

High Feed Radius Milling Cutter

AJX

Series
Expansion

Patent : Registration no. 3775321
Design patent: Registration no. 1260214, 1263635



The use of a double-phased straight cutting edge and minor edge realize "High feed machining" for die & molds.

- Cost reductions with ultra high feed milling for mold & die machining
- New *ST* chipbreaker with tougher cutting edges
Effective for heavy interrupted cutting.
- New *JM* chipbreaker with sharp cutting edges
Suitable for BT40 and HSK machines.
- New small sizes, $\phi 16$ and $\phi 17$ can be used for an application range conventionally covered by solid end mills.
- Extra fine pitch and screw-in types now included.

MIRACLE® Coated VP15TF & VP30RT

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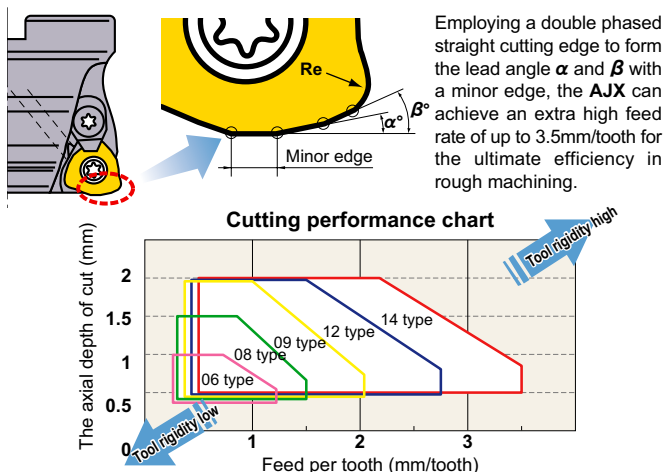
CVD Coated FH7020

High Feed Radius Milling Cutter

AJX

Features

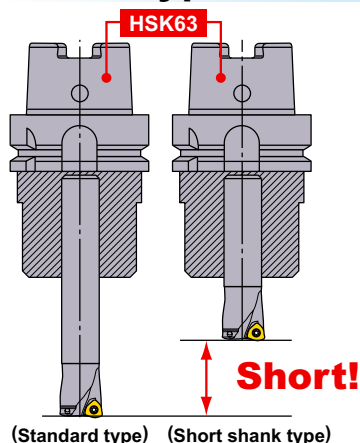
Ultra High Feed Cutting



High Reliability Cutter Body

- Highly rigid clamping**
Insert clamp bridges are standard (except AJX 06, 08 type). Rigid insert clamping for stable and reliable cutting.
- Cost-effective insert**
Specially designed, triangular type 3 corner insert geometry. For cost effective milling.
- Durable tool body**
AJX bodies are made from a heat resistant alloy. The special surface treatment applied to the body increases corrosion and friction resistance.
- Standard with coolant holes**
All AJX bodies are supplied with through coolant holes for smooth chip discharge, cutting edge cooling, and lubrication.

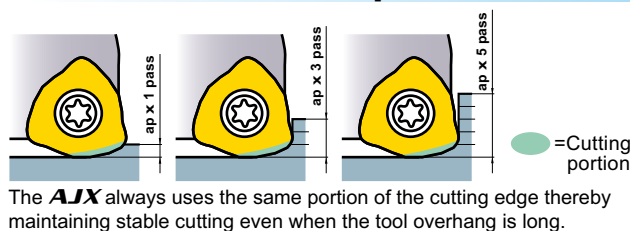
HSK63 Type Short Shanks



Short shank type AJX06 end mills are available. Although HSK63 holders are already short, the use of the short shank type AJX allows the minimum tool overhang length to be set.

The minimum tool overhang length enables stable, high efficiency machining even on high-speed machining centers.

Anti Vibration Properties



Preventing Chip Packing Problems

Comparison of raming angles

	Max. raming angle
AJX	2.8°
Conventional products	1°

*With ø63 type

The indents engineered into the inner and outer cutting edges maintain a large clearance, preventing chip packing problems.

For improved efficiency and a more stable cutting performance when raming and sinking compared to conventional products.

No Workpiece Interference

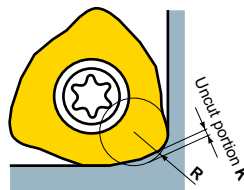
No interference!

- The AJX shank type is designed with an offset cutting diameter for workpiece and chip clearance as shown.
- Offset is designed large because big chips are generated in high feed machining.
- For deep cutting irrespective of neck length. Reduces the need for special long type tools.

Order Number	D1(mm)	D4(mm)
AJX06R172SA16	17	16
AJX06R223SA20	22	20
AJX08R222SA20	22	20
AJX08R283SA20	28	20
AJX09R282SA25	28	25
AJX09R353SA32	35	32
AJX09R404SA32	40	32
AJX12R352SA32	35	32
AJX12R40SA32	40	32
AJX14R503SA42	50	42
AJX14R634SA42	63	42

Please refer to page 5,6 for details of the holder.

Note for Programming




When using the AJX, please programme as an R3 radius cutter. The approximate uncut portions for the programme are as follows.

Insert	Approx. R(mm)	Uncut portion K(mm)
JOM06T215ZZSR	2.0	0.33
JOM080320ZZSR	2.5	0.46
JDM09T320ZDSR	3.0	0.47
JDM120420ZDSR	3.0	0.63
JDM140520ZDSR	3.0	0.64

Note.) The uncut portion may change slightly depending on cutting conditions.

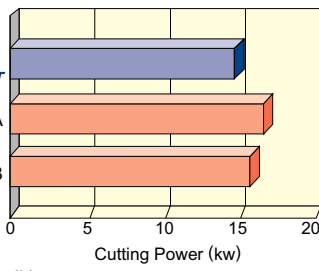
Wide Selection of Inserts

FT General Use Type Breaker



First recommended chipbreaker for general cutting

- An optimum balance of sharpness and fracture resistance.
- Versatile insert for a wide range of materials and cutting conditions.



AJX + FT breaker

Competitor A
Competitor B

0 5 10 15 20
Cutting Power (kw)

<Cutting Conditions>
Tool : $\phi 63$ - 4 teeth Feed per Tooth : 1.5mm/tooth
Workpiece : JIS S50C Depth of Cut : Axial 1.0mm
Revolution : 758min⁻¹ Radial 40mm
Cutting speed : 150m/min Air blow
Feed : 4547mm/min

ST Strong Cutting Edge Type Breaker




Stable machining even on interrupted work piece surfaces

- With increased fracture resistance during interrupted cutting due to the tougher cutting edges.
- For increased reliability and higher efficiency machining to reduce costs.



