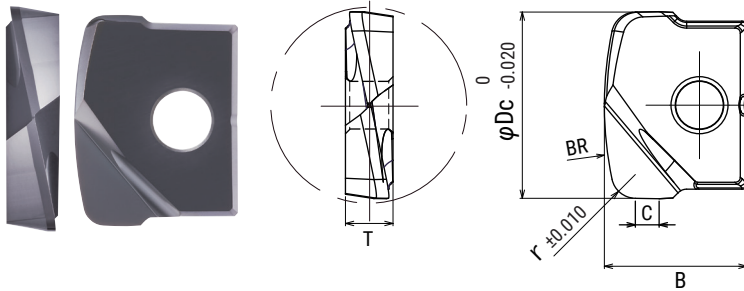


5-AXIS Series

LRM
TYPE

Insert for "MIRROR BARREL" LRM type



Radius form accuracy on the bottom $\pm 0.010\text{mm}$

5
axis

Corner radius accuracy of inserts within $\pm 0.010\text{mm}$

Cat.No.	Grade		Dimensions (mm)					
	JC8015	FZ15	ϕDc	r	BR	B	T	C
LRM-160-R20-BR32	●	●	16	2	32	12	4	2
LRM-200-R30-BR40	●	●	20	3	40	15	5	2
LRM-250-R30-BR50	●	●	25	3	50	18.50	6	2.5
LRM-300-R30-BR60	●	●	30	3	60	22.50	7	3

MBX
TYPE

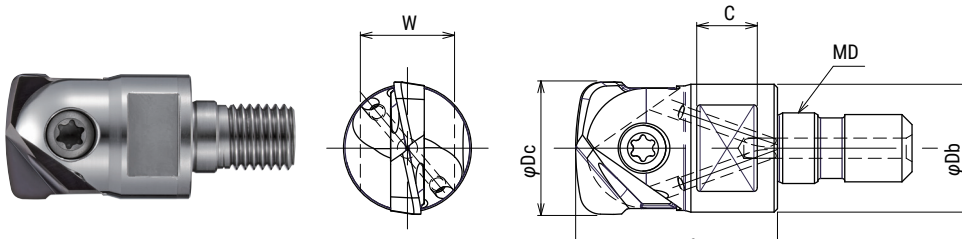
Modular head MBX type

Through coolant hole

Accuracy of MBX after combined O.D. run out: below 15 μm (Target below 10 μm).

When using LRM type insert/Corner radius accuracy: within $\pm 0.010\text{mm}$. Radius form accuracy on the front edge: within $\pm 0.010\text{mm}$.

5
axis



Clamp screw	Torque(N.m)
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	5.0
FSW-8025S	6.0

Cat.No.	Stock	Dimensions (mm)						Inserts		Parts	
		ϕDc	Lf	ϕDb	MD	C	W			Screw	Wrench
MBX-160-M8	●	16	23	15	M8	8	12	BNM-160...	/LRM-160...	FSW-4013H	A-15
MBX-200-M10	●	20	30	19	M10	8	14	BNM-200...	/LRM-200...	FSW-5016H	A-20W
MBX-250-M12	●	25	35	24	M12	10	17	BNM-250...	/LRM-250...	FSW-6020	A-30
MBX-300-M16	●	30	43	29	M16	12.5	22	BNM-300...	/LRM-300...	FSW-8025S	A-30

