KYOCERA

High precision and efficient high rake cutter | MFSE45

MFSE45

NEW

Roughing and finishing in one pass with excellent surface finish

Roughing condition (fz=0.25 mm) provides excellent surface finish (0.8 µm Ra 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

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High precision and efficient high rake cutter

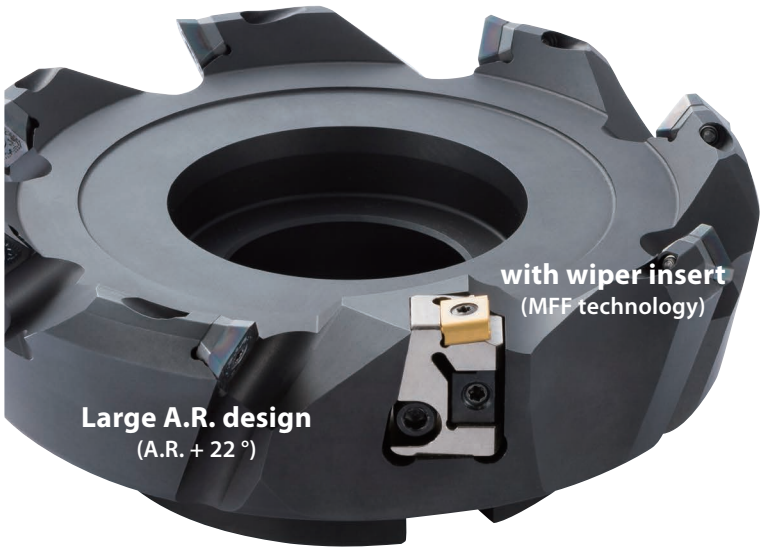
MFSE45

Roughing and finishing in one pass with excellent surface finish

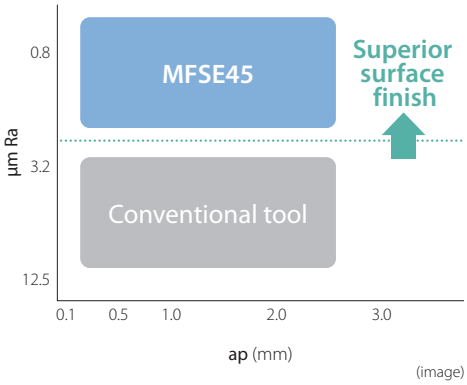
Roughing condition (fz = 0.25 mm/t) provides excellent surface finish (0.8 µm Ra or less) *

1 The MFSE45 milling solution

Delivers high-quality surfaces by roughing and finishing simultaneously



MFSE45 (VALUE)

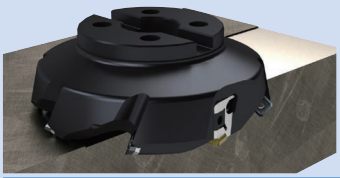


(image)

Machining comparison simulation (Example)

MFSE45 One pass and cutting time was cut by 1/3, with a good surface finish (0.8 µm Ra or less)

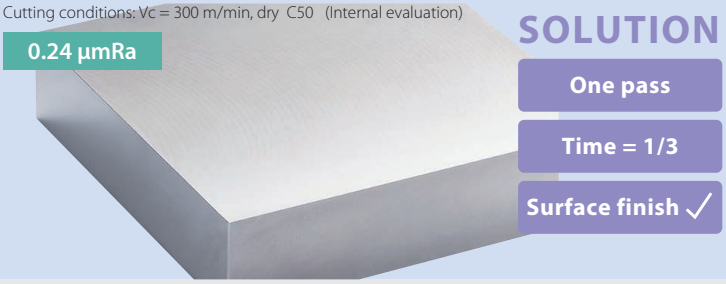
fz = 0.25 mm/t (ap = 1.0 mm)



ø 160 -8T GL Chipbreaker
(with wiper insert)

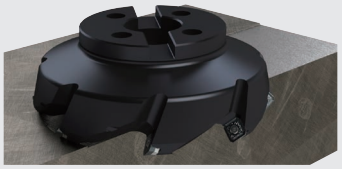
Cutting time **Roughing + Finishing**

Cutting conditions: Vc = 300 m/min, dry C50 (Internal evaluation)