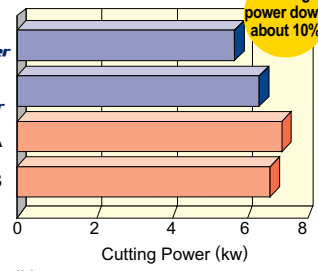
<Cutting Conditions>
Tool : AJX14-063A04R Cutting speed : 158m/min
Arbor : BT50-22-298-63TA Feed : 6400mm/min
Overhang : 348mm (GL) Feed per Tooth : 2.0mm/tooth
Insert : ST breaker FH7020 Depth of Cut : Axial 1.5mm
Workpiece : JIS S55C (With holes) Radial 45mm
Revolution : 800min⁻¹

JM Sharp Cutting Edge Type Breaker



Suitable for use on BT40 and HSK63 machines

- Boosts cutting performance with a large rake angle.
- Effective for anti-vibration machining for long overhang applications at higher than normal feeds for cost saving efficiency.



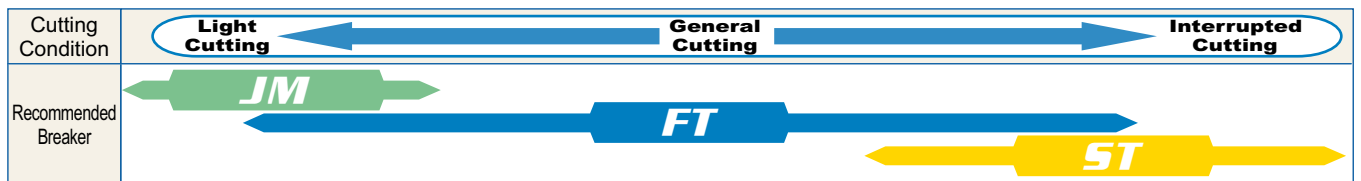
AJX + JM breaker

Competitor A
Competitor B

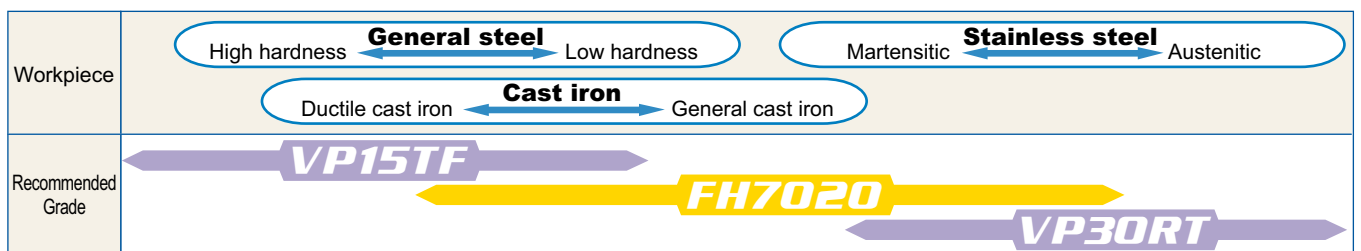
0 2 4 6 8
Cutting Power (kw)

<Cutting Conditions>
Tool : $\phi 40$ - 3 teeth Feed per Tooth : 1.4mm/tooth
Workpiece : JIS SCM440 Depth of Cut : Axial 1.0mm
Revolution : 1194min⁻¹ Radial 24mm
Cutting speed : 150m/min Air blow
Feed : 5000mm/min

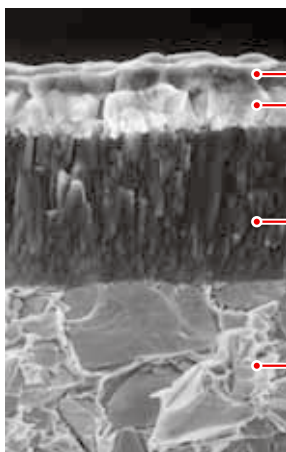
Application of Breakers



Application of Insert Grades



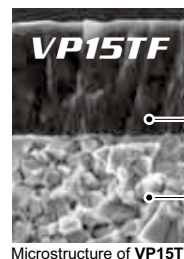
CVD Coating



Microstructure of FH7020

- Features of FH7020
FH7020 for long tool life.
Resistance to thermal cracking and crater wear.
Vapor deposited by the newly developed Even Coating Technology, the surface texture of the special titanium compound layers is very smooth and chemically stable. It enables stable cutting performance without chipping and peeling.
- Flat alumina (fine grained aluminum oxide with a smooth surface) is used as the outer layer. It has superior strength at high temperature and prevents crater wear usually associated with high speed cutting.
- The fibrous crystalline carbon titanium nitride inner layer is simultaneously resistant to wear and fracturing.
- The newly developed base metal of cemented carbide has improved heat-crack and fracture resistance.

MIRACLE® Coating



Microstructure of VP15TF

- VP15TF with high wear and fracture resistance, for stable, general machining operations.
- MIRACLE® coating (Al,Ti)N
- Cemented carbide substrate TF15



Microstructure of VP30RT

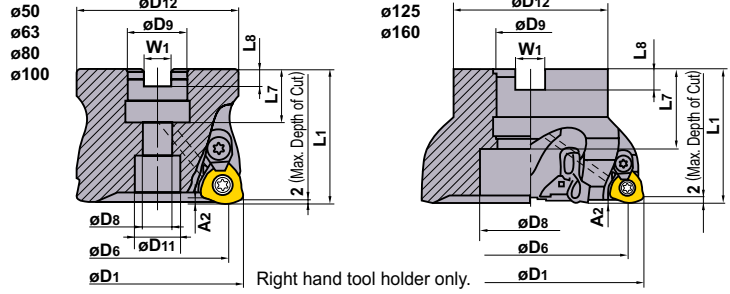
- VP30RT A combination of a tough, special cemented carbide substrate and MIRACLE coating. Ideal for heavy interrupted cutting of stainless and general steels.
- MIRACLE® coating (Al,Ti)N
- A tough, special cemented carbide substrate

High Feed Radius Milling Cutter

AJX

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	➔			

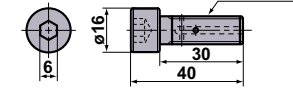
Arbor Type



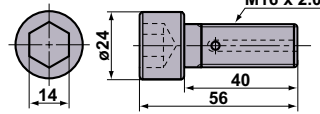
Right hand tool holder only.

