MITSUBISHI

MITSUBISHI CARBIDE

TOOLS NEWS

2004.8.Update B023G

New FT chipbreaker with nose radius 2.0mm

Screw-on Insert type Shoulder Milling Cutter

ASX400

Carbide sheet and proprietary Anti-Fly Insert employed.

Stable shoulder milling even under heavy cutting conditions.

FT Heavy cutting/ Heavy interrupted cuts *Breaker*

NEW

■Economical due to the employment of inserts with 4 cutting edges.

■The 3D design of the cutting edge and large rake angle achieve excellent cutting edge performance.

■Easy to use and clamping with high accuracy.

MIRACLE® Coating

VP15TF
Effective in machining a wide range of materials

VP30RT
Ideal for heavy interrupted cutting of general steel and stainless steel

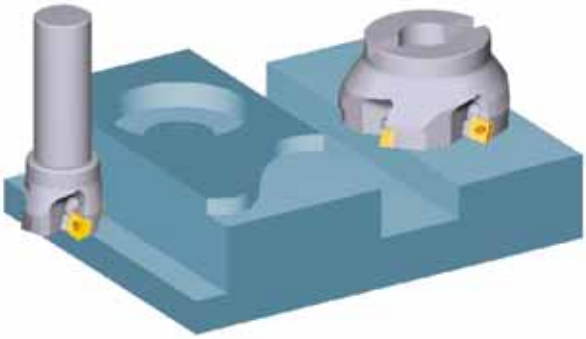
Screw-on Insert type Shoulder Milling Cutter

ASX400

Features

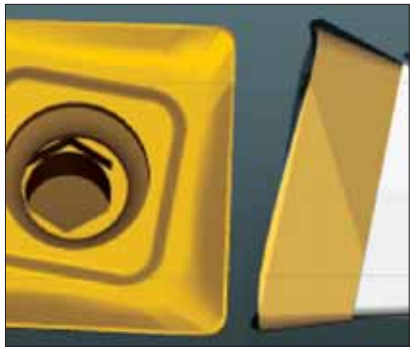
Economical

ASX400 is economical as it employs inserts that have 4 cutting edges. Additionally with one tool it is possible to carry out face milling, shoulder milling, and slotting.



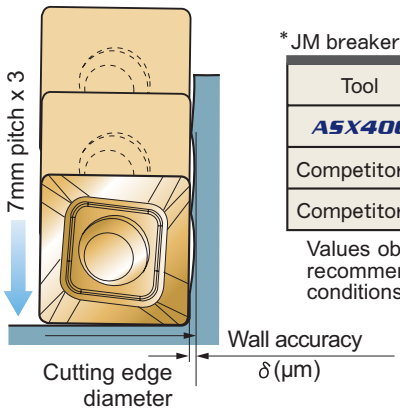
Low Resistance

Due to the 3D design of the cutting edge and a large rake angle the cutting resistance is reduced, and high cutting edge sharpness has been achieved.



High Accuracy

Thanks to the curved edge and the high accuracy body and insert, high accuracy surface finish on walls and high quality surface finish on bottoms can be obtained.



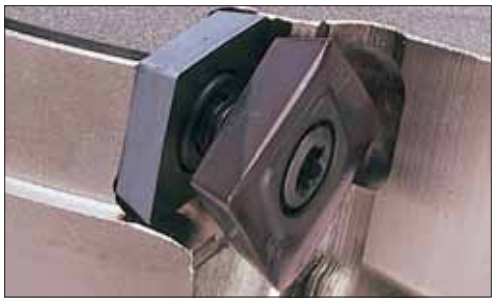
*JM breaker data

Tool	δ
ASX400	30
Competitor A	100
Competitor B	122

Values obtained under recommended cutting conditions.

Easy to Use

Employs a screw on type mechanism therefore the inserts can be set with ease. Additionally when corner changing it is not necessary to remove the screw completely.

