

Screw-on Insert type Face Milling Cutter

ASX445

New coated grades now included

Stable face milling under high-load conditions

Carbide shim anti fly insert mechanism.
Powerful cutting action for improved efficiency.
Cutter body resistant to high temperatures and corrosion.



Screw-on Insert type Face Milling Cutter

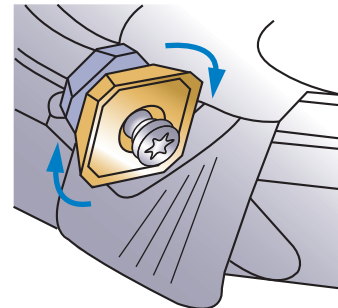
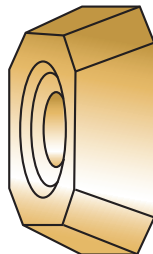
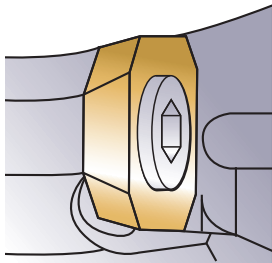
ASX445

Features

STABLE, LONG TOOL LIFE, HIGH ACCURACY BODY

A carbide shim with Mitsubishi's proprietary Anti-Fly Insert (AFI) mechanism provides excellent insert location characteristics, permitting stable cutting even under high load conditions.

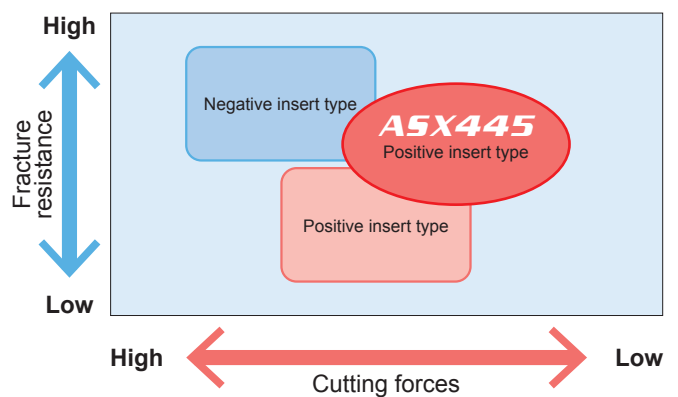
The ASX cutter uses screw-on type inserts that allow easy clamping of the inserts with high location precision. Indexing of the inserts can be performed without completely removing the screw.



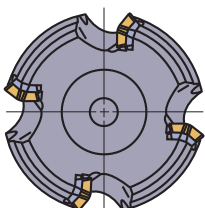
	Cutting forces	Fracture resistance	Cutting heat
ASX445	Low	Low	Low
Negative square insert type	High	High	High

ASX is a well-balanced cutter for positive insert type that improves fracture resistance and reduces cutting resistance.

Effective for when workpiece with small thickness is cut and when heat generation is needed to suppress because of low cutting resistance, and ideal for finish cutting.

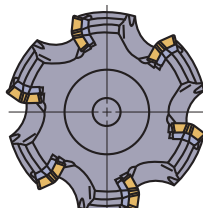


EFFECTIVE FOR VARIOUS MACHINING APPLICATIONS



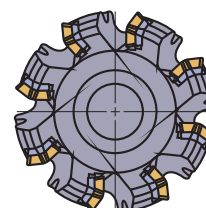
Coarse Pitch Type

- 1st recommendation for cutting steels and stainless steels.
- For deep cutting and high feed rates with large-volume chip discharge.
- Smooth cutting allows longer overhang applications.



Fine Pitch Type

- 1st recommendation for cast iron, hardened steel and heat-resistant alloys.
- For shallow cutting with low feed rates and low-volume chip discharge.



Extra Fine Pitch Type

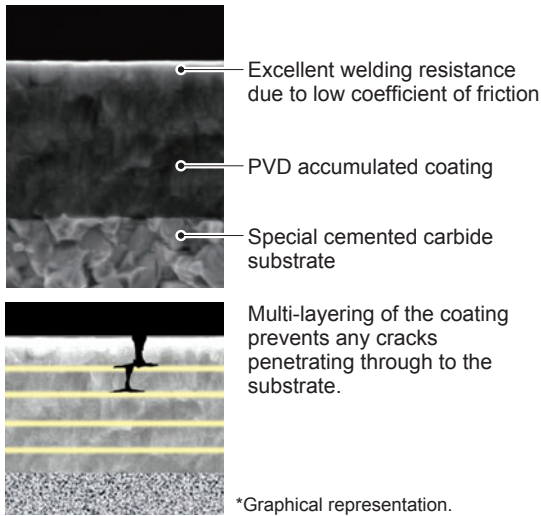
- 1st recommendation for cast iron.
- For cutting operations where chip discharge volume is small and high table feed is desired.

INSERT GRADES FOR A WIDE RANGE OF MATERIALS

NEW

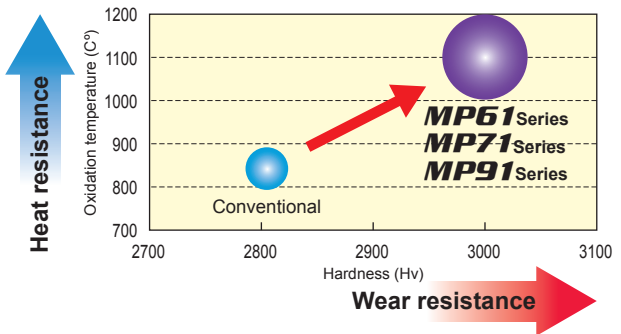
MP6100, MP7100, MP9100 - With accumulated Al-Ti-Cr-N based PVD coating

PVD coatings have properties such as toughness, low coefficient of friction and excellent welding, wear and heat resistance. This results in tough, precision grades such as MP6100, MP7100 and MP9100.