Set Bolt

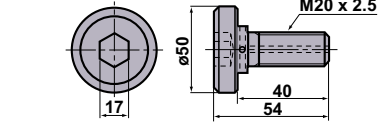
HSC10030H



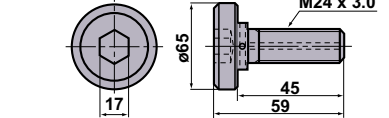
HSC16040H



MBA20040H

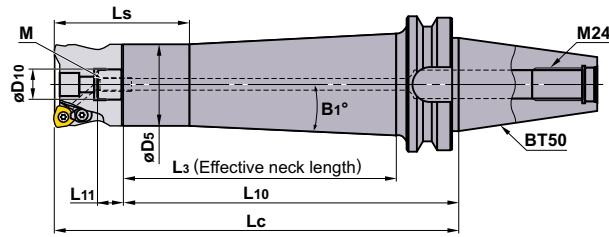


MBA24045H



Type	Order Number	Stock	Number of Teeth	Dimensions (mm)										Mass (kg)	Tools							
				D1	D6	D8	D9	D11	D12	L1	L7	L8	W1		A2	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Set Bolt	Insert
Coarse Pitch	AJX12-050A03R	●	3	50	38.3	11	22	17	47	50	20	6.3	10.4	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM 120420 ZDSR
	R05003B	●	3	50	38.3	11	22.225	17	47	50	19	5	8.4	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM 120420 ZDSR
	AJX14-063A03R	●	3	63	51.1	11	22	17	60	50	20	6.3	10.4	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	JDM 140520 ZDSR
	R06303B	●	3	63	51.1	11	22.225	17	60	50	19	5	8.4	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	
	R08004D	●	4	80	68.1	17	31.75	26	76	63	32	8	12.7	2	1.3	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC160 40H	
	R10005D	●	5	100	88.1	17	31.75	26	96	63	32	8	12.7	2	2.4	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC160 40H	
R12505E	●	5	125	113.2	56	38.1	—	100	63	40	10	15.9	2	3.3	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	MBA200 40H		
R16006F	●	6	160	148.2	72	50.8	—	100	63	43	11	19	2	5.0	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	MBA240 45H		
Fine Pitch	AJX12-050A04R	●	4	50	38.3	11	22	17	47	50	20	6.3	10.4	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM 120420 ZDSR
	R05004B	●	4	50	38.3	11	22.225	17	47	50	19	5	8.4	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM 120420 ZDSR
	AJX14-063A04R	●	4	63	51.1	11	22	17	60	50	20	6.3	10.4	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	JDM 140520 ZDSR
	R06304B	●	4	63	51.1	11	22.225	17	60	50	19	5	8.4	2	0.7	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC100 30H	
	R08005D	●	5	80	68.1	17	31.75	26	76	63	32	8	12.7	2	1.3	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC160 40H	
	R10006D	●	6	100	88.1	17	31.75	26	96	63	32	8	12.7	2	2.4	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	HSC160 40H	
R12507E	●	7	125	113.2	56	38.1	—	100	63	40	10	15.9	2	3.3	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	MBA200 40H		
R16008F	●	8	160	148.2	72	50.8	—	100	63	43	11	19	2	5.0	TS54	AMS5	AJS50 14T25	ASS3	①TKY25T	MBA240 45H		
Extra Fine Pitch	AJX09-050A05R	●	5	50	40	11	22	17	47	50	20	6.3	10.4	1	0.5	TS351	AMS3	AJS30 10T10	ASS2	②TKY10D	HSC100 30H	JDM 09T320 ZDSR
	R05005B	●	5	50	40	11	22.225	17	47	50	19	5	8.4	1	0.5	TS351	AMS3	AJS30 10T10	ASS2	②TKY10D	HSC100 30H	JDM 09T320 ZDSR
	AJX12-063A05R	●	5	63	51.3	11	22	17	60	50	20	6.3	10.4	1.5	0.9	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM 120420 ZDSR
	R06305B	●	5	63	51.3	11	22.225	17	60	50	19	5	8.4	1.5	0.9	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	
	R08006D	●	6	80	68.3	17	31.75	26	76	63	32	8	12.7	1.5	1.7	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC160 40H	
R10007D	●	7	100	88.3	17	31.75	26	96	63	32	8	12.7	1.5	2.9	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC160 40H		

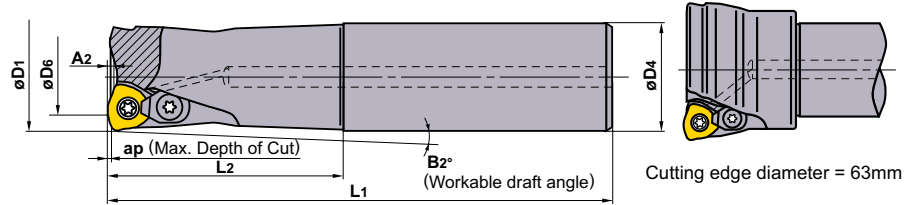
BT50 Shank Arbor



With through coolant supplied as standard.