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

fz = 0.15 mm/t (ap = 0.8 mm)



ø160-8T

fz = 0.125 mm/t (ap = 0.2 mm)

ø160-8T

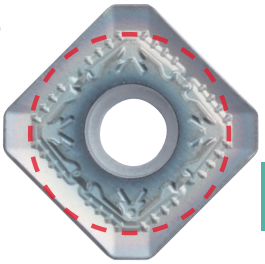
Cutting time **Roughing** **Finishing**

CG image

2 Excellent surface finish and long tool life

Strict control of insert inscribed circle tolerance

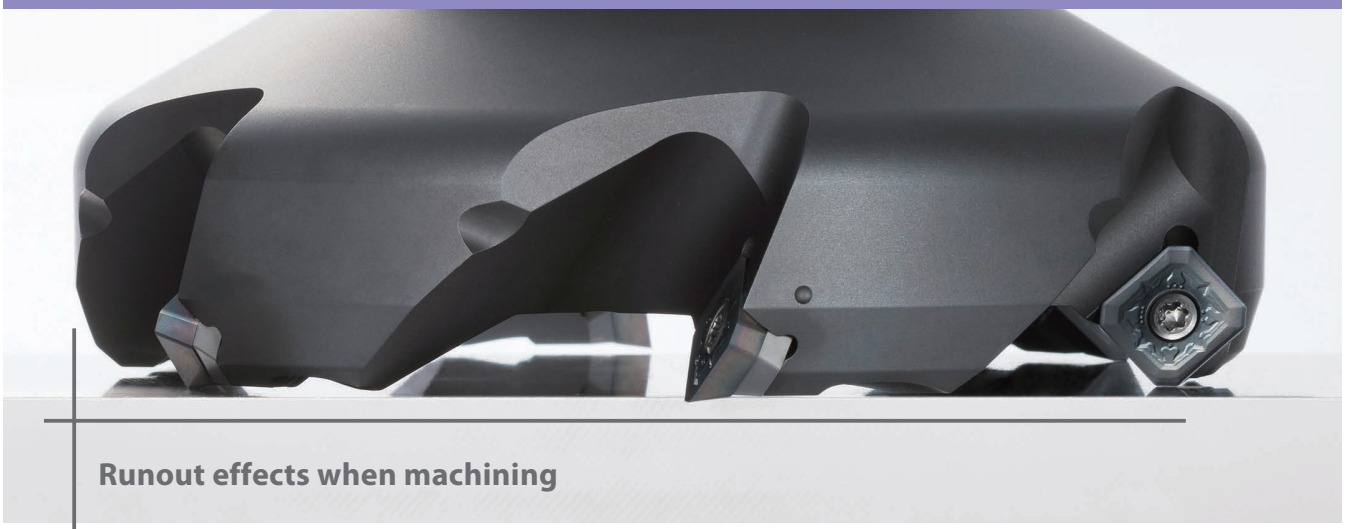
Improved surface finish quality and longer tool life with reducing front edge runout



Inscribed circle tolerance
± 0.015 mm or less

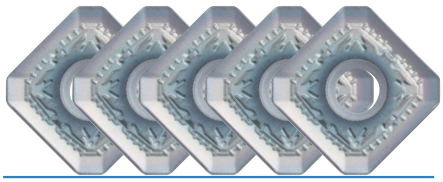
(Class E Standard ± 0.025 mm or less)

Excellent front edge runout accuracy



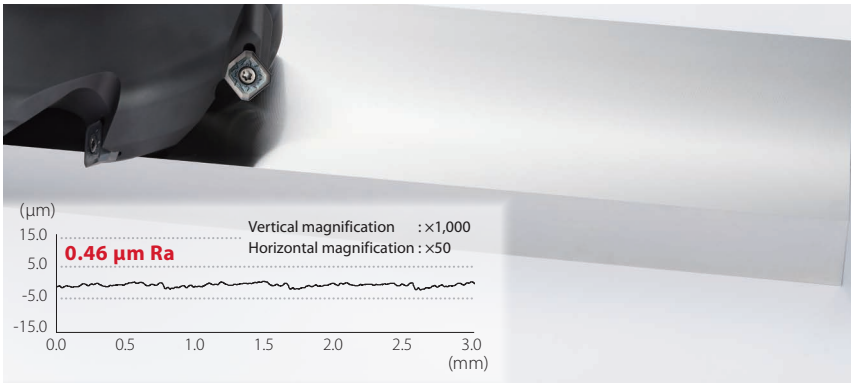
Advantage ① Theoretical reduction of roughness on finished surface, excellent surface roughness

