	800		
	45250R-11T-W	●	11	250	258.7	1.875"	222	133	-	18	26	63	1.496"	0.551"	1.000"	(Wiper Insert Only)	Fig.3	12.3	800		
	Wiper Insert Metric Bore Dia.	MFSE 45160R-8T-W-M	●	8	160	168.7	40	110	1	8	-	-	63	33	9	16.4	Yes	Fig.3	5.5	1,000	
		45200R-9T-W-M	●	9	200	212.8	60	142	1	9	18	26	63	40	14	25.7	(Wiper Insert Only)		7.3	800	
		45250R-11T-W-M	●	11	250	262.7	60	222	1	11	18	26	63	38	14	25.7	(Wiper Insert Only)		12.0	800	

Caution with Max. Revolution

Set the number of revolutions per minute within the recommended cutting speed on P8
When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.

● : Standard Item

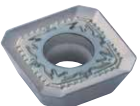
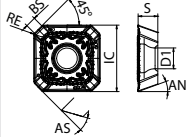
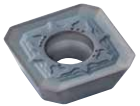
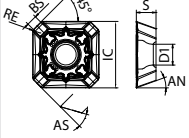
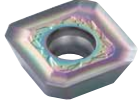
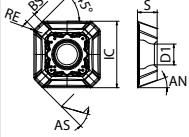
Common for Standard/Wiper Insert

Clamp Screw	Wrench	Shim	Shim Screw	Shim Wrench	Anti-seize Compound
SB-35120TRP	DTPM-15	MFSE-105	SPW-5035	LW-3.5	P-37
Fastening Torque for Insert Clamp 4 Nm		Fastening Torque for Shim Clamp 5 Nm			

For Wiper Insert


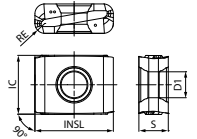

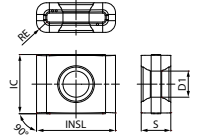
Clamp Screw	Wrench	Wedge	Cartridge	Cartridge Clamp Screw	Wrench	Adjustment Screw
SB-3592TR	DTM-10	AD-MFF	CR-MFF	HH5X15L	TTW-15	W6X18N
Fastening Torque for Wiper Insert Clamp 1.2 Nm						

Applicable Inserts

Usage Classification		P	Carbon Steel • Alloy Steel		★	☆	★	☆	☆						
			★	☆							★	☆			
★ : 1st Choice ☆ : 2nd Choice		M	Austenitic Stainless Steel		★	☆	★	☆	☆						
			Martensitic Stainless Steel		★	☆	☆	☆	★						
		K		Gray Cast Iron				☆	☆	★					
				Nodular Cast Iron		☆	☆	☆	☆	★					
		N		Non-ferrous Material							★				
		S		Heat Resistant Alloy				☆		★					
		Titanium Alloy				★									
Insert	Part Number	Dimensions (mm)					Angle		MEGACOAT NANO EX		MEGACOAT NANO		CVD Coating	DLC Coating	
		IC	S	D1	RE	BS	AN	AS	PR1835	PR1825	PR1535	PR1525	CA6535	PDL025	
		SEET 13T3AGSN-GL	13.4	3.97	4.2	1.5	2.1	20°	29°	●	●	●	●	●	
		SEET 13T3AGSN-SL	13.4	3.97	4.2	1.5	2.1	20°	29°	●	●	●	●	●	
		SEET 13T3AGFN-AL	13.4	3.97	4.2	1.5	2.1	20°	29°						●

● : Standard Item

Wiper Insert

Insert	Part Number	Dimensions (mm)					MEGACOAT NANO Cermet	MEGACOAT NANO	
		IC	S	D1	INSL	RE	PV60M	PR1525	
 For Steel and Stainless (Low Cutting Force)		LNGX 120916R-TT	9.525	4.76	4.2	12.7	1.6	●	●
 For Cast Iron		LNGX 120916	9.525	4.76	4.2	12.7	1.6	●	●

● : Standard Item

Cutting Edge Adjustment

1. Use the supplied TTW-15 wrench to rotate the screw and easily adjust the cutting edge position.

2. Thread in one direction clockwise (Fig.1) when adjusting.

If the adjustment is completed with the screw rotated counterclockwise, the screw will become loose and chatter due to backlash.

*Since the insert cutting edge of this product has an arc shape, it cannot be adjusted correctly if the measurement position is different.

3. To adjust, start with the screw turned counterclockwise about two rotations (lowering the cutting edge).

Tighten the screws clockwise (raising the cutting edge) until the insert with the highest edge (Fig. 2) catches 60 μm. (Fig. 3)

*Use a dial gauge to measure protrusion amount.

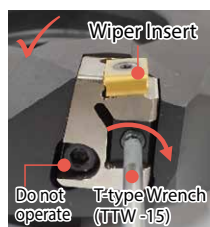


Fig. 1 Adjustment Direction



Fig. 2

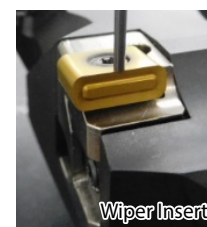


Fig. 3

Recommended Cutting Conditions

Chipbreaker	Workpiece Material	fz (ipt)	Recommended Insert Grade (Cutting Speed Vc: sfm)					
			MEGACOAT NANO EX		MEGACOAT NANO		CVD Coated Carbide	DLC (Coated Carbide)
			PR1825	PR1835	PR1535	PR1525	CA6535	PDL025
GL	Carbon Steel	0.004 ~ 0.006 ~ 0.012	☆ 490 ~ 660 ~ 980	★ 490 ~ 660 ~ 980	★ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	-
	Alloy Steel	0.004 ~ 0.006 ~ 0.012	☆ 490 ~ 660 ~ 980	★ 490 ~ 660 ~ 980	★ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	-
	Mold Steel	0.004 ~ 0.006 ~ 0.010	★ 330 ~ 490 ~ 820	☆ 330 ~ 490 ~ 820	☆ 330 ~ 490 ~ 820	★ 330 ~ 490 ~ 820	☆ 330 ~ 490 ~ 820	-
	Austenitic Stainless Steel*	0.004 ~ 0.006 ~ 0.010	☆ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	-
	Martensitic Stainless Steel*	0.004 ~ 0.006 ~ 0.010	☆ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	-
	Gray Cast Iron	0.004 ~ 0.006 ~ 0.010	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	-
	Nodular Cast Iron	0.004 ~ 0.006 ~ 0.010	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	-
SL	Carbon Steel	0.004 ~ 0.005 ~ 0.006	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	-
	Alloy Steel	0.004 ~ 0.005 ~ 0.006	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	☆ 490 ~ 660 ~ 980	-
	Mold Steel	-	-	-	-	-	-	-
	Austenitic Stainless Steel*	0.004 ~ 0.006 ~ 0.008	☆ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	-
	Martensitic Stainless Steel*	0.004 ~ 0.006 ~ 0.008	☆ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	★ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	☆ 330 ~ 660 ~ 820	-
AL	Aluminum Alloy (Si 13% or less)	0.004 ~ 0.006 ~ 0.012	-	-	-	-	-	★ 660 ~ 1,310 ~ 1,640

*Machining with coolant is recommended for stainless steel machining.

★: 1st Recommendation ☆: 2nd Recommendation

Bold text in the table indicates recommended values. Adjust the cutting speed and feed within the above conditions according to the actual machining situation.



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