Order Number	Stock	Dimensions (mm)								Taper Angle B1°	Mass (kg)	Set Bolt	Holder
		L10	L3	Lc	Ls	L11	D10	D5	M				
BT50-22-198-50TA	●	198	150	248	100	18	22	47	M10	3°	5.9	HSC10030H	AJX09-050A..R AJX12-050A..R
BT50-22-248-50TA	●	248	200	298	100	18	22	47	M10	2°30'	6.9	HSC10030H	AJX09-050A..R AJX12-050A..R
BT50-22-298-50TA	●	298	250	348	100	18	22	47	M10	2°	7.8	HSC10030H	AJX09-050A..R AJX12-050A..R
BT50-22.225-198-50TA	●	198	150	248	100	17	22.225	47	M10	3°	5.9	HSC10030H	AJX09R050..B AJX12R050..B
BT50-22-198-63TA	●	198	150	248	100	18	22	60	M10	3°	7.4	HSC10030H	AJX12-063A..R AJX14-063A..R
BT50-22-298-63TA	●	298	250	348	100	18	22	60	M10	2°	10.2	HSC10030H	AJX12-063A..R AJX14-063A..R
BT50-22-398-63TA	●	398	350	448	100	18	22	60	M10	2°	14.0	HSC10030H	AJX12-063A..R AJX14-063A..R
BT50-22.225-198-63TA	●	198	150	248	100	17	22.225	60	M10	3°	7.4	HSC10030H	AJX12R063..B AJX14R063..B
BT50-31.75-235-80TA	●	235	187	298	113	30	31.75	76	M16	2°30'	11.1	HSC16040H	AJX12R080..D AJX14R080..D
BT50-31.75-315-80TA	●	315	267	378	113	30	31.75	76	M16	2°	14.7	HSC16040H	AJX12R080..D AJX14R080..D
BT50-31.75-385-80TA	●	385	337	448	113	30	31.75	76	M16	2°	18.4	HSC16040H	AJX12R080..D AJX14R080..D
BT50-31.75-235-100SA	●	235	187	298	—	30	31.75	96	M16	—	14.4	HSC16040H	AJX12R100..D AJX14R100..D
BT50-31.75-315-100SA	●	315	267	378	—	30	31.75	96	M16	—	18.8	HSC16040H	AJX12R100..D AJX14R100..D
BT50-31.75-385-100SA	●	385	337	448	—	30	31.75	96	M16	—	22.6	HSC16040H	AJX12R100..D AJX14R100..D

Shank Type



Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Insert
				D1	D4	D6	L1	L2	ap	A2	B2°							
Short	AJX06R162SA16SS	●	2	16	16	8.9	70	20	1.0	0.3	3°30'	TS25	—	—	—	①TKY08F	JOM06	
	172SA16SS	●	2	17	16	9.9	70	20	1.0	0.3	—	TS25	—	—	—	①TKY08F	T215ZZSR	
Standard	AJX06R162SA16S	●	2	16	16	8.9	110	30	1.0	0.3	2°15'	TS25	—	—	—	①TKY08F	JOM06 T215ZZSR	
	172SA16S	●	2	17	16	9.9	110	20	1.0	0.3	—	TS25	—	—	—	①TKY08F		
	NEW 203SA20S	●	3	20	20	12.9	130	50	1.0	0.3	1°18'	TS25	—	—	—	①TKY08F		
	NEW 223SA20S	●	3	22	20	14.9	130	30	1.0	0.3	—	TS25	—	—	—	①TKY08F		
	AJX08R202SA20S	●	2	20	20	11.4	130	50	1.5	0.5	1°18'	TS33	—	—	—	②TKY08D	JOM080 320ZZSR	
	222SA20S	●	2	22	20	13.4	130	30	1.5	0.5	—	TS33	—	—	—	②TKY08D		
	NEW 253SA25S	●	3	25	25	16.4	140	60	1.5	0.5	1°06'	TS33	—	—	—	②TKY08D		
	NEW 283SA25S	●	3	28	25	19.4	140	40	1.5	0.5	—	TS33	—	—	—	②TKY08D		
	AJX09R252SA25S	●	2	25	25	14.9	140	60	2.0	1.0	1°06'	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM09T 320ZDSR	
	282SA25S	●	2	28	25	17.9	140	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D		
	NEW 303SA32S	●	3	30	32	20.0	150	70	2.0	1.0	1°48'	TS351	AMS3	AJS3010T10	ASS2	②TKY10D		
	NEW 323SA32S	●	3	32	32	21.9	150	70	2.0	1.0	0°56'	TS351	AMS3	AJS3010T10	ASS2	②TKY10D		
	NEW 353SA32S	●	3	35	32	24.9	150	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D		
	NEW 404SA32S	●	4	40	32	29.9	150	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D		
	AJX12R302SA32S	●	2	30	32	18.3	150	70	2.0	1.5	1°48'	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	JDM120420 ZDSR	
	322SA32S	●	2	32	32	20.3	150	70	2.0	1.5	1°	TS43	AMS4	AJS4012T15	ASS2	②TKY15D		
	352SA32S	●	2	35	32	23.3	150	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D		
	403SA32S	●	3	40	32	28.3	150	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D		
403SA42S	●	3	40	42	28.3	150	70	2.0	1.5	1°48'	TS43	AMS4	AJS4012T15	ASS2	②TKY15D			
AJX14R503SA42S	●	3	50	42	38.2	150	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	②TKY25D	JDM140 520ZDSR		
634SA42S	●	4	63	42	51.2	150	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	②TKY25D			

