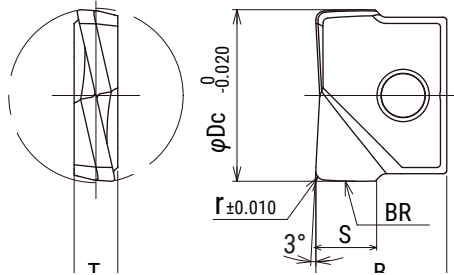


5-AXIS Series



Insert for "MIRROR BARREL" KRM type



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

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

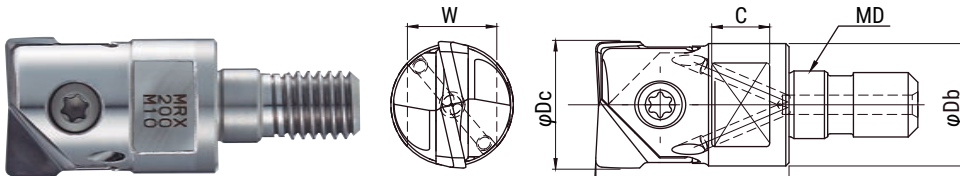


Cat.No.	Grade		Dimensions (mm)					
	JC8015	DH102	ϕDc	r	BR	S	B	T
KRM-160-R10-BR50	●	●	16	1	50	5.7	12	4
KRM-200-R10-BR60	●	●	20	1	60	6.8	15	5
KRM-250-R10-BR60	●	●	25	1	60	7.3	18.5	6
KRM-300-R10-BR60	●	●	30	1	60	9.1	22.5	7



Modular head MRX type

Accuracy of MRX after combined O.D. run out: below $15\mu\text{m}$ (Target below $10\mu\text{m}$).
When using KRM type insert/Corner radius accuracy: within $\pm 0.010\text{mm}$. Radius form accuracy on the outer periphery: within $\pm 0.010\text{mm}$.



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
MRX-160-M8	●	16	23	15	M8	8	12	RNM-160/170... FRM-160/170... /HRM-160/170... /KRM-160...	FSW-4013H	A-15	
MRX-200-M10	●	20	30	19	M10	8	14	RNM-200/210... FRM-200/210... /HRM-200/220... /KRM-200...	FSW-5016H	A-20W	
MRX-250-M12	●	25	25	24	M12	10	17	RNM-250/260... /FRM-250... /KRM-250...	FSW-6020	A-30	
MRX-300-M16	●	30	30	29	M16	12.5	22	RNM-300... /FRM-200/220... /KRM-300...	FSW-8025S	A-30	

5-AXIS Series

■ Recommended cutting conditions

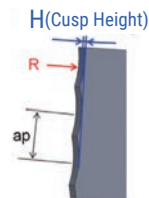
● KRM Type Side finishing



Material	Grade	Tool dia.(mm)							
		16				20			
		a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	0.8	0.15	5,970	2,390	1	0.15	4,770	1,910
Cast steel (GM190, ICD5) below 285HB	JC8015	0.8	0.15	5,970	2,390	1	0.15	4,770	1,910
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.8	0.15	5,970	2,390	1	0.15	4,770	1,910
Mold steel (HPM7, PX5, P20) 30-36 HRC	JC8015	0.8	0.12	5,970	2,390	1	0.12	4,770	1,910
Mold steel (NAK80, HPM1, P21) 38-43HRC	JC8015	0.8	0.12	5,570	1,670	1	0.12	4,460	1,340
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH102	0.6	0.1	4,970	750	0.7	0.1	3,980	600
Hardened die steel (SKD11, SL, DC11) 55-62HRC	DH102	0.5	0.1	3,980	600	0.7	0.1	3,180	480
Grey cast iron (FC250) 160-260HB	DH102	0.8	0.2	6,960	3,480	1	0.2	5,570	3,340
Nodular cast iron (FCD700) 170-300HB	DH102	0.8	0.2	6,960	3,480	1	0.2	5,570	3,340
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.8	0.12	5,570	2,230	1	0.12	4,460	1,780
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.8	0.12	5,570	2,230	1	0.12	4,460	1,780
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.5	0.1	1,990	480	0.6	0.1	1,590	380
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.5	0.1	1,590	380	0.6	0.1	1,270	300

Please refer to chart and formula below to calculate a_p .

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



a_p (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
KRM-160-R10-BR50	50	0.63	0.89	1.10	1.26	1.41	1.55	1.67	1.79	1.90	2.00
KRM-200-R10-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 a_p or rpm and keep feed per tooth.
4. Use air blow.

Overhang (l/D_c)	n (min^{-1})	V_f (mm/min)
$\sim 3D_c$	100%	100%
$3D_c \sim 5D_c$	70%	70%
$5D_c \sim 10D_c$	50%	50%

5-AXIS Series

■ Recommended cutting conditions

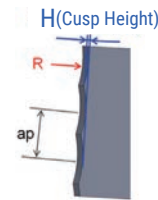


● KRM Type Side finishing

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	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Cast steel (GM190, ICD5) below 285HB	JC8015	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Mold steel (HPM7, PX5, P20) 30-36 HRC	JC8015	1.2	0.12	3,820	1,530	1.2	0.12	3,180	1,270
Mold steel (NAK80, HPM1, P21) 38-43HRC	JC8015	1	0.12	3,570	1,070	1	0.12	2,970	890
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH102	0.8	0.1	3,180	480	0.8	0.1	2,650	400
Hardened die steel (SKD11, SL, DC11) 55-62HRC	DH102	0.7	0.1	2,550	380	0.7	0.1	2,120	320
Grey cast iron (FC250) 160-260HB	DH102	1.2	0.2	4,460	2,680	1.2	0.2	3,710	2,230
Nodular cast iron (FCD700) 170-300HB	DH102	1.2	0.2	4,460	2,680	1.2	0.2	3,710	2,230
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	1.2	0.12	3,570	1,430	1.2	0.12	2,970	1,190
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	1.2	0.12	3,570	1,430	1.2	0.12	2,970	1,190
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.7	0.1	1,270	320	0.7	0.1	1,060	270
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.7	0.1	1,020	260	0.7	0.1	850	210

Please refer to chart and formula below to calculate ap.

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



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
KRM-250-R10-BR60	60	0.69	0.98	1.20	1.39	1.55	1.70	1.83	1.96	2.08	2.19
KRM-300-R10-BR60											

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%
3Dc ~ 5Dc	70%	70%
5Dc ~ 10Dc	50%	50%