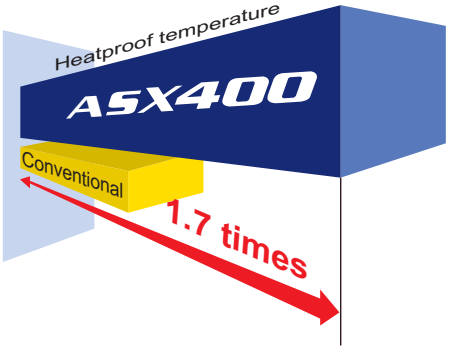


High Reliability

A carbide shim and Mitsubishi's proprietary Anti-Fly-Insert (A.F.I) to prevent the inserts from moving when machining is conducted is employed. Additionally the clamp screw uses TORXPLUS® therefore the clamping force is high, ensuring high reliability.

High Heat-resistant Body

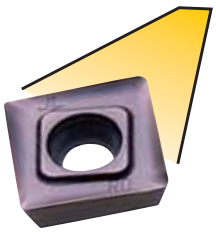
The cutter body is made form a special alloy that provides high strength at high temperature. A special surface treatment improves the corrosion and friction resistance. The **ASX400** can be used for long hours even under harsh conditions.



Wide Insert Variety

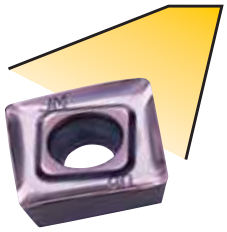
Chipbreakers for a wide range of applications

JL Finishing to Light cutting *Breaker*



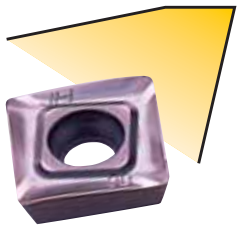
- High accuracy insert with ground-finished periphery.
- Large rake angle leading to low cutting resistance.

JM Light to Semi-heavy cutting *Breaker*



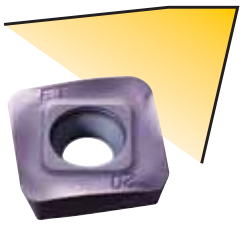
- High accuracy M class insert.
- Responding to a wide range of workpiece materials and cutting conditions.

JH Medium to Heavy cutting *Breaker*



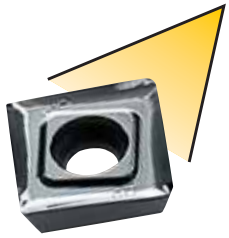
- High accuracy M class insert.
- Strong cutting edge leading to high fracture resistance.

FT Heavy cutting/ Heavy interrupted cuts *Breaker*



- Nose radius of 2.0mm has improved fracture resistance.
- Strong main cutting edge allows heavy cutting and heavy interrupted cutting. Stable cutting performance.

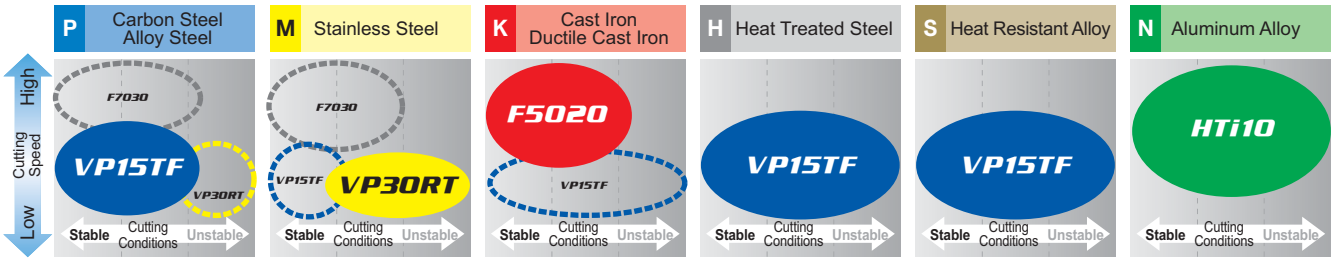
JP Aluminum alloy cutting *Breaker*



- High accuracy insert with ground-finished periphery.
- Large rake angle and mirror-finished rake face lead to sharp cutting performance and high welding resistance.