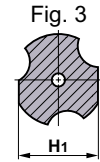
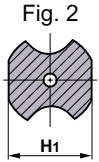
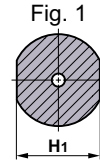
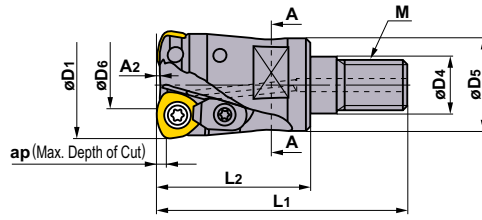
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)														
				R	D1	D4	D6	L1	L2	ap	A2	B2°	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Insert
Long	AJX06R162SA16L	●	2	16	16	8.9	150	70	1.0	0.3	0°56'	TS25	—	—	—	⊙TKY08F	JOM 06 T215ZZSR	
	172SA16L	●	2	17	16	9.9	150	20	1.0	0.3	—	TS25	—	—	—	⊙TKY08F		
	NEW 203SA20L	●	3	20	20	12.9	180	100	1.0	0.3	0°38'	TS25	—	—	—	⊙TKY08F		
	NEW 223SA20L	●	3	22	20	14.9	180	30	1.0	0.3	—	TS25	—	—	—	⊙TKY08F		
	AJX08R202SA20L	●	2	20	20	11.4	180	100	1.5	0.5	0°36'	TS33	—	—	—	⊙TKY08D	JOM 080 320ZZSR	
	222SA20L	●	2	22	20	13.4	180	30	1.5	0.5	—	TS33	—	—	—	⊙TKY08D		
	NEW 253SA25L	●	3	25	25	16.4	200	120	1.5	0.5	0°32'	TS33	—	—	—	⊙TKY08D		
	NEW 283SA25L	●	3	28	25	19.4	200	40	1.5	0.5	—	TS33	—	—	—	⊙TKY08D		
	AJX09R252SA25L	●	2	25	25	14.9	200	120	2.0	1.0	0°30'	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D	JDM 09T 320ZDSR	
	282SA25L	●	2	28	25	17.9	200	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D		
	NEW 303SA32L	●	3	30	32	20.0	200	120	2.0	1.0	1°02'	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D		
	NEW 323SA32L	●	3	32	32	21.9	200	120	2.0	1.0	0°32'	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D		
	NEW 353SA32L	●	3	35	32	24.9	200	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D		
	NEW 404SA32L	●	4	40	32	29.9	250	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D		
	NEW 404SA42L	●	4	40	42	29.9	250	70	2.0	1.0	1°48'	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D		
	AJX12R302SA32L	●	2	30	32	18.3	200	120	2.0	1.5	1°	TS407	AMS4	AJS4012T15	ASS2	⊙TKY15D	JDM 120420 ZDSR	
	322SA32L	●	2	32	32	20.3	200	120	2.0	1.5	0°36'	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D		
	352SA32L	●	2	35	32	23.3	200	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D		
	403SA32L	●	3	40	32	28.3	250	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D		
	403SA42L	●	3	40	42	28.3	250	70	2.0	1.5	1°48'	TS43	AMS4	AJS4012T15	ASS2	⊙TKY25D		
	AJX14R503SA42L	●	3	50	42	38.1	250	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	⊙TKY25D	JDM 140 520ZDSR	
	634SA42L	●	4	63	42	51.1	250	50	2.0	2.0	—	TS54	AMS5	AJS5014T25	ASS3	⊙TKY25D		
	Extra Long	AJX06R162SA16EL	●	2	16	16	8.9	200	100	1.0	0.3	0°38'	TS25	—	—	—	⊙TKY08F	JOM 06 T215ZZSR
		172SA16EL	●	2	17	16	9.9	200	20	1.0	0.3	—	TS25	—	—	—	⊙TKY08F	
AJX08R202SA20EL		●	2	20	20	11.4	250	130	1.5	0.5	0°30'	TS33	—	—	—	⊙TKY08D	JOM 080 320ZZSR	
222SA20EL		●	2	22	20	13.4	250	30	1.5	0.5	—	TS33	—	—	—	⊙TKY10D		
AJX09R252SA25EL		●	2	25	25	14.9	300	180	2.0	1.0	0°18'	TS351	AMS3	AJS3010T10	ASS2	⊙TKY10D	JDM 09T 320ZDSR	
282SA25EL		●	2	28	25	17.9	300	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	⊙TKY15D		
AJX12R302SA32EL		●	2	30	32	18.3	300	180	2.0	1.5	0°42'	TS407	AMS4	AJS4012T15	ASS2	⊙TKY15D	JDM 120420 ZDSR	
322SA32EL		●	2	32	32	20.3	300	180	2.0	1.5	0°24'	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D		
352SA32EL		●	2	35	32	23.3	300	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D		
402SA32EL		●	2	40	32	28.3	350	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D		
402SA42EL	●	2	40	42	28.3	350	70	2.0	1.5	1°48'	TS43	AMS4	AJS4012T15	ASS2	⊙TKY15D			

High Feed Radius Milling Cutter

AJX

Screw-in Type

NEW



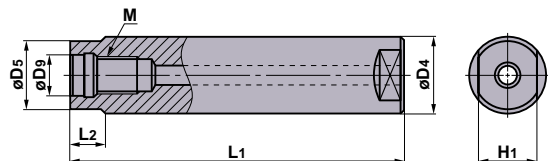
SECTION A-A

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)										Figure	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Insert
			D1	D4	D5	D6	L1	L2	H1	M	ap	A2							
AJX06R162AM0830	●	2	16	8.5	13	8.9	48	30	10	M8	1.0	0.3	1	TS25	—	—	—	①TKY08F	JOM 06 T215ZZSR
172AM0830	●	2	17	8.5	13	9.9	48	30	10	M8	1.0	0.3	1	TS25	—	—	—	①TKY08F	
203AM1030	●	3	20	10.5	18	12.9	49	30	14	M10	1.0	0.3	3	TS25	—	—	—	①TKY08F	
223AM1030	●	3	22	10.5	18	14.9	49	30	14	M10	1.0	0.3	3	TS25	—	—	—	①TKY08F	
AJX08R202AM1030	●	2	20	10.5	18	11.4	49	30	14	M10	1.5	0.5	2	TS33	—	—	—	①TKY08D	JOM 080 320ZZSR
222AM1030	●	2	22	10.5	18	13.4	49	30	14	M10	1.5	0.5	2	TS33	—	—	—	①TKY08D	
253AM1235	●	3	25	12.5	21	16.4	57	35	19	M12	1.5	0.5	1	TS33	—	—	—	①TKY08D	
283AM1235	●	3	28	12.5	21	19.4	57	35	19	M12	1.5	0.5	1	TS33	—	—	—	①TKY08D	
AJX09R252AM1235	●	2	25	12.5	21	14.9	57	35	19	M12	2.0	1.0	2	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM 09T 320ZDSR
282AM1235	●	2	28	12.5	21	17.9	57	35	19	M12	2.0	1.0	2	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
303AM1645	●	3	30	17.0	29	20.0	68	45	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
323AM1645	●	3	32	17.0	29	21.9	68	45	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
353AM1645	●	3	35	17.0	29	24.9	68	45	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
404AM1645	●	4	40	17.0	29	29.9	68	45	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
AJX12R302AM1645	●	2	30	17.0	29	18.3	68	45	24	M16	2.0	1.5	2	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	JDM 120420 ZDSR
322AM1645	●	2	32	17.0	29	20.3	68	45	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
352AM1645	●	2	35	17.0	29	23.3	68	45	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
403AM1645	●	3	40	17.0	29	28.3	68	45	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	

Straight Shank Arbor

NEW



Type	Order Number	Stock	Dimensions (mm)						
			D9	D4	D5	L1	L2	H1	M
Steel Shank	SC16M08S100S	●	8.5	16	14.5	100	10	10	M8
	08S200L	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120S	●	10.5	20	18.5	120	10	14	M10
	10S220L	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125S	●	12.5	25	23.5	125	10	19	M12
	12S245L	●	12.5	25	23.5	245	10	19	M12
Carbide Shank	SC32M16S140S	●	17	32	28.5	140	15	24	M16
	16S280L	●	17	32	28.5	280	15	24	M16
	SC16M08S100SW	●	8.5	16	14.5	100	10	10	M8
	08S200LW	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120SW	●	10.5	20	18.5	120	10	14	M10
	10S220LW	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125SW	●	12.5	25	23.5	125	10	19	M12
	12S245LW	●	12.5	25	23.5	245	10	19	M12
SC32M16S140SW	●	17	32	28.5	140	15	24	M16	
16S280LW	●	17	32	28.5	280	15	24	M16	

● : Inventory maintained.