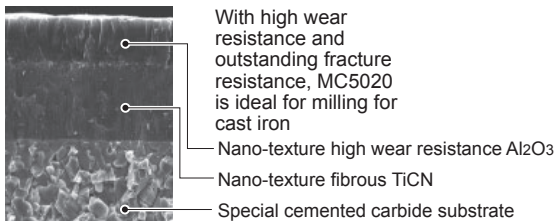


TOUGH-Σ Technology

A fusion of the separate coating technologies; PVD and multi-layering realises extra toughness.



Super diamond coated MC5020



Coefficient of friction

	Work Material	Grade	Coefficient of friction		
			Measured at 600 degrees		
			S55C	SUS304	Ti-6Al-4V
P	Carbon Steel, Alloy Steel	MP6100	0.4		
M	Stainless Steel	MP7100		0.5	
S	Titanium Alloy, Heat Resistant Alloy	MP9100			0.3
	Conventional		0.7	0.7	0.7

Due to low coefficient of friction compared to conventional products, thereby achieving excellent adhesion resistance.

Super diamond coated F7030

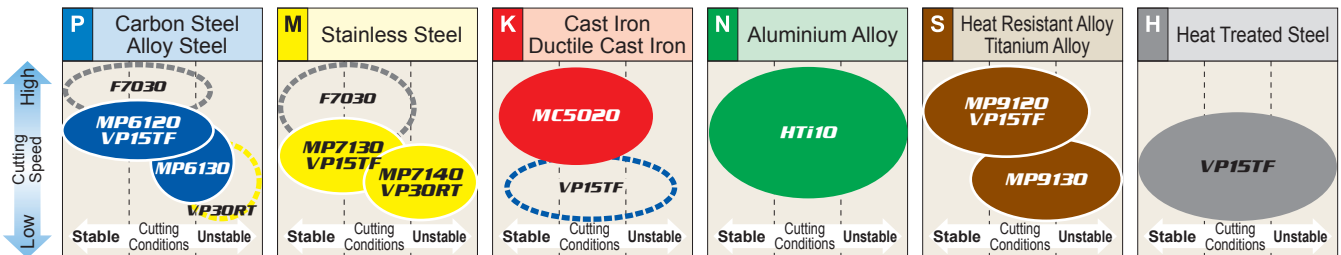
Enables high performance machining of both steel and stainless steels in both dry and wet cutting.

MIRACLE[®] coated VP15TF

Stable machining properties are enabled when the coating is combined with a high wear and fracture resistant carbide substrate.

MIRACLE[®] coated VP30RT

Ideal for heavy interrupted cutting of stainless and general steels because of the excellent fracture resistance properties.



(Note) When machining steel or stainless steel where the emphasis is on surface finish, use cermet grade NX4545.
 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

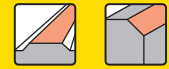
CHIPBREAKERS FOR A WIDE RANGE OF APPLICATIONS

JL Finish to Light cutting Breaker	JM Light to Semi-Heavy cutting Breaker	JH Medium to Heavy cutting Breaker	JP Aluminium alloy cutting Breaker	FT Rough cutting for cast iron Breaker
High accuracy insert with ground-finished periphery. Large rake angle leading to low cutting resistance.	High accuracy M class insert. For a wide range of workpiece materials and cutting conditions.	High accuracy M class insert. Strong cutting edge for high fracture resistance.	High accuracy insert with ground-finished periphery. Large rake angle and mirror-finished rake face for sharp cutting performance and high welding resistance.	High M class inserts. Higher fracture-resistant flat-top inserts.
①Workpiece rigidity is low.	①General cutting.	①Interrupted cutting. ②Scaling.	①General cutting of aluminium alloy.	①For rough accuracy machining of scaled cast iron.

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FACE MILLING

<GENERAL CUTTING>



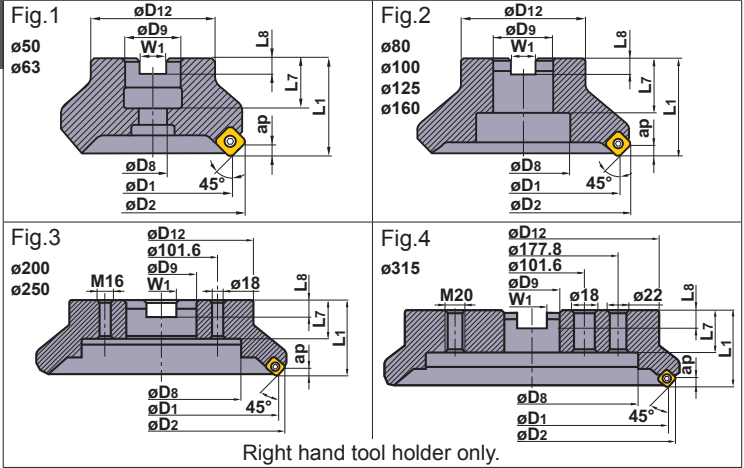
ASX445

P M K N S H



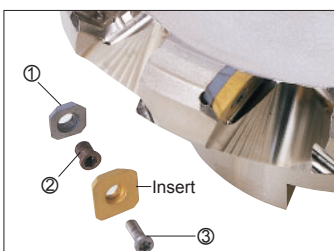
- Precision inexpensive moulded type 20° positive insert.
- Screw-on type.
- A wide range of chip breakers.
- High rigidity due to carbide shim.