Variety of Grades

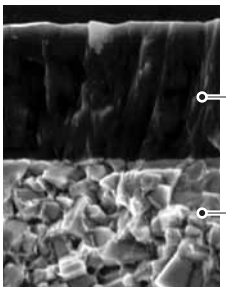
Insert grades for a wide range of materials



* When machining steel or stainless steel and putting weight on surface finish, use cermet grade NX4545.

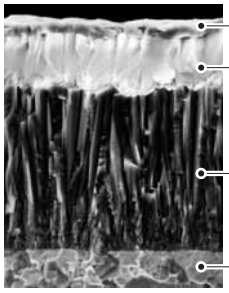
Stable Cutting : Continuous cutting, Constant depth of cut, Pre-machined securely clamped component cutting
Unstable Cutting : Heavy interrupted cutting, Irregular depth of cut, Low clamping rigidity cutting

MIRACLE® coated VP15TF



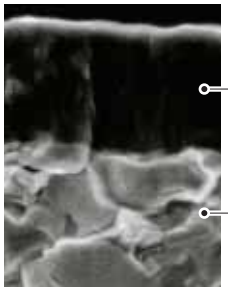
Miracle coated **VP15TF** displays high welding resistance therefore it can be used for machining a wide range of workpiece materials such as Plain steels, Mild steels, Low carbon steels and Stainless steels.

CVD coated grade F7030



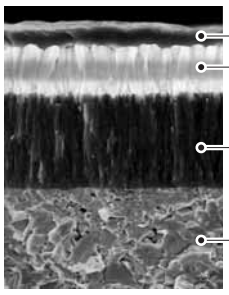
A combination of tough special cemented carbide substrate, featuring superior resistance to thermal crack and fracture, and CVD coating, boasting superior wear resistance, enables high-performance machining of steel and stainless steel both in dry and wet cutting.

MIRACLE® coated VP30RT



A combination of tough special cemented carbide substrate and MIRACLE coating provides excellent fracture resistance. Ideal for heavy interrupted cutting of stainless steel and general steel.

CVD coated grade F5020



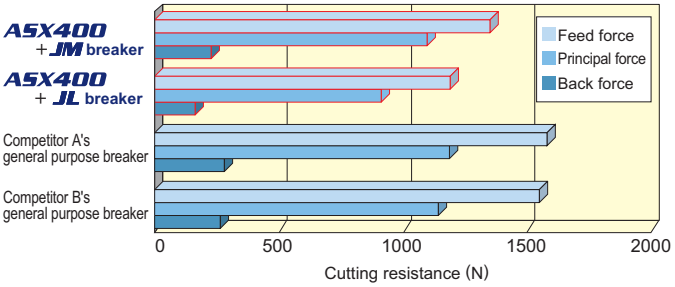
A combination of tough special cemented carbide substrate and highly wear-resistant CVD coating exhibits great cutting edge reliability in machining cast iron and ductile cast iron.

ASX400

Cutting Performance

Cutting of General Steel

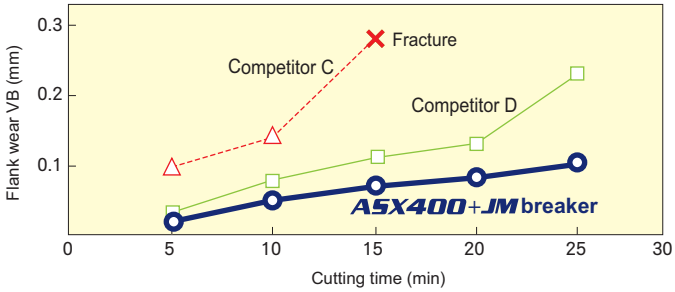
Cutting Resistance



<Cutting conditions>

Workpiece	: JIS SCM440	Cutting speed	: 150m/min
Tool	: ASX400R10005D	Feed	: 0.2mm/tooth
Insert	: SOMT12T308PEER-JM SOET12T308PEER-JL	Depth of cut	: 3mm
		Width of cut	: 50mm
Insert grade	: VP15TF	Down cutting, Dry cutting, 1 insert	