● BT30 Shank Arbor

NEW

	Order Number	Stock	Dimensions (mm)				
			D9	D5	L10	L2	M
	SC16M08S10-BT30	●	8.5	14.5	32	10	M8
	20M10S10-BT30	●	10.5	18.5	32	10	M10
	25M12S10-BT30	●	12.5	23.5	32	10	M12
	32M16S10-BT30	●	17.0	28.5	32	10	M16

● BT40 Shank Arbor

NEW

	Order Number	Stock	Dimensions (mm)				
			D9	D5	L10	L2	M
	SC16M08S10-BT40	●	8.5	14.5	37	10	M8
	20M10S10-BT40	●	10.5	18.5	37	10	M10
	25M12S10-BT40	●	12.5	23.5	37	10	M12
	32M16S10-BT40	●	17.0	28.5	37	10	M16

● HSK63A Shank Arbor

NEW

	Order Number	Stock	Dimensions (mm)				
			D9	D5	L10	L2	M
	SC16M08S22-HSK63A	●	8.5	14.5	48	22	M8
	20M10S24-HSK63A	●	10.5	18.5	50	24	M10
	25M12S27-HSK63A	●	12.5	23.5	53	27	M12
	32M16S28-HSK63A	●	17.0	28.5	54	28	M16

Inserts

Shape	Order Number	Class	Coated			Dimensions (mm)					Geometry
			FH7020	VP15TF	VP30RT	B ₃ °	D ₁	S ₁	F ₁	Re	
	JOMW06T215ZZSR-FT	M	●	●	●	13°	6.35	2.78	1.2	1.5	
	080320ZZSR-FT	M	●	●	●	13°	8	3.18	1.4	2	
	JDMW09T320ZDSR-FT	M	●	●	●	15°	9.525	3.97	1.8	2	
	120420ZDSR-FT	M	●	●	●	15°	12	4.76	2.5	2	
	140520ZDSR-FT	M	●	●	●	15°	14	5.56	2.8	2	
	JDMT120420ZDSR-ST	M	●	●	●	15°	12	4.76	2.5	2	
	140520ZDSR-ST	M	●	●	●	15°	14	5.56	2.8	2	
	JOMT06T215ZZSR-JM	M	●	●	●	13°	6.35	2.78	1.2	1.5	
	080320ZZSR-JM	M	●	●	●	13°	8	3.18	1.4	2	
	JDMT09T320ZDSR-JM	M	●	●	●	15°	9.525	3.97	1.8	2	
	120420ZDSR-JM	M	●	●	●	15°	12	4.76	2.5	2	
	140520ZDSR-JM	M	●	●	●	15°	14	5.56	2.8	2	

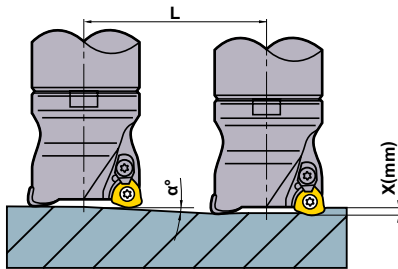
Note) Setting heights for ST chipbreaker and the other chipbreakers differ slightly.
If an ST type chipbreaker is used, please check the tool length offset height.

Recommended Cutting Conditions

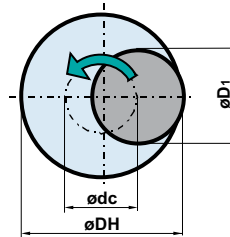
Work Material	Hardness	Grade	Cutting Speed (m/min)	φ16/17			φ20/22			φ25/28		
				Over-hang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Over-hang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Over-hang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)
P Mild Steel	≤180HB	FH7020	170 (120–220)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.6	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
				140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
Alloy Steel	280–350HB	FH7020	130 (80–180)	210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
				140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
Alloy Tool Steel	≤350HB	FH7020	120 (80–160)	180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
				210	0.3	0.3	240	0.4	0.4	290	0.4	0.6
Pre-hardened Steel	≤35HRC	FH7020	120 (80–160)	140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
	35–43HRC	VP15TF	100 (70–130)	180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
M Stainless Steel	≤270HB	VP30RT	120 (80–160)	210	0.3	0.3	240	0.4	0.4	290	0.4	0.6
				140	0.8	0.7	160	1.0	0.8	170	1.0	1.0
				180	0.6	0.5	210	0.8	0.6	230	0.8	0.8
K Cast Iron	Tensile Strength ≤350MPa	FH7020	150 (100–200)	210	0.4	0.6	240	0.6	0.8	290	0.6	1.0
				140	0.8	1.0	160	1.0	1.2	170	1.0	1.4
				180	0.6	0.8	210	0.8	1.0	230	0.8	1.2
Ductile Cast Iron	Tensile Strength ≤800MPa	VP15TF	120 (80–160)	210	0.4	0.6	240	0.6	0.8	290	0.6	1.0
				140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
H Hardened Steel	43–55HRC	VP15TF	70 (50–90)	210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
				140	0.5	0.5	160	0.5	0.6	170	0.5	0.8
				180	0.4	0.3	210	0.4	0.4	230	0.4	0.6
				210	0.3	0.2	240	0.3	0.2	290	0.3	0.4

Maximum Capacities

Ramping



Helical Cutting



- How to derive a locus of the center of the tool.

$$\phi dC = \phi DH - \phi D1$$

Locus of the center of the tool Desired hole diameter Cutting diameter

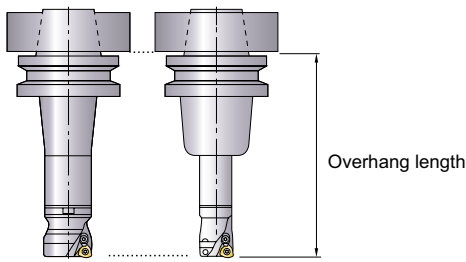
- Please set the depth of cut per cycle under max. depth of cut (ap).
- Please machine in a down cutting direction (climb milling).

- When ramping and helical cutting, please apply a lower feed (60% of the calculated feed rate or less).
- When drilling, please set the feed in the axial direction 0.2mm/rev or less.
- The long chips generated can disperse in any direction, ensure adequate safety precautions are taken.