CH: 45°
 A.R: +20° - +23° T: +4°49' - +9°53'
 R.R: -13° - -10° I: +22°55' - +23°02'



ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Tool Weight (kg)	Max. Depth of Cut ap (mm)	Type (Fig.)
				D1	D2	L1	D9	L7	D8	D12	W1	L8			
Coarse Pitch	ASX445-050A03R	●	3	50	63.0	40	22	20	11	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	50	10.4	6.3	0.7	6	1
	ASX445R08004C	●	4	80	93.2	50	25.4	26	38	56	9.5	6	1.1	6	2
	ASX445R10005D	●	5	100	113.2	50	31.75	32	45	70	12.7	8	1.8	6	2
	ASX445R12506E	●	6	125	138.0	63	38.1	35	60	80	15.9	10	2.9	6	2
	ASX445R16007F	●	7	160	173.0	63	50.8	38	80	100	19.1	11	4.7	6	2
	ASX445R20008K	●	8	200	212.9	63	47.625	35	140	175	25.4	14.22	7.9	6	3
	ASX445R25010K	●	10	250	262.9	63	47.625	35	180	220	25.4	14.22	12.9	6	3
	ASX445R31514P	●	14	315	327.9	63	47.625	40	245	285	25.4	14.22	22.4	6	4
Fine Pitch	ASX445-050A04R	●	4	50	63.0	40	22	20	11	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	50	10.4	6.3	0.6	6	1
	ASX445R08006C	●	6	80	93.2	50	25.4	26	38	56	9.5	6	1.0	6	2
	ASX445R10007D	●	7	100	113.2	50	31.75	32	45	70	12.7	8	1.7	6	2
	ASX445R12508E	●	8	125	138.0	63	38.1	35	60	80	15.9	10	2.8	6	2
	ASX445R16010F	●	10	160	173.0	63	50.8	38	80	100	19.1	11	4.6	6	2
	ASX445R20012K	●	12	200	212.9	63	47.625	35	140	175	25.4	14.22	7.8	6	3
	ASX445R25014K	●	14	250	262.9	63	47.625	35	180	220	25.4	14.22	12.8	6	3
	ASX445R31518P	●	18	315	327.9	63	47.625	40	245	285	25.4	14.22	22.2	6	4
Extra Fine Pitch	ASX445-050A05R	●	5	50	63.0	40	22	20	11	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	50	10.4	6.3	0.6	6	1
	ASX445R08008C	●	8	80	93.2	50	25.4	26	38	56	9.5	6	1.1	6	2
	ASX445R10010D	●	10	100	113.2	50	31.75	32	45	70	12.7	8	1.8	6	2
	ASX445R12512E	●	12	125	138.0	63	38.1	35	60	80	15.9	10	2.9	6	2
	ASX445R16016F	●	16	160	173.0	63	50.8	38	80	100	19.1	11	4.7	6	2
	ASX445R20020K	●	20	200	212.9	63	47.625	35	140	175	25.4	14.22	7.8	6	3
	ASX445R25024K	●	24	250	262.9	63	47.625	35	180	220	25.4	14.22	12.8	6	3
	ASX445R31528P	●	28	315	327.9	63	47.625	40	245	285	25.4	14.22	21.8	6	4



SPARE PARTS

Tool Holder Number	① Shim	② Shim Screw *	③ Clamp Screw *	Wrench (Insert)	Wrench (Shim)
ASX445	STASX445N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N · m) : WCS503507H=5.0, TPS35=3.5

● : Inventory maintained in Japan.

For metric arbors

The cutter bore diameter D₉ is indicated in millimetres.

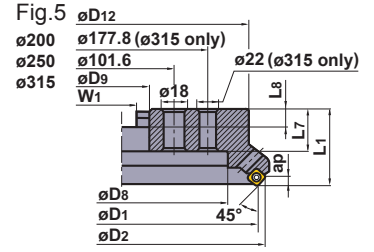
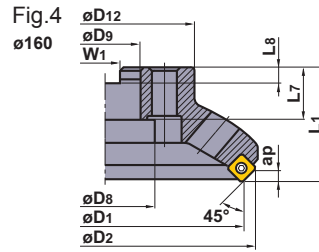
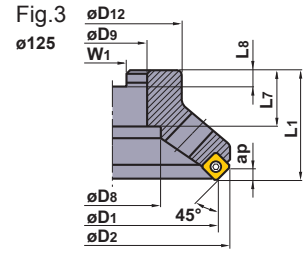
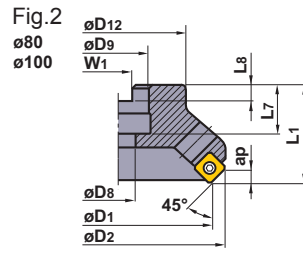
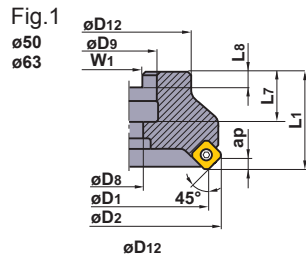


ø50, ø63



Over ø80

C H:45°
 A.R :+20°-+23° T :+4°49'-+9°53'
 R.R :-13°--10° I :+22°55'-+23°02'

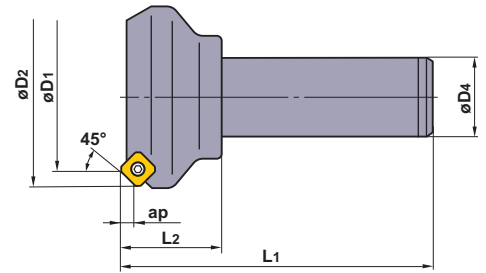
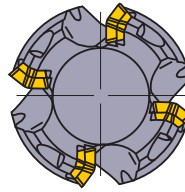


Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm)									Tool Weight (kg)	Max. Depth of Cut ap (mm)	Type (Fig.)
				D1	D2	L1	D ₉	L7	D ₈	D12	W1	L8			
Coarse Pitch	ASX445-050A03R	●	3	50	63.0	40	22	20	11	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	50	10.4	6.3	0.7	6	1
	ASX445-080A04R	●	4	80	93.2	50	27	23	13	56	12.4	7	1.0	6	2
	ASX445-100A05R	●	5	100	113.2	50	32	26	17	70	14.4	8	1.6	6	2
	ASX445-125B06R	●	6	125	138.0	63	40	32	56	80	16.4	9	2.4	6	3
	ASX445-160C07R	●	7	160	173.0	63	40	29	56	100	16.4	9	3.9	6	4
	ASX445-200C08R	●	8	200	212.9	63	60	32	135	155	25.7	14.22	6.7	6	5
	ASX445-250C10R	●	10	250	262.9	63	60	32	174	200	25.7	14.22	10.5	6	5
	ASX445-315C14R	●	14	315	327.9	80	60	57	256.8	285	25.7	14.22	22.4	6	5
Fine Pitch	ASX445-050A04R	●	4	50	63.0	40	22	20	11	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	50	10.4	6.3	0.6	6	1
	ASX445-080A06R	●	6	80	93.2	50	27	23	13	56	12.4	7	0.9	6	2
	ASX445-100A07R	●	7	100	113.2	50	32	26	17	70	14.4	8	1.5	6	2
	ASX445-125B08R	●	8	125	138.0	63	40	32	56	80	16.4	9	2.3	6	3
	ASX445-160C10R	●	10	160	173.0	63	40	29	56	100	16.4	9	3.6	6	4
	ASX445-200C12R	●	12	200	212.9	63	60	32	135	155	25.7	14.22	5.8	6	5
	ASX445-250C14R	●	14	250	262.9	63	60	32	174	200	25.7	14.22	10.6	6	5
	ASX445-315C18R	●	18	315	327.9	80	60	57	256.8	285	25.7	14.22	22.2	6	5
Extra Fine Pitch	ASX445-050A05R	●	5	50	63.0	40	22	20	11	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	50	10.4	6.3	0.6	6	1
	ASX445-080A08R	●	8	80	93.2	50	27	23	13	56	12.4	7	0.9	6	2
	ASX445-100A10R	●	10	100	113.2	50	32	26	17	70	14.4	8	1.5	6	2
	ASX445-125B12R	●	12	125	138.0	63	40	32	56	80	16.4	9	2.3	6	3
	ASX445-160C16R	●	16	160	173.0	63	40	29	56	100	16.4	9	3.6	6	4
	ASX445-200C20R	●	20	200	212.9	63	60	32	135	155	25.7	14.22	6.5	6	5
	ASX445-250C24R	●	24	250	262.9	63	60	32	174	200	25.7	14.22	10.3	6	5
	ASX445-315C28R	●	28	315	327.9	80	60	57	256.8	285	25.7	14.22	21.8	6	5

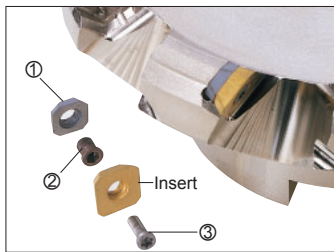
Screw-on Insert type Face Milling Cutter



Right hand tool holder only.

SHANK TYPE

Order Number	Stock R	Number of Teeth	Dimensions (mm)					Max. Depth of Cut ap (mm)
			D ₁	D ₂	L ₁	D ₄	L ₂	
ASX445R503S32	●	3	50	63.0	125	32	40	6
ASX445R634S32	●	4	63	75.9	125	32	40	6
ASX445R804S32	●	4	80	93.2	125	32	40	6



SPARE PARTS

Tool Holder Number	①	②	③		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX445	STASX445N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

Wrench	1. Wrench The ASX400 uses a TORXPLUS® clamp screw. The attached wrench is for the exclusive use of this screw. To ensure the effectiveness of TORXPLUS® only use the attached wrench. 2. Hexagonal wrench The attached hexagonal wrench is for use with the seat and the shim. The wrench size is 3.5mm.
Spare Parts	Only use the original parts that were supplied when purchased. If other parts are used the performance and safety can not be assured.

● : Inventory maintained in Japan. (10 inserts in one case) (CBN and PCD inserts are available with 1 piece in one case)

INSERTS WITH BREAKER

Application	Shape	Order Number	Class	Honing	Coated										Cermets	Carbide	Dimensions (mm)				Geometry	
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT			NX4545	D1	S1	F1		Re
Finish—Light Cutting		SEET13T3AGEN-JL	E	E	●	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
Light—Semi-Heavy Cutting		SEMT13T3AGSN-JM	M	S	●	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
Medium—Heavy Cutting		SEMT13T3AGSN-JH	M	S	●	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
Roughing For Cast Iron		SEMT13T3AGSN-FT	M	S	●												●	13.4	3.97	1.9	1.5	
For Aluminium Alloy		SEGT13T3AGFN-JP	G	F													●	13.4	3.97	2.2	-	

Notes when using JP breaker

- *The cutting edge of the JP breaker is sharp. Please wear gloves to prevent injury.
- *During machining of aluminium alloy, chip welding can occur that can cause fracturing of the insert.
- *Wet cutting is recommended.