Wear Resistance



<Cutting conditions>

Workpiece	: JIS S55C	Cutting speed	: 200m/min
Tool	: ASX400R12506E	Feed	: 0.2mm/tooth
Insert	: SOMT12T308PEER-JM	Depth of cut	: 3mm
Insert grade	: VP15TF	Width of cut	: 50mm
		Down cutting, Dry cutting, 1 insert	

Cutting of Hardened Steel

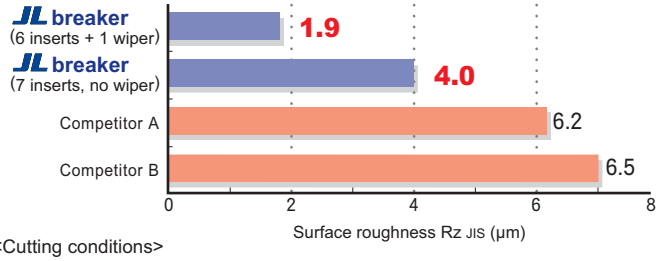
Cutting length 1.7m

Cutting length 0.15m

<Cutting conditions>

Workpiece	: JIS SKD61 (53HRC)	Cutting speed	: 75m/min
Tool	: ASX400R503S32	Feed	: 0.15mm/tooth
Insert	: SOMT12T308PEER-JM	Depth of cut	: 5mm
Insert grade	: VP15TF	Width of cut	: 10mm
		Down cutting, Dry cutting, 1 insert	

Finished Surface Roughness



<Cutting conditions>

Workpiece	: JIS S55C	Cutting speed	: 150m/min
Tool	: ASX400R10007D	Feed	: 0.1mm/tooth
Insert	: SOET12T308PEER-JL WOEW12T308PETR8C	Depth of cut	: 1mm
		Width of cut	: 50mm
Insert grade	: NX4545 / NX2525	Down cutting, Dry cutting, All inserts	

Cutting of Stainless Steel

<Cutting conditions>

Workpiece	: JIS SUS304	Cutting speed	: 150m/min
Tool	: ASX400R1005D	Feed	: 0.15mm/tooth
Insert	: SOMT12T308PEER-JM	Depth of cut	: 5mm
Insert grade	: VP30RT	Width of cut	: 20mm
		Down cutting, Dry cutting, 1 insert	
		Cutting time	: 25min.

Cutting of Aluminum Alloy

Tool	Wall accuracy (μm)	Base surface finish RzJIS (μm)	Results
ASX400	15	3	Stable machining. Small cutting power.
Competitor A	40	12	Large welding and unstable machining.
Competitor B	51	9	Big cutting power and vibration.

<Cutting conditions>

Workpiece	: JIS A6061	Cutting speed	: 750m/min
Tool	: ASX400R404S32	Feed	: 0.1mm/tooth
Insert	: SOGT12T308PEFR-JP	Depth of cut	: 7mm x 3times
Insert grade	: HTi10	Width of cut	: 3mm
		Down cutting, Wet cutting, All inserts	