Type	Order Number	Tool Diameter (mm)	Machined Face Diameter (mm)	Max. Depth of Cut ap (mm)	Ramp Machining			Helical Cutting		Max. Drilling Depth A2 (mm)	
					Max. Angle	Required Distance for X mm Depth L (mm)		Min. Hole Diameter DH (mm)	Max. Hole Diameter DH (mm)		
						X=1	X=1.5				X=2
Shank Type / Screw-in Type	AJX06R162	16	8	1.0	3°	19.1	—	—	23	29	0.3
	06R172	17	9	1.0	2°30'	22.9	—	—	25	31	0.3
	06R203	20	12	1.0	1°30'	38.2	—	—	31	37	0.3
	06R223	22	14	1.0	1°	57.3	—	—	35	41	0.3
	08R202	20	11	1.5	3°30'	16.3	24.5	—	27	36	0.5
	08R222	22	13	1.5	3°	19.1	28.6	—	31	40	0.5
	08R253	25	16	1.5	2°	28.6	43.0	—	37	46	0.5
	08R283	28	19	1.5	1°42'	33.7	50.5	—	43	52	0.5
	09R252	25	14	2.0	4°	14.3	21.5	28.6	33	46	1.0
	09R282	28	17	2.0	3°	19.1	28.6	38.1	39	52	1.0
	09R303	30	19	2.0	2°42'	21.2	31.8	42.4	43	56	1.0
	09R323	32	21	2.0	2°30'	22.9	34.4	45.8	47	60	1.0
	09R353	35	24	2.0	2°	28.6	43.0	57.3	53	66	1.0
	09R404	40	29	2.0	1°30'	38.2	57.3	76.4	63	76	1.0
	12R302	30	18	2.0	4°30'	12.7	19.0	25.4	39	56	1.5
	12R322	32	20	2.0	4°	14.3	21.4	28.6	41	60	1.5
	12R352	35	23	2.0	3°30'	16.3	24.5	32.7	47	66	1.5
	12R402	40	28	2.0	3°	19.1	28.6	38.2	57	76	1.5
12R403	40	28	2.0	3°	19.1	28.6	38.2	57	76	1.5	
14R503	50	38	2.0	4°12'	13.6	20.4	27.2	72	96	2.0	
14R634	63	51	2.0	2°48'	20.4	30.7	40.9	98	122	2.0	
Arbor Type	AJX09-050	50	40	2.0	1°06'	52.1	78.1	104.2	83	96	1.0
	09R05005B	50	40	2.0	1°06'	52.1	78.1	104.2	83	96	1.0
	12-050	50	38	2.0	2°	28.6	43.0	57.3	77	96	1.5
	R050	50	38	2.0	2°	28.6	43.0	57.3	77	96	1.5
	12-063	63	51	2.0	1°30'	38.2	57.3	76.4	103	122	1.5
	R063	63	51	2.0	1°30'	38.2	57.3	76.4	103	122	1.5
	R080	80	68	2.0	1°06'	52.1	78.1	104.2	137	156	1.5
	R100	100	88	2.0	0°48'	71.6	107.4	143.2	177	196	1.5
	AJX14-063	63	51	2.0	2°48'	20.4	30.7	40.9	98	122	2.0
	R063	63	51	2.0	2°48'	20.4	30.7	40.9	98	122	2.0
	R080	80	68	2.0	1°48'	31.8	47.7	63.6	132	156	2.0
	R100	100	88	2.0	1°12'	47.7	71.6	95.5	172	196	2.0
	R125	125	113	2.0	0°48'	71.6	107.4	143.2	222	246	2.0
	R160	160	148	2.0	0°30'	114.6	171.9	229.2	292	316	2.0

φ30/32/35			φ40 (φ32 Shank)			φ40 (φ42 Shank)			φ50/63 (Shank type)			φ50/63 (Arbor type)			φ80/100/125/160 (Arbor type)		
Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)
180	1.2	1.4	180	1.2	1.4	180	1.2	1.5	180	1.4	1.5	150	1.5	1.5	170	1.5	1.5
230	1.0	1.2	240	1.0	1.2	240	1.0	1.3	240	1.2	1.3	250	1.3	1.3	300	1.3	1.3
290	0.8	1.0	300	0.8	1.0	300	0.8	1.1	—	—	—	350	1.1	1.1	450	1.0	1.0
180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	—	—	—	350	0.9	1.1	450	0.8	1.0
180	1.0	1.2	180	1.0	1.2	180	1.0	1.3	180	1.2	1.3	150	1.3	1.3	170	1.3	1.3
230	0.8	1.0	240	0.8	1.0	240	0.8	1.1	240	1.0	1.1	250	1.1	1.1	300	1.1	1.1
290	0.6	0.8	300	0.6	0.8	300	0.6	0.9	—	—	—	350	0.9	0.9	450	0.8	0.8
180	1.2	1.2	180	1.2	1.2	180	1.2	1.3	180	1.4	1.3	150	1.5	1.3	170	1.5	1.3
230	1.0	1.0	240	1.0	1.0	240	1.0	1.1	240	1.2	1.1	250	1.3	1.1	300	1.3	1.1
290	0.8	0.8	300	0.8	0.8	300	0.8	0.9	—	—	—	350	1.1	0.9	450	1.0	0.8
180	1.2	1.6	180	1.2	1.6	180	1.2	1.7	180	1.4	1.7	150	1.5	1.7	170	1.5	1.7
230	1.0	1.4	240	1.0	1.4	240	1.0	1.5	240	1.2	1.5	250	1.3	1.5	300	1.3	1.5
290	0.8	1.2	300	0.8	1.2	300	0.8	1.3	—	—	—	350	1.1	1.3	450	1.0	1.2
180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	—	—	—	350	0.9	1.1	450	0.8	1.0
180	0.6	1.0	180	0.6	1.0	180	0.6	1.1	180	0.8	1.1	150	0.9	1.1	170	0.9	1.1
230	0.5	0.8	240	0.5	0.8	240	0.5	0.9	240	0.6	0.9	250	0.7	0.9	300	0.7	0.9
290	0.4	0.6	300	0.4	0.6	300	0.4	0.7	—	—	—	—	—	—	—	—	—

① Overhang length



② Main spindle revolution

$$N(\text{min}^{-1}) = (\text{Recommended cutting speed} \times 1000) \div (\text{outer tool diameter} \times 3.14)$$

③ Table feed rate

$$vf(\text{mm/min}) = N \times \text{feed per tooth} \times \text{number of teeth}$$

④ Recommended width of cut (ae) is more than 60% of cutter diameter.