WIPER INSERTS

Shape	Order Number	Honing	Coated	Cermets	Coated Cermets	Carbide	CBN	PCD	Dimensions (mm)					Geometry	
			MC5020	VP15TF	NX2525	VP25N	HT105T	MB710	MD220	L1	L2	S1	F1		Re
	WEEW13T3AGER8C	E	●	●		●				16.48	16.60	3.97	7.5	1.5	
	WEEW13T3AGTR8C	T		●	●					16.48	16.60	3.97	7.5	1.5	
	WEEW13T3AGFR3C	F						●		16.48	16.60	3.97	3.0	1.5	
	WEEW13T3AGTR3C	T					●			16.48	16.60	3.97	3.0	1.5	

- *Wiper inserts are single-cornered.
- *CBN grade MB710 is for cast iron.
- *PCD grade MD220 is for aluminium alloy.
- *Please refer to page 10 for notes when using wiper insert.

Screw-on Insert type Face Milling Cutter

RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Finish—Light Cutting		Light—Semi-Heavy Cutting		Medium—Heavy Cutting		
				Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	
P Mild Steel	≤180HB	F7030	280 (210—350)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MP6120 VP15TF	250 (200—300)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MP6130	240 (190—290)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		VP30RT	230 (180—280)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		NX4545	180 (130—230)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	—	—	
	Carbon Steel Alloy Steel	180—280HB	F7030	250 (200—300)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH
			MP6120 VP15TF	220 (170—270)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH
			MP6130	200 (150—230)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH
			VP30RT	150 (120—180)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH
			NX4545	150 (120—180)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	—	—
280—350HB		F7030	180 (130—230)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MP6120 VP15TF	140 (100—180)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MP6130	120 (90—150)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		VP30RT	100 (80—160)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		NX4545	100 (80—160)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	—	—	
M Stainless Steel	≤270HB	MP7130 VP15TF	220 (170—270)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MP7140 VP30RT	200 (150—250)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		NX4545	150 (120—180)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	—	—	
K Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	200 (150—250)	—	—	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH FT	
	Tensile Strength ≥450MPa	VP15TF	180 (130—250)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MC5020	110 (80—150)	—	—	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH FT	
N Aluminium Alloy	—	HTi10	650 (300—1000)	0.15 (0.1—0.2)	JP	0.2 (0.1—0.3)	JP	0.3 (0.2—0.4)	JP	
S Titanium Alloy	—	MP9120 VP15TF	50 (40—60)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
		MP9130	45 (30—55)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH	
	Heat Resistant Alloy (Inconel718 etc.)	—	MP9120 VP15TF	40 (20—50)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH
			MP9130	35 (15—45)	0.15 (0.1—0.2)	JL	0.2 (0.1—0.3)	JM	0.3 (0.2—0.4)	JH
H Hardened Steel	40—55HRC	VP15TF	80 (60—100)	0.1 (0.05—0.15)	JL	0.15 (0.1—0.2)	JM	0.2 (0.1—0.3)	JH	

● Revolution (min⁻¹)=(1000 x Cutting Speed)÷(3.14 x φD1) ● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

Instructions for use of wiper inserts



Fig.1



Fig.2

- Wiper inserts for ASX445 are single-cornered.
- When installing the wiper insert, place the insert so that the cutting edge is located as shown Fig.1. Do not install the wiper insert as Fig.2
- Recommended depth of cut is $a_p = 0.2-0.5(\text{mm})$.
(Be aware of cutting load if the depth of cut is over the recommendation.)
- The major cutting edge of a wiper insert should be set inside as shown. This is to prevent heavy loads on the wiper and ensure the regular insert after the wiper takes the cutting load. To prevent fracture, set the feed under 0.2mm/tooth .
- Excellent finished surfaces can be achieved with one wiper.
- Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than the width of the wiper edge.

RECOMMENDED CUTTING CONDITIONS WHEN USING A WIPER INSERT

Work Material	Grade	Recommended Cutting Speed (m/min)
P	VP25N	200 (80–250)
	VP15TF	180 (80–250)
M	VP15TF	120–270
K	MC5020	130–250
	VP15TF	
S	VP15TF	20–50
H	VP15TF	40–80

- Recommended depth of cut (a_p) is $0.2\text{mm}-0.5\text{mm}$, and feed per tooth (f_z) is up to 0.2mm/t .

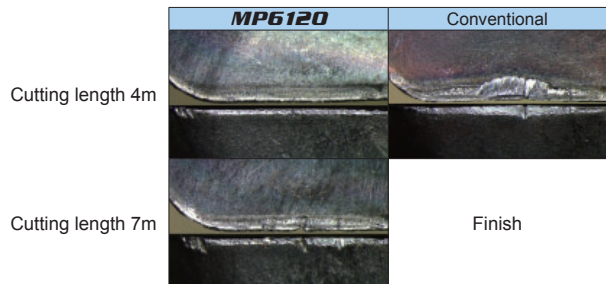
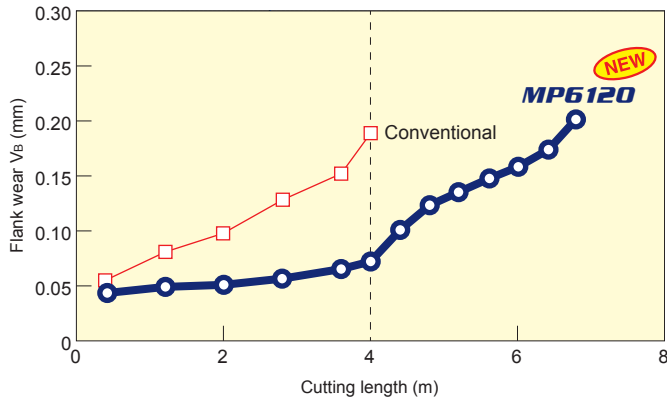
Screw-on Insert type Face Milling Cutter