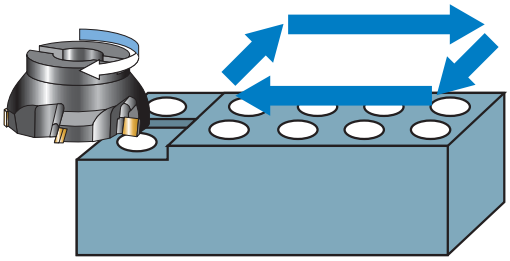
Cutting of Cast Iron by *FT* breaker

Wear Resistance

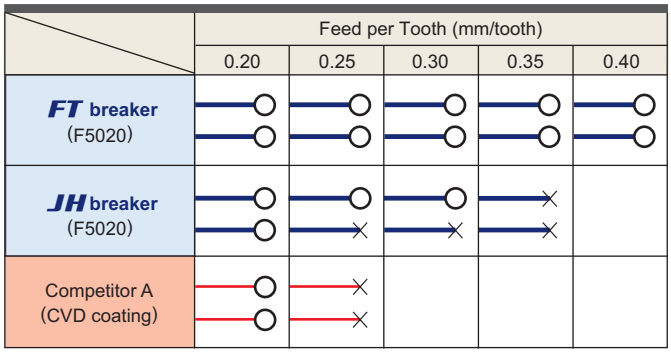
<Cutting conditions>

Workpiece : JIS FC300 (Punched workpiece)
Tool : ASX400R10007D
Insert : SOMT12T320PEER-FT
Insert grade : F5020

Cutting speed : 250m/min
Feed : 0.15mm/tooth
Depth of cut : 3mm
Width of cut : 35mm
Down cutting, Semi-wet cutting, 1 insert
Cutting length : 8m (Cutting time 67min)



Fracture Resistance



<Cutting conditions>

Workpiece : JIS FC300 (Punched workpiece)
Tool : ASX400R10007D
Insert : SOMT12T320PEER-FT
Insert grade : F5020

Cutting speed : 250m/min
Depth of cut : 3mm
Width of cut : 55mm
Down cutting, Semi-wet cutting, 1 insert
Cutting time : 4min/pass

Recommended Cutting Conditions

Workpiece		Hardness	Insert Grade	Cutting Speed (m/min)	Finishing to Light Cutting		Light to Semi-heavy Cutting		Medium to Heavy Cutting	
					Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker
P	Mild Steel (JIS SS400, S10C etc.)	≤180HB	F7030	280 (210－350)	0.18 (0.08－0.28)	JL	0.2 (0.1－0.3)	JM	0.25 (0.1－0.35)	JH
			VP15TF	250 (200－300)	0.18 (0.08－0.28)	JL	0.2 (0.1－0.3)	JM	0.25 (0.1－0.35)	JH FT
			VP30RT	230 (180－280)	0.18 (0.08－0.28)	JL	0.2 (0.1－0.3)	JM	0.25 (0.1－0.35)	JH
			NX4545	180 (130－230)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	–	–
	Carbon Steel Alloy Steel (JIS S45C, SCM440 etc.)	180－280HB	F7030	250 (200－300)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	0.2 (0.1－0.3)	JH
			VP15TF	220 (170－270)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	0.2 (0.1－0.3)	JH FT
			VP30RT	200 (150－250)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	0.2 (0.1－0.3)	JH
			NX4545	150 (120－180)	0.13 (0.06－0.2)	JL	0.15 (0.1－0.25)	JM	–	–
		280－350HB	F7030	180 (130－230)	0.13 (0.06－0.2)	JL	0.15 (0.1－0.25)	JM	0.18 (0.1－0.28)	JH
			VP15TF	140 (100－180)	0.13 (0.06－0.2)	JL	0.15 (0.1－0.25)	JM	0.18 (0.1－0.28)	JH FT
			VP30RT	120 (80－160)	0.13 (0.06－0.2)	JL	0.15 (0.1－0.25)	JM	0.18 (0.1－0.28)	JH
			NX4545	100 (80－120)	0.1 (0.05－0.15)	JL	0.13 (0.1－0.2)	JM	–	–
M	Stainless Steel (JIS SUS304 etc.)	≤270HB	VP15TF	220 (170－270)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	0.2 (0.1－0.3)	JH FT
			VP30RT	200 (150－250)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	0.2 (0.1－0.3)	JH
			NX4545	150 (120－180)	0.15 (0.07－0.23)	JL	0.18 (0.1－0.28)	JM	–	–
K	Cast Iron Ductile Cast Iron (JIS FC250, FCD400 etc.)	Tensile strength ≤450MPa	F5010	200 (150－250)	–	–	0.2 (0.1－0.3)	JM	0.25 (0.1－0.35)	JH
			F5020	200 (150－250)	–	–	0.2 (0.1－0.3)	JM	0.25 (0.1－0.35)	JH FT
			VP15TF	180 (130－230)	0.18 (0.1－0.28)	JL	0.2 (0.1－0.3)	JM	0.25 (0.1－0.35)	JH FT
H	Heat Treated Steel	40－60HRC	VP15TF	80 (60－100)	0.08 (0.04－0.13)	JL	0.1 (0.05－0.15)	JM	0.12 (0.07－0.17)	JH FT
S	Heat Resistant Alloy (Inconel, Waspalloy etc.)	–	VP15TF	40 (20－50)	0.15 (0.07－0.2)	JL	0.2 (0.1－0.3)	JM	–	–
N	Aluminum Alloy	–	HTi10	300－	0.15 (0.1－0.2)	JP	0.2 (0.1－0.3)	JP	0.3 (0.2－0.4)	JP