⑤ The above cutting conditions are a guide when using a BT50 size holder. In case of BT40 and HSK63 machines, a cutter diameter of under 35mm is recommended. In this case, reduce the depth of cut and table feed rate.

⑥ Use of **ST** chipbreaker with a tougher cutting edge is recommended for interrupted cutting. The first recommended insert grade for non-standard 08/09 **ST** chipbreakers is **VP30RT** irrespective of workpiece materials.

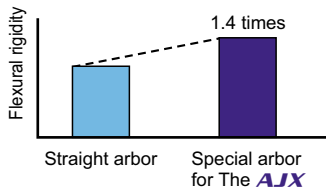
⑦ A cutter body with a coarse pitch is recommended for use in unstable conditions such as a long tool overhang.

⑧ Use "sharp" **JM** chipbreaker to lower cutting forces or when there is a long tool overhang.

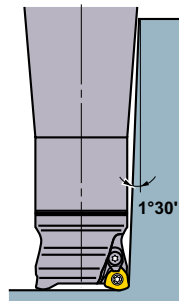
⑨ Large chips are generated when machining with the **AJX**. To avoid a chip jamming-related problems, machine using an air blow to disperse the chips effectively.

Effective Use

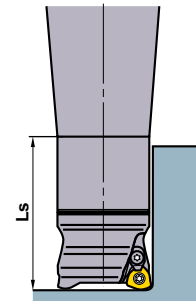
The special arbors for the **AJX** use a tapered body, and thereby achieve improved rigidity when compared to straight arbors.



*BT50-22-298-50TA

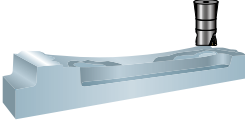
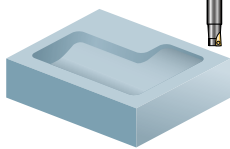
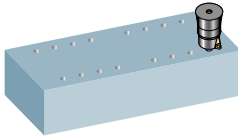
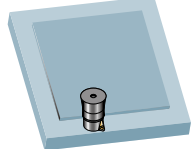


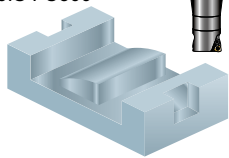
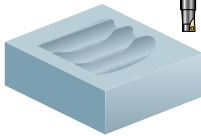
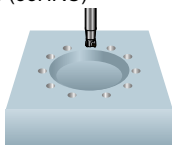
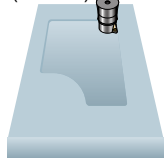
The 1°30' draft angle of the special tapered body of the arbor enables machining without touching finished wall.



Vertical wall machining is possible within the range of Ls.

Application Example

Tool (Grade)		AJX14-063A04R FT breaker (FH7020)	AJX09R323SA32S FT breaker (VP30RT)	AJX14R08004D ST breaker (FH7020)	AJX14R10006D FT breaker (VP30RT)	
Workpiece		JIS S55C (220HB) 	JIS SKD11 (56HRC) 	JIS S50C (200HB) 	JIS SUS304 (200HB) 	
Component		Resin mould	Press mould	Resin mould	Electronics part manufacturing device component	
Cutting Conditions	Cutting Speed (Revolution)	178m/min(900min ⁻¹)	100m/min(995min ⁻¹)	150m/min(597min ⁻¹)	120m/min(382min ⁻¹)	
	Feed (Feed per Tooth)	4000mm/min(1.1mm/tooth)	1200mm/min(0.4mm/tooth)	4776mm/min(2.0mm/tooth)	2292mm/min(1.0mm/tooth)	
	Depth of Cut (mm)	ap (Axial)	1.5	0.35	1.5	1
		ae (Radial)	45	18	-50	60
Overhang length (mm)	248	170	213	138		
Coolant		Air blow	Air blow	Air blow	Wet cutting	
Result		Compared to a conventional product whose tool life was 2 hours, the AJX improved tool life by 3 hours. Realization of long tool life achieves great cost reductions.	Use of the AJX extra fine pitch type allows for high feed machining and increases the metal removal rate by 44%. Longer insert life and improved productivity.	The workpiece was perforated and conventional inserts suffered from fracturing. The ST chipbreaker with tougher cutting edges did not fracture, making un-manned machining possible.	Although the work was a thin stainless plate, the AJX displayed stable cutting performance without suffering from vibrations. The AJX achieved 3 times longer tool life than a conventional product.	

Tool (Grade)		AJX14R08005D FT breaker (FH7020)	AJX12R403SA32S ST breaker (VP15TF)	AJX09R252SA25S JM breaker (FH7020)	AJX08R222SA20L FT breaker (VP15TF)	
Workpiece		JIS FC300 	JIS SKD61 (48-52HRC) 	PX-5 (33HRC) 	DH31-S (48HRC) 	
Component		Press mould	Forging mould	Resin mould	Die casting mould	
Cutting Conditions	Cutting Speed (Revolution)	196m/min(780min ⁻¹)	60m/min(477min ⁻¹)	150m/min(1911min ⁻¹)	70m/min(1013min ⁻¹)	
	Feed (Feed per Tooth)	4000mm/min(1.0mm/tooth)	1145mm/min(0.8mm/tooth)	4969mm/min(1.3mm/tooth)	1620mm/min(0.8mm/tooth)	
	Depth of Cut (mm)	ap (Axial)	2	1	0.8	1
		ae (Radial)	50	-30	12	9
Overhang length (mm)	298	200	170	200		
Coolant		Air blow	Air blow	Air blow	Air blow	
Result		Enabled a stable cutting performance despite an uneven machining allowance. FH7020 achieved a longer tool life due to less crater wear of the insert.	Machining recycled moulds with holes or welds, conventional inserts suffered from fracturing. The ST chipbreaker with tougher cutting edges suffered no sudden fracturing.	Possible to use an HSK63 high-speed machining center to full capacity. No fear of workpiece distortion thanks to low cutting resistance and low heat generation of the JM chipbreaker.	High efficiency machining possible even on a high speed machining center with a BT40 main spindle. Manufacturing costs have been slashed by directly machining quenched steel.	

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 spanner. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS CORPORATION



The Scope of the Registration:
Design, Development and
Production of Cemented
Carbide Tools and Carbide
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The Scope of the Registration:
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(Tools specifications subject to change without notice.)