Cutting Performance

Cutting of General Steel

STABLE, LONG TOOL LIFE, HIGH ACCURACY BODY

Wear Resistance



<Cutting conditions>

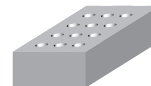
Workpiece : JIS SCM440
 Tool : ASX445R12508E
 Insert : SEMT13T3AGSN-JM
 Cutting speed : 270m/min
 Feed : 0.2mm/tooth
 Depth of cut : 2.0mm
 Dry cutting

Fracture Resistance (Heavy interrupted cutting)

	Feed (mm/tooth)			
	0.26	0.28	0.30	0.32
JHbreaker (F7030)	○	○	○	○
Competitor (P20 type)	○	✗ Fracture	○	○

<Cutting conditions>

Workpiece : JIS SCM440
 Tool : ASX445R12506E
 Insert : SEMT13T3AGSN-JH
 Cutting speed : 200m/min
 Depth of cut : 2.5mm
 Cutting time : 2min/pass
 Dry cutting



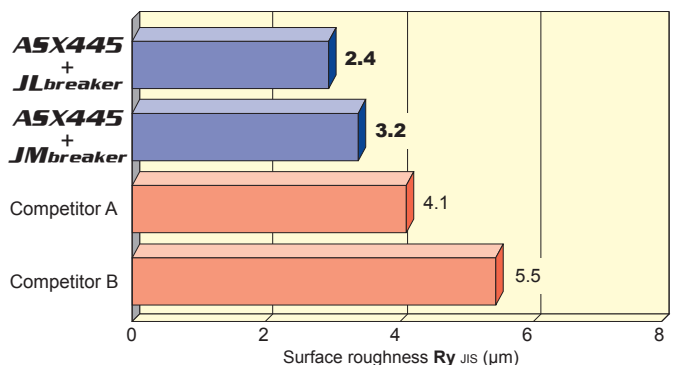
Chip Control

	Depth of cut (mm)	
	0.5	3.0
ASX445 + JMbreaker		
Wedge lock clamp type cutter + No chip breaker		

<Cutting conditions>

Workpiece : JIS SS400
 Tool : ASX445R12506E
 Insert : SEMT13T3AGSN-JM
 (SEMT13T3AGSN-JM insert)
 : Wedge lock clamp type cutter
 (No chip breaker)
 Grade : F7030
 Cutting speed : 300m/min
 Depth of cut : 0.5mm, 3.0mm
 Feed : 0.3mm/tooth
 Dry cutting

Surface Roughness



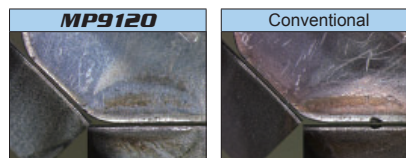
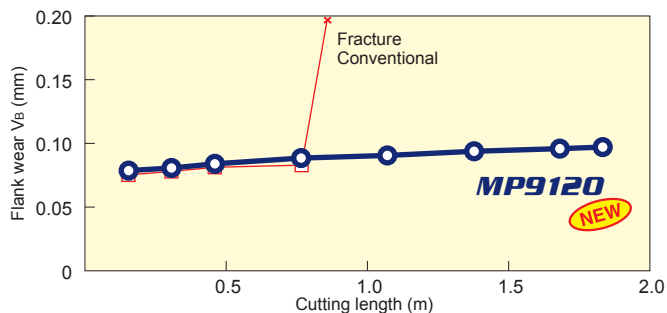
<Cutting conditions>

Workpiece : JIS SCM440
 Tool : ASX445R12506E
 Insert : SEET13T3AGEN-JL
 SEMT13T3AGSN-JM
 6 inserts
 Grade : F7030
 Cutting speed : 220m/min
 Feed : 0.1mm/tooth
 Depth of cut : 0.5mm
 Dry cutting

Titanium alloy machining

The PVD coated grade MP9120 with a JM breaker is recommended for machining titanium and heat resistant alloys.

Wear Resistance

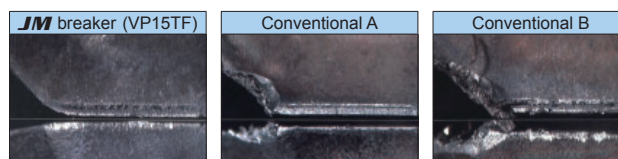
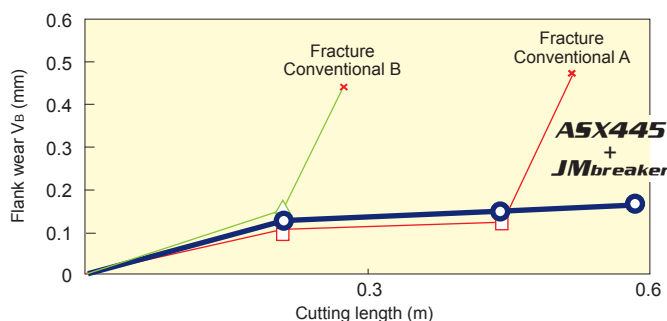


<Cutting conditions>
 Workpiece : Ti-6Al-4v
 Tool : ASX445R804S32
 Insert : SEMT13T3AGSN-JM
 Grade : MP9120
 Cutting speed : 50m/min
 Feed : 0.15mm/tooth
 Depth of cut : 1.5mm

Heat treated steel machining

For hardened steel machining, a combination of the PVD coated grade VP15TF with the JM breaker is recommended.