Effect on surface finish
(Image)



Front edge runout: Small ⇒
Surface roughness: Good

Surface roughness in stainless steel machining (Internal evaluation)



Cutting conditions : Vc = 250 m/min, ap x ae = 1.0 x 100 mm, fz = 0.15 mm/t, wet X5CrNi18-10 ø 125 (Standard 6 inserts) SL Chipbreaker

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

Effect on wear (User evaluation)

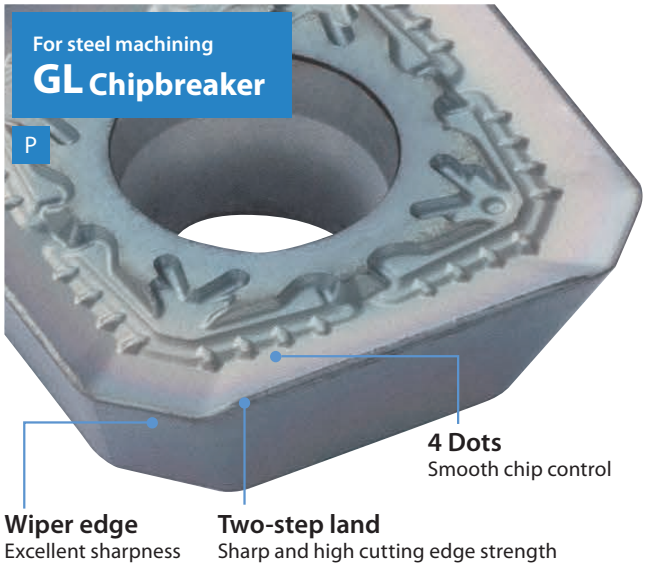
	Average corner examples	Heavily damaged corner examples	
MFSE45	 Wear : 0.145 mm	 Wear : 0.172 mm	Variation: Small
Competitor A	 Wear : 0.105 mm	 Wear : 0.911 mm	Variation: Large

Cutting conditions : Vc = 270 m/min, ap = ~ 1.5 mm, fz = 0.2 mm/t, Wet St 44-2 ø 250 (15 inserts) 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.

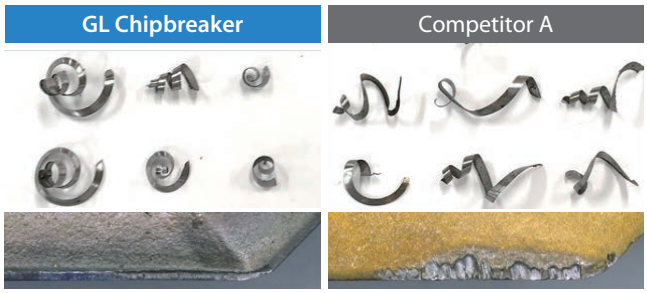
3 Kyocera's newly developed unique molded chipbreaker

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)

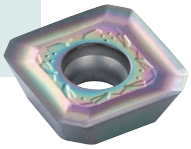


Cutting conditions : Vc = 300 m/min , ap = 1.0 -1.5 mm , fz = 0.2 mm/t,
St 44-2 ø 100 (15 Flutes)

Available for stainless steel and aluminum machining

For stainless steel machining
SL Chipbreaker
M
Micro-honing

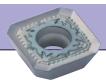
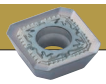
For aluminum machining
AL Chipbreaker
N
Sharp edge

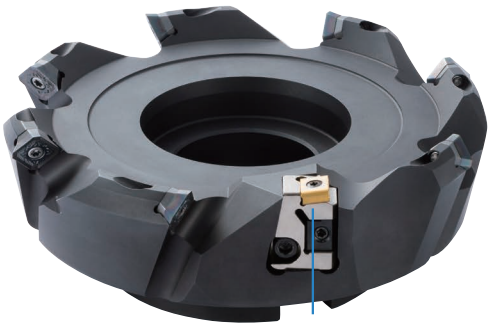


4 Various holders available for multiple applications

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. 0.8 µm Ra	Approx. 1.6 µm Ra
Recommended feed	fz = 0.25 mm/t 	fz = 0.12 mm/t (Finish machining time)
Application	High efficiency finishing	General purpose (Uses 1 insert style)



Using wiper insert for MFF
(Cutting edge adjustment mechanism with excellent operability)

Note: See page 6 for details on how to adjust the cutting edge.