5-AXIS Series

■ Recommended cutting conditions

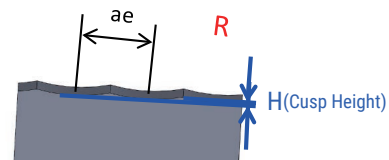


● LRM Type

Material	Grade	Tool dia.(mm)							
		16				20			
		ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460
Cast steel (GM190, ICD5) below 285HB	JC8015	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460
Mold steel (HPM7, PX5, P20) 30-36 HRC	JC8015	0.1	~0.6	7,960	3,980	0.1	~0.7	6,370	3,820
Mold steel (NAK80, HPM1, P21) 38-43HRC	JC8015	0.1	~0.6	6,960	3,480	0.1	~0.7	5,570	3,340
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH102	0.1	~0.5	5,970	2,390	0.1	~0.6	4,770	2,390
Hardened die steel (SKD11, SLD, DC11) 55-62HRC	DH102	0.1	~0.5	4,970	1,990	0.1	~0.6	3,980	1,590
Hardened die steel (SKH,HAP) 55-62HRC	DH102	0.05	~0.25	3,980	1,190	0.05	~0.25	3,180	950
Grey cast iron (FC250) 160-260HB	DH102	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460
Nodular cast iron (FCD700) 170-300HB	DH102	0.15	~0.6	6,960	4,180	0.15	~0.7	5,570	3,900
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.15	~0.6	7,960	3,980	0.15	~0.7	6,370	3,820
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.15	~0.6	7,960	3,980	0.15	~0.7	6,370	3,820
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.1	~0.6	4,970	1,990	0.1	~0.7	3,980	1,990
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.1	~0.25	3,980	1,190	0.1	~0.3	3,180	1,270

Please refer to chart and formula below to calculate ap.

$$ae = 2 \sqrt{(R^2 - (R - H)^2)}$$



Pick amount ap(mm)		Cusp height (mm)									
Cat.No.	R	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
LRM-160-R20-BR32	32	0.51	0.72	0.88	1.01	1.13	1.24	1.34	1.43	1.52	1.60
LRM-200-R30-BR40	40	0.57	0.80	0.98	1.13	1.26	1.39	1.50	1.60	1.70	1.79

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These parameters are for overhang length 3Dc. See right table for longer application.
3. In case of chatter occurring, recommended to reduce ap or rpm and keep feed per tooth.
4. Use air blow.

Overhang (l/Dc)	n (min ⁻¹)	Vf (mm/min)
~ 3Dc	100%	100%
5Dc ~ 10Dc	70%	70%
3Dc ~ 5Dc	50%	50%

5-AXIS Series

Recommended cutting conditions

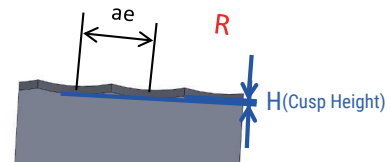


LRM Type

Material	Grade	Tool dia.(mm)							
		25				30			
		ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Cast steel (GM190, ICD5) below 285HB	JC8015	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Mold steel (HPM7, PX5, P20) 30-36 HRC	JC8015	0.1	~0.8	5,730	3,440	0.1	~0.8	4,770	2,860
Mold steel (NAK80, HPM1, P21) 38-43HRC	JC8015	0.1	~0.8	5,090	3,050	0.1	~0.8	4,240	2,540
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH102	0.1	~0.7	4,460	2,230	0.1	~0.7	3,710	1,860
Hardened die steel (SKD11, SLD, DC11) 55-62HRC	DH102	0.1	~0.7	3,820	1,530	0.1	~0.7	3,180	1,270
Hardened die steel (SKH, HAP) 55-62HRC	DH102	0.05	~0.25	2,550	770	0.05	~0.25	2,120	640
Grey cast iron (FC250) 160-260HB	DH102	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Nodular cast iron (FCD700) 170-300HB	DH102	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.15	~0.8	5,730	3,440	0.15	~0.8	4,770	2,860
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.15	~0.8	5,730	3,440	0.15	~0.8	4,770	2,860
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.1	~0.8	3,180	1,590	0.1	~0.8	2,650	1,330
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.1	~0.3	2,550	1,020	0.1	~0.3	2,120	850

Please refer to chart and formula below to calculate ap.

$$ae = 2 \sqrt{(R^2 - (R - H)^2)}$$



Pick amount ap(mm)		Cusp height (mm)									
Cat.No.	R	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
LRM-250-R30-BR50	50	0.63	0.89	1.10	1.26	1.41	1.55	1.67	1.79	1.90	2.00
LRM-300-R30-BR60	60	0.69	0.98	1.20	1.39	1.55	1.70	1.83	1.96	2.08	2.19

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These parameters are for overhang length 3Dc. See right table for longer application.
3. In case of chatter occurring, recommended to reduce ap or rpm and keep feed per tooth.
4. Use air blow.

Overhang (ℓ/Dc)	n (min ⁻¹)	Vf (mm/min)
~ 3Dc	100%	100%
5Dc ~ 10Dc	70%	70%
3Dc ~ 5Dc	50%	50%