Wear Resistance

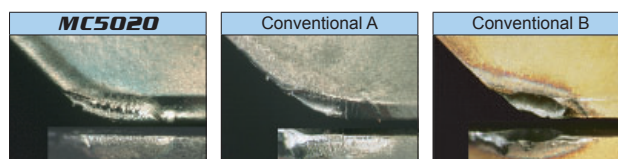
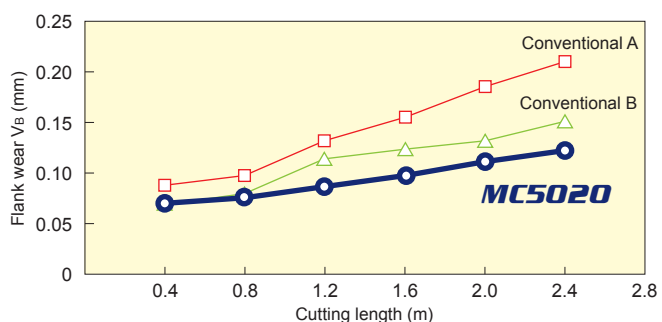


<Cutting conditions>
 Workpiece : JIS SKD61(43HRC)
 Tool : ASX445R12506E
 Insert : SEMT13T3AGSN-JM
 Grade : VP15TF
 Cutting speed : 100m/min
 Feed : 0.12mm/tooth
 Depth of cut : 2.0mm
 Dry cutting

Cast iron machining

For cast iron machining, the PVD coated grade MC5020 shows outstanding wear resistance. For rough cutting, the specialised FT breaker is recommended.

Wear Resistance



<Cutting conditions>
 Workpiece : JIS FCD700
 Tool : ASX445R12506E
 Insert : SEMT13T3AGSN-JM
 Grade : MC5020
 Cutting speed : 250m/min
 Feed : 0.3mm/tooth
 Depth of cut : 1.5mm
 Dry cutting

Cutting Performance

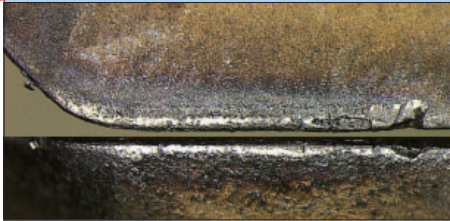
Stainless steel machining

The PVD coated grade MP7140 with JM breaker is recommended for unstable machining stainless steel.

Chipping Resistance

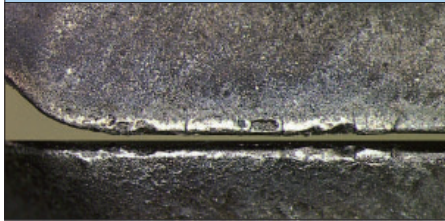
NEW

MP7140 JM breaker



Cutting length :1.4m

Conventional



Cutting length :0.8m

<Cutting conditions>

Workpiece : SUS304
Tool : ASX445R12508E
Insert : SEMT13T3AGSN-JM
Cutting speed : 200m/min
Feed : 0.2mm/tooth
Depth of cut : ap=2.0mm ae=100mm
Dry cutting

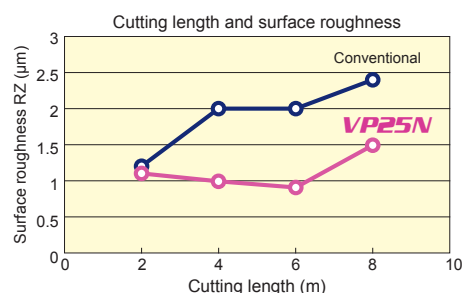
Machining using a wiper insert

The coated grades MC5020, VP15TF and VP25N enable extended tool life.

General steel

	Insert wear	Surface roughness profile
Cutting length 8m VP25N		<p>(μm) Roughness profile Axial magnification:x2,000 Transverse magnification:x50</p> <p>Rz=1.52μm</p>
Conventional		<p>(μm) Roughness profile Axial magnification:x2,000 Transverse magnification:x50</p> <p>Rz=2.36μm</p>

<Cutting conditions>
 Workpiece : SCM440 (HB244)
 Tool : ASX445R10007D
 Insert : WEEW13T3AGTR8C
 Cutting speed : 250m/min
 Feed : 1.4mm/rev
 Depth of cut : ap=0.1mm ae=78mm
 Dry cutting



Stainless steel

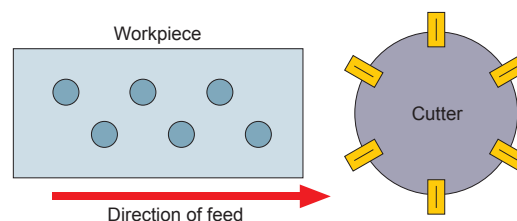
	Insert wear	Surface roughness profile
Cutting length 6.2m VP15TF		<p>(μm) Roughness profile Axial magnification:x2,000 Transverse magnification:x50</p> <p>Rz=2.95μm</p>
Cutting length 10.2m Competitor		<p>(μm) Roughness profile Axial magnification:x2,000 Transverse magnification:x50</p> <p>Rz=3.60μm</p>

<Cutting conditions>
 Workpiece : SUS304 (171HB)
 Tool : ASX445R12512E
 Insert : WEEW13T3AGER8C
 Cutting speed : 270m/min
 Feed : 2.4mm/rev
 Depth of cut : ap=0.1mm ae=100mm
 Dry cutting