CG image

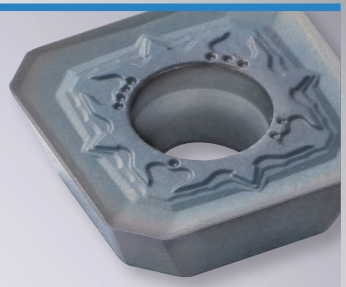
*Standard type only (Bore Dia. inch spec, ø 160 ~)

MFSE45
for excellent results

*Based on internal evaluation

Surface finish

X5CrNi18-10 / Excellent surface finish



ø125
SEET13T3AGSN-SL PR1535
Vc = 250 m/min, ap = 0.2 mm
fz = 0.15 mm/t, X5CrNi18-10 Wet BT50

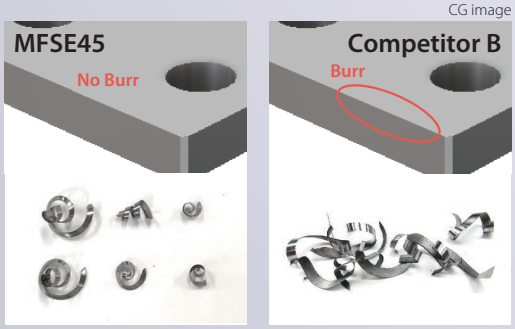
Excellent glossy finish even under high feed rates machining stainless steel

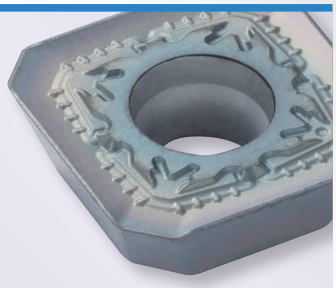
*User evaluation

Burrs and chips

St 44-2 Rail / Reduced machining down-time

CG image





ø 100 (Left hand)
SEET13T3AGSN-GL PR1535
Vc = 300 m/min, ap = 1.5 mm
fz = 0.2 mm/t, St 44-2 Wet BT50

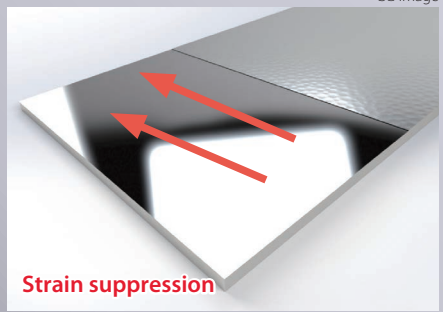
Reduces down-time and reduces burr. Excellent chip control and extended automatic continuous operation time

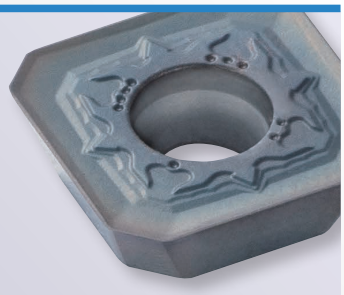
*User evaluation

Strain

X5CrNiCuNb16-4 Equivalent plate / Strain and chatter suppression

CG image





ø63
SEET13T3AGSN-SL PR1535
Vc = 120 m/min, ap = 0.3 mm
fz = 0.08 mm/t, Equivalent to X5CrNiCuNb16-4 Wet BT40

Reducing chatter by suppressing strain in stainless steel plate machining with a total length of 1 m or more