Screw-on Insert type Shoulder Milling Cutter

ASX400

Arbor type

Fig. 1 Ø50 Ø63

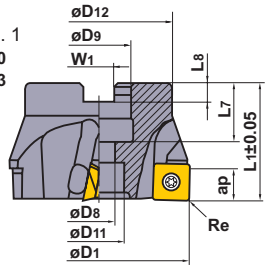


Fig. 2 Ø80 Ø100 Ø125 Ø160

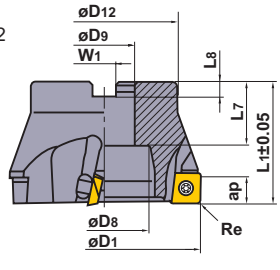
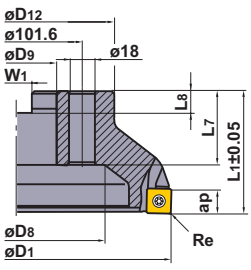


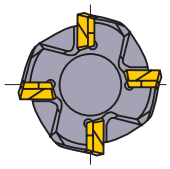
Fig. 3 Ø200 Ø250

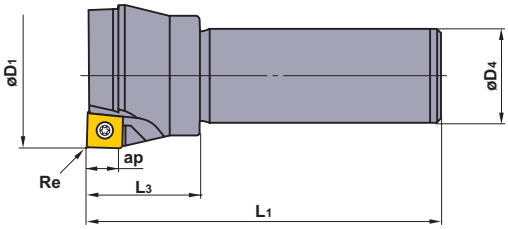


Right hand tool holder only. Tolerance when setting with master inserts.