Cast iron

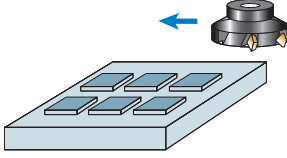
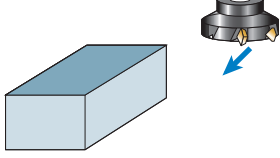
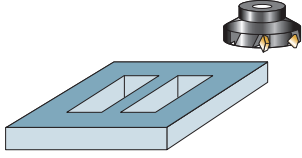
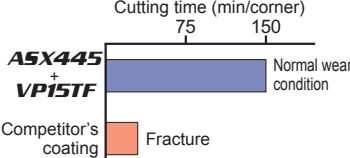
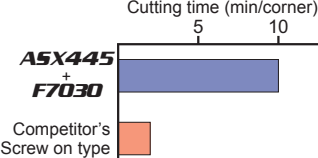
	Insert wear	Surface roughness profile
Cutting length 40m MC5020 (Major cutting edge offset)		<p>(μm) Roughness profile Axial magnification:x2,000 Transverse magnification:x50</p> <p>Rz=3.53μm</p>
Conventional (No offset)		<p>(μm) Roughness profile Axial magnification:x2,000 Transverse magnification:x50</p> <p>Rz=7.12μm</p>

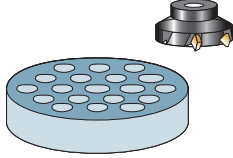
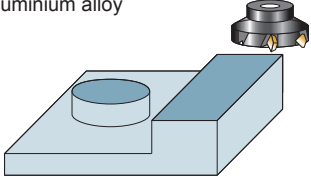
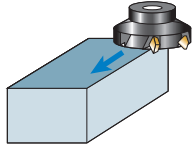
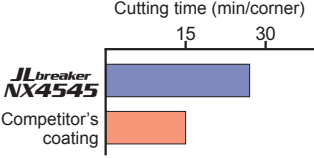
<Cutting conditions>
 Workpiece : FC300 (Perforated)
 Tool : ASX445R12506E
 Insert : WEEW13T3AGER8C
 Cutting speed : 200 mm/min
 Feed : 0.2 mm/tooth
 Depth of cut : ap=1mm ae=100mm
 Dry cutting

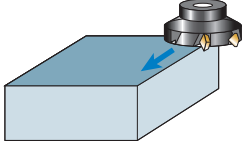
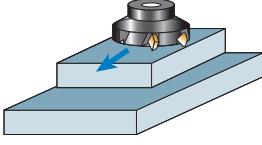
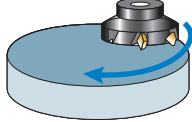


Screw-on Insert type Face Milling Cutter

APPLICATION EXAMPLES

Cutter Body	ASX445R16007F	ASX445R16010F	ASX445R25010K
Insert (Grade)	SEMT13T3AGSN-JM (VP15TF)	SEMT13T3AGSN-JM (F7030)	SEMT13T3AGSN-JM (VP30RT)
Workpiece	Welded parts 	JIS S45C 	JIS SUS316 
Component	Machine parts	Machine parts	Ship component
Cutting Conditions	Cutting Speed (m/min)	200	157
	Feed (mm/tooth)	0.27	0.15
	Depth of Cut (mm)	3	1
Coolant	Dry cutting	Wet cutting	Dry cutting
Results	<p>Cutting time (min/corner)</p> <p>75 150</p> <p>ASX445 + VP15TF Normal wear condition</p> <p>Competitor's coating Fracture</p> 	<p>Cutting time (min/corner)</p> <p>5 10</p> <p>ASX445 + F7030</p> <p>Competitor's Screw on type</p> 	VP30RT increases tool life x 4, without fracturing. Conventional cutters resulted in shorter tool life and fracturing.

Cutter Body	ASX445R16007F	ASX445R12506E	ASX445-063A04R
Insert (Grade)	SEET13T3AGEN-JL (NX4545)	SEGT13T3AGFN-JP (HTi10)	SEMT13T3AGSN-JM (MP9130)
Workpiece	Stainless steel 	Aluminium alloy 	ASTM304 
Component	Machine parts	Machine parts	Machine parts
Cutting Conditions	Cutting Speed (m/min)	150	780
	Feed (mm/tooth)	0.06	0.19
	Depth of Cut (mm)	1.5	(Rough cutting) 2 (Finishing) 0.25
Coolant	Dry cutting	Dry cutting	Dry cutting
Results	<p>Cutting time (min/corner)</p> <p>15 30</p> <p>JLbreaker NX4545</p> <p>Competitor's coating</p> 	Vibration free cutting resulted in a good surface finish. Conventional cutters produced vibration on the low rigidity work piece.	MP9130 achieves double tool life without burr formation compared to conventional cutters.

Cutter Body		ASX445R08004C	ASX445R12508E	ASX445R12508E
Insert (Grade)		SEMT13T3AGSN-JM (MP9130)	SEMT13T3AGSN-JM (MP6120)	SEMT13T3AGEN-JL (MP9120)
Workpiece		15-5PH(Stainless steel) 	SCM440H 	Ti-6Al-4V 
	Component	Aerospace parts	Machine parts	Aerospace parts
Cutting Conditions	Cutting Speed (m/min)	150	250	76
	Feed (mm/tooth)	0.12	0.1-0.2	0.1
	Depth of Cut (mm)	ap:2, ae:76	2.0-5.0	0.25
Coolant		Dry cutting	Dry cutting	Wet cutting
Results		MP9130 provides double tool life compared to conventional cutters and achieves high efficiency cutting by shortening the time required to replace a tool.	MP6120 shows only a small amount of wear thereby achieving 1.5 times longer tool life compared to conventional cutters.	Machining time can be extended 3 times longer without chipping.



Screw-on Insert type Face Milling Cutter

ASX445

For Your Safety

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

MITSUBISHI MATERIALS CORPORATION

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