MFSE45

Coolant holes: None

Standard

With wiper insert

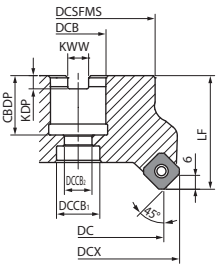


Fig.1

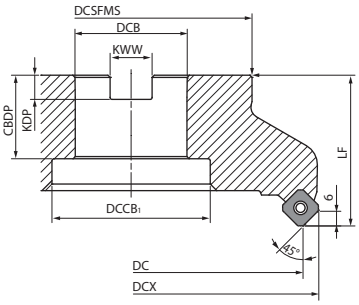


Fig.2

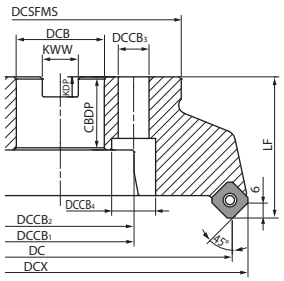
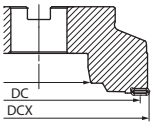


Fig.3



Wiper insert pocket

Toolholder dimensions

	Description	Availability	No. of inserts	Dimensions (mm)											Cartridge	Shape	Weight (kg)	Max. revolution (min^{-1})
				DC	DCX	DCB	DCB_1	DCB_2	DCB_3	DCB_4	LF	CBDP	KDP	KWW				
Standard	MFSE45063R-5T-M	MTO	5	63	71.7	22	-	5	-	-	50	21	6.3	10.4	No	Fig.1	0.6	14,400
	MFSE45080R-5T-M	MTO	5	80	88.7	27	-	5	-	-		24	7	12.4			1.4	12,800
	MFSE45100R-5T-M	MTO	5	100	108.7	32	-	5	-	-		30	8	14.4		Fig.2	1.8	11,500
	MFSE45125R-6T-M	MTO	6	125	133.7	40	-	6	-	-	63	33	9	16.4			3.2	10,200
	MFSE45160R-7T-M	MTO	7	160	168.7	40	-	7	14	20		32	9	16.4			5.4	9,000
	MFSE45200R-8T-M	MTO	8	200	208.7	60	-	8	18	26		40	14	25.7		Fig.3	7.0	8,100
	MFSE45250R-10T-M	MTO	10	250	258.7		-	10	18	26		40	14	25.7			15.5	7,200
Wiper insert	MFSE45160R-8T-W-M	MTO	8	160	168.7	40	1	8	-	-	63	33	9	16.4	Yes (Wiper insert only)	Fig.3	5.5	1,000
	MFSE45200R-9T-W-M	MTO	9	200	212.8	60	1	9	18	26		40	14	25.7			7.3	800
	MFSE45250R-11T-W-M	MTO	11	250	262.7		1	11	18	26		38	14	25.7			12.0	800

Maximum number of revolutions

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on the back cover.
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

MTO : Made to order

Parts

Common for standard/Wiper insert

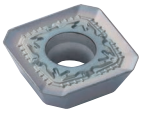
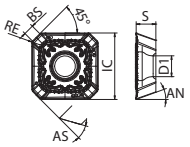
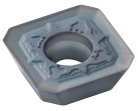
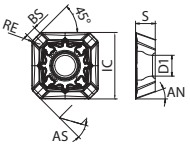
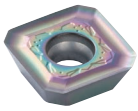
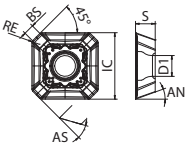
Clamp screw	Wrench	Shim	Shim screw	Shim wrench	Anti-seize compound
					
SB-35120TRP	DTPM-15	MFSE-105	SPW-5035	LW-3.5	P-37
Fastening torque for insert clamp 4 N・m		Fastening torque for shim clamp 5 N・m			

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 N・m						

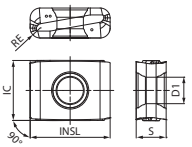
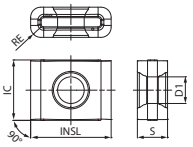
Applicable inserts

Usage classification							
★ : 1st choice ☆ : 2nd choice	P	Carbon steel /Alloy steel	★	☆	☆	
		Mold steel	☆	★	☆	
	M	Stainless steel	★	☆	☆	
		Stainless steel (Martensitic)	★	☆	☆	
	K	Gray cast iron	☆	☆	☆	
		Nodular cast iron	☆	☆	★	
	N	Non-ferrous metal				★
	S	Heat resistant alloy	☆			
		Titanium alloy	☆			