Type	Order Number	Stock	Number of teeth	Dimensions (mm)									Tool weight	Max. Depth of cut	Type
		R		D_1	L_1	D_9	L_7	D_8	D_{11}	D_{12}	W_1	L_8	(kg)	ap	
Coarse Pitch	**ASX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	Fig. 1
	-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.5	10	Fig. 1
	R08004C	●	4	80	50	25.4	26	38	–	60	9.5	6	1.0	10	Fig. 2
	R10005D	●	5	100	50	31.75	32	45	–	70	12.7	8	1.5	10	Fig. 2
	R12506E	●	6	125	63	38.1	35	60	–	80	15.9	10	2.5	10	Fig. 2
	R16008F	●	8	160	63	50.8	38	90	–	100	19.0	11	4.0	10	Fig. 2
	R20010K	●	10	200	63	47.625	35	135	–	160	25.4	14	7.0	10	Fig. 3
	R25012K	●	12	250	63	47.625	35	180	–	210	25.4	14	12.0	10	Fig. 3
Fine Pitch	**ASX400-050A04R**	●	4	50	40	22	20	11	17	41	10.4	6.3	0.3	10	Fig. 1
	-063A05R	●	5	63	40	22	20	11	17	50	10.4	6.3	0.5	10	Fig. 1
	R08006C	●	6	80	50	25.4	26	38	–	60	9.5	6	1.0	10	Fig. 2
	R10007D	●	7	100	50	31.75	32	45	–	70	12.7	8	1.5	10	Fig. 2
	R12508E	●	8	125	63	38.1	35	60	–	80	15.9	10	2.5	10	Fig. 2
	R16012F	●	12	160	63	50.8	38	90	–	100	19.0	11	4.0	10	Fig. 2
	R20016K	●	16	200	63	47.625	35	135	–	160	25.4	14	7.0	10	Fig. 3
	R25018K	●	18	250	63	47.625	35	180	–	210	25.4	14	12.0	10	Fig. 3

Shank type





Right hand tool holder only.

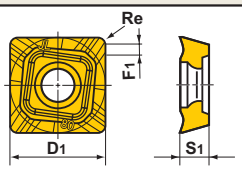
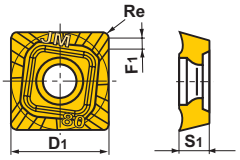
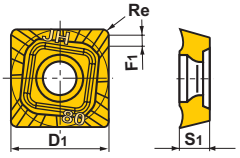
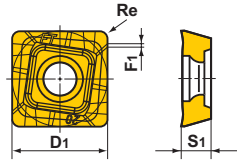
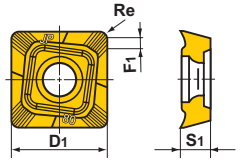
Type	Order Number	Stock	Number of teeth	Dimensions (mm)				
		R		D_1	L_1	D_4	L_3	ap
Coarse Pitch	**ASX400R403S32**	●	3	40	125	32	40	10
	503S32	●	3	50	125	32	40	10
	634S32	●	4	63	125	32	40	10
	804S32	●	4	80	125	32	40	10
Fine Pitch	**504S32**	●	4	50	125	32	40	10
	635S32	●	5	63	125	32	40	10
	806S32	●	6	80	125	32	40	10

SPARE PARTS

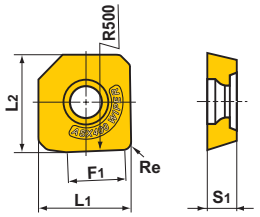
Holder					
	Shim	Shim screw	Clamp screw	Wrench (Insert)	Wrench (Shim)
ASX400	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

● : Inventory maintained. No mark : Not manufactured.

INSERTS

Type	Shape	Order Number	Class	Coated					Cermet		Carbide		Dimensions (mm)				Geometry
				F7030	F5010	F5020	VP15TF	VP30RT	NX4545		HTi10		D_1	S_1	F_1	Re	
Finishing to Light cutting	JL Breaker	SOET12T308PEER-JL	E	●			●	●	●				12.7	3.97	1.4	0.8	
Light to Semi-heavy cutting	JM Breaker	SOMT12T308PEER-JM	M	●	●	●	●	●	●				12.7	3.97	1.4	0.8	
Medium to Heavy cutting	JH Breaker	SOMT12T308PEER-JH	M	●	●	●	●	●					12.7	3.97	1.4	0.8	
Heavy cutting/ Interrupted cuts	NEW FT Breaker	SOMT12T320PEER-FT	M			●	●						12.7	3.97	0.5	2.0	
Aluminum Alloy cutting	JP Breaker	SOGT12T308PEFR-JP	G								●		12.7	3.97	1.4	0.8	