Shape		Description	Dimensions (mm)					Angle		MEGACOAT NANO		CVD coating	DLC coating
			IC	S	D1	RE	BS	AN	AS	PR1535	PR1525	CA6535	PDL025
		SEET13T3AGSN-GL	13.4	3.97	4.2	1.5	2.1	20°	29°	●	●	●	
		SEET13T3AGSN-SL	13.4	3.97	4.2	1.5	2.1	20°	29°	●	●	●	
		SEET13T3AGFN-AL	13.4	3.97	4.2	1.5	2.1	20°	29°				●

● : Available

Wiper insert

Shape		Description	Dimensions (mm)					MEGACOAT NANO Cermet	MEGACOAT NANO
			IC	S	D1	INSL	RE	PV60M	PR1525
 For steel and stainless steel (Low cutting force)		LNGX 120916R-TT	9.525	4.76	4.2	12.7	1.6	MTO	MTO
 For cast iron		LNGX 120916	9.525	4.76	4.2	12.7	1.6	MTO	MTO

MTO : Made to order

About 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.

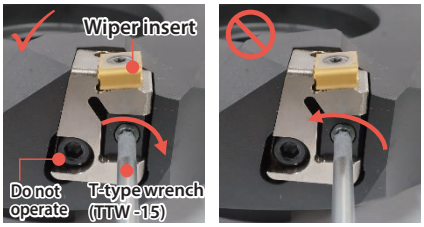


Fig. 1 Adjustment direction

Fig. 2

Fig. 3

Recommended cutting conditions ★: 1st Recommendation ☆: 2nd Recommendation

Chipbreaker	Workpiece	fz (mm/t)	Recommended insert grade (Cutting speed Vc: m/min)			
			PR1535	PR1525	CA6535	PDL025
GL	Carbon steel (S * * C, etc.)	0.1 - **0.15** - 0.3	★ 150 - **200** - 300	☆ 150 - **200** - 300	☆ 150 - **200** - 300	–
	Alloy steel (SCM, etc.)	0.1 - **0.15** - 0.3	★ 150 - **200** - 300	☆ 150 - **200** - 300	☆ 150 - **200** - 300	–
	Mold steel (SKD, etc.)	0.1 - **0.15** - 0.25	☆ 100 - **150** - 250	★ 100 - **150** - 250	☆ 100 - **150** - 250	–
	Austenitic stainless steel * (X5CrNi18-10, etc.)	0.1 - **0.15** - 0.25	★ 100 - **200** - 250	☆ 100 - **200** - 250	☆ 100 - **200** - 250	–
	Martensitic stainless steel * (X6Cr13, etc.)	0.1 - **0.15** - 0.25	★ 100 - **200** - 250	☆ 100 - **200** - 250	☆ 100 - **200** - 250	–
	Gray cast iron (FC)	0.1 - **0.15** - 0.25	☆ 100 - **200** - 250	☆ 100 - **200** - 250	☆ 100 - **200** - 250	–
	Nodular cast iron (FCD)	0.1 - **0.15** - 0.25	☆ 100 - **200** - 250	☆ 100 - **200** - 250	★ 100 - **200** - 250	–
SL	Carbon steel (S * * C, etc.)	0.1 - **0.12** - 0.15	☆ 150 - **200** - 300	☆ 150 - **200** - 300	☆ 150 - **200** - 300	–
	Alloy steel (SCM, etc.)	0.1 - **0.12** - 0.15	☆ 150 - **200** - 300	☆ 150 - **200** - 300	☆ 150 - **200** - 300	–
	Mold steel (SKD, etc.)	–	–	–	–	–
	Austenitic stainless steel * (X5CrNi18-10, etc.)	0.1 - **0.15** - 0.2	★ 100 - **200** - 250	☆ 100 - **200** - 250	☆ 100 - **200** - 250	–
	Martensitic stainless steel * (X6Cr13, etc.)	0.1 - **0.15** - 0.2	★ 100 - **200** - 250	☆ 100 - **200** - 250	☆ 100 - **200** - 250	–
AL	Aluminum alloy (Si 13% or less)	0.1 - **0.15** - 0.3	–	–	–	★ 200 - **400** - 500

*Machining with coolant is recommended for stainless steel machining.
Bold text in the table indicates recommended values. Adjust the cutting speed and feed within the above conditions according to the actual machining situation.

TZE00193