WIPER INSERTS

Shape	Order Number	Class	Cermet		Carbide			Dimensions (mm)					Geometry
			NX2525		HTi05T			L_1	L_2	S_1	F_1	Re	
	WOEW12T308PEER8C	E			●			12.5	13.2	3.97	8	0.8	
	12T308PETR8C	E	●					12.5	13.2	3.97	8	0.8	

Instructions for Using Inserts

1. Instructions for using JP breaker

- JP breaker has sharp cutting edges. Wear gloves in handling JP breaker to prevent injury.
- In machining of aluminum alloy, welding to the cutting edge tends to occur, often leading to insert failure. To prevent this, conduct wet cutting, using coolant oil.

2. Instructions for using wiper insert

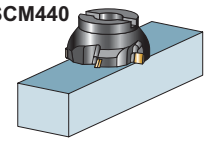
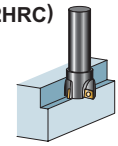
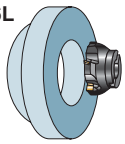
- Wiper inserts for the ASX400 are single-cornered.
- When installing the wiper insert, place the insert in the way that the chamfer is located at the far back of insert seat. (Refer to the figure at the left.)
- Outer peripheral edges of the wiper inserts are dented in comparison with those of normal inserts. Please pay special attention to the cutting edge condition of normal inserts coming right after wiper inserts in machining as they receive heavier load.

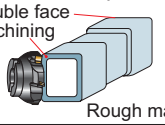
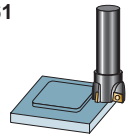
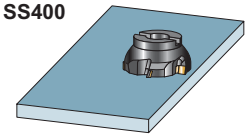
Screw-on Insert type Shoulder Milling Cutter

MITSUBISHI

ASX400

Application Example

Tool		ASX400R16012F	ASX400R635S32	ASX400R10005D
Insert (Grade)		SOMT12T308PEER-JM (F7030)	SOMT12T308PEER-JM (VP15TF)	SOMT12T308PEER-JM (VP30RT)
Workpiece		JIS SCM440 	JIS SKD61(52HC) 	JIS SUS316L 
Component		Machine parts	Mold material	Valve parts
Cutting Condition	Cutting Speed (m/min)	250	100	150
	Feed (mm/tooth)	0.15	0.1	0.15
	Depth of Cut (mm)	3	4 x 4pass	4
	Width of Cut (mm)	120	20	40～100
Coolant		Dry cutting	Dry cutting	Dry cutting
Results		Workpieces machined (pieces/edge) 0 10 20 ASX400 Competitors ✕ Large wear	Cutting time (min/edge) 0 15 30 ASX400 Competitors ✕ Fracture	Workpieces machined (pieces/edge) 0 20 40 ASX400 Competitors ✕ Fracture

Tool		ASX400R10007D	ASX400R403S32	ASX400R12506E
Insert (Grade)		SOMT12T320PEER-FT(F5020)	SOGT12T308PEFR-JP (HTi10)	SOET12T308PEER-JL (NX4545)
Workpiece		Ductile cast iron (JIS FCD500) Double face machining  Rough machining	JIS A6061 	JIS SS400 
Component		Clutch housing	Airplane parts	Machine parts
Cutting Condition	Cutting Speed (m/min)	200	1000	80
	Feed (mm/tooth)	0.2	0.15	0.13
	Depth of Cut (mm)	3.0	4 x 5pass	1.5
	Width of Cut (mm)	–	5～40	100
Coolant		Wet cutting	Wet cutting	Dry cutting
Results		Workpieces machined (pieces/edge) 0 50 100 ASX400 Competitors ✕ Fracture	Cutting time (hour/edge) 0 2 4 ASX400 Competitors ✕ Welding	Cutting time (surface/edge) 0 10 20 ASX400 Competitors ✕ Degraded finished surface

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.

For Your Safety
●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching chips or spare parts, please use the attached wrench or spanner. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

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(Tools specifications subject to change without notice.)

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