

DIEMASTER 5G

High efficient and Multi purpose machining tool for Die and Mold.

FEATURE 1

- Different grade of insert for machining different kind of materials.
- This tool can make all kind of operations, from **semi-finishing** to **finishing**, in any kind of mold.

FEATURE 2

- Economical double-side insert (with 6 cutting edges)
- High accuracy (adopted H-class insert)
- JC8015 for general & mold steel
- DH103 for hardened die steel



ISO	P					M					K				H		
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	H01	H10	H20
Applicable range	JC8015					JC8015					JC8015						
	DH103										DH103				DH103		

**FEATURE 3**

- Many kinds of modular heads are available with combination of carbide shanks.
- Through coolant holes in all bodies give longer tool life and safe operations in cavities.

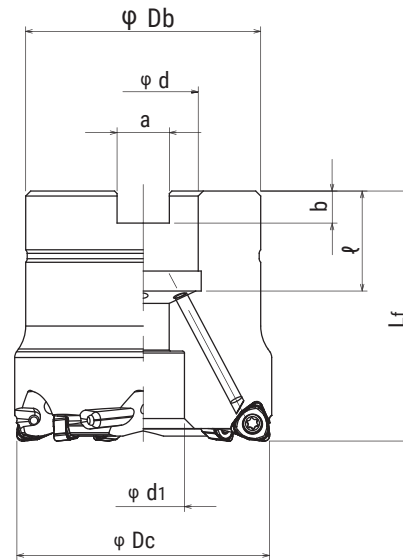


DIEMASTER 5G

MXF/XFG Type

■ **Facemill Type**

Through coolant hole



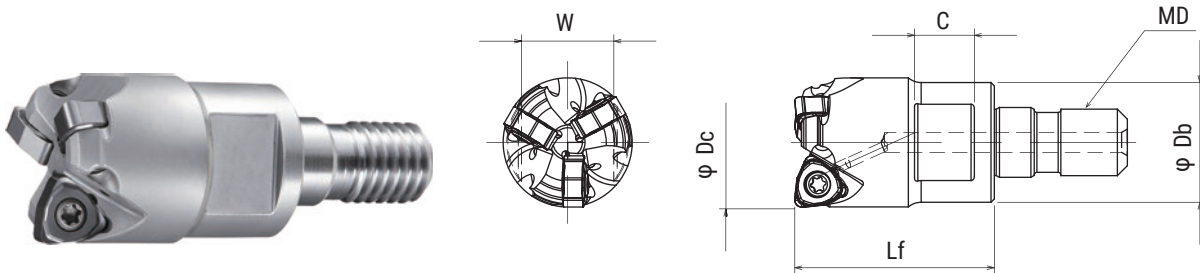
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Inserts
			φDc	Lf	φDb	φd	φd1	a	b	ℓ			
XFG-6052R-22	●	6	52	50	47	22	16.5	10.4	6.3	20	M10	0.56	WNHU04T310ZER
XFG-7066R-27	●	7	66	50	48	27	20.0	12.4	7	22	M12×1.75×30★	0.39	

Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

DIEMASTER 5G **MXF/XFG Type**

■ **Modular Head Type**

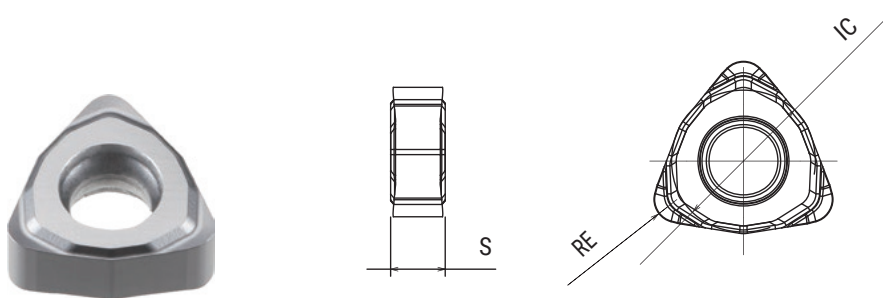
Through coolant hole



Cat.No.	Stock	No. of inserts	Dimensions (mm)						Inserts
			φDc	Lf	φDb	MD	C	W	
MXF-2016-M8	●	2	16	23	14	M8	8	12	WNHU04T310ZER
MXF-3020-M10	●	3	20	30	18	M10	9	14	
MXF-4025-M12	●	4	25	35	22	M12	11	19	
MXF-5035-M16	●	5	35	43	29	M16	12	22	
MXF-6042-M16	●	6	42	43	32	M16	14	26	

Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

■ **Insert**



Cat.No.	Tolerance	PVD coated		Dimensions (mm)		
		DH103	JC8015	RE	IC	S
WNHU04T310ZER	H	●	●	1.0	6.35	3.33

Note: 10 inserts per case.

DIEMASTER 5G

MXF/XFG Type

● Attention

⚠ Attention to mounting head and MSN/ MGN shank arbor.

■ Tightening procedure

① Cleaning

Remove dirt and chips with air from the connecting thread and face of modular head and MSN/MGN shank arbor

② Initial Tightening

Tighten by hand until the head and the shank arbor faces touch.

③ Final Tightening

Tighten slowly with torque control spanner wrench or DIJET DS type spanner wrench and confirm that there is no gap.

Attention: Final tightening without initial tightening cause connecting thread damage.

⚠ NOTE

- Note: 1. Please gently apply pressure on wrench.
- 2. Please confirm that there is no gap between MSN/MGN shank arbor and modular

Thread	Tightening torque	Spanner size W (mm)
M8	16N · m	12 ☆
M10	16N · m	14, 15
M12	20N · m	17, 19
M16	25N · m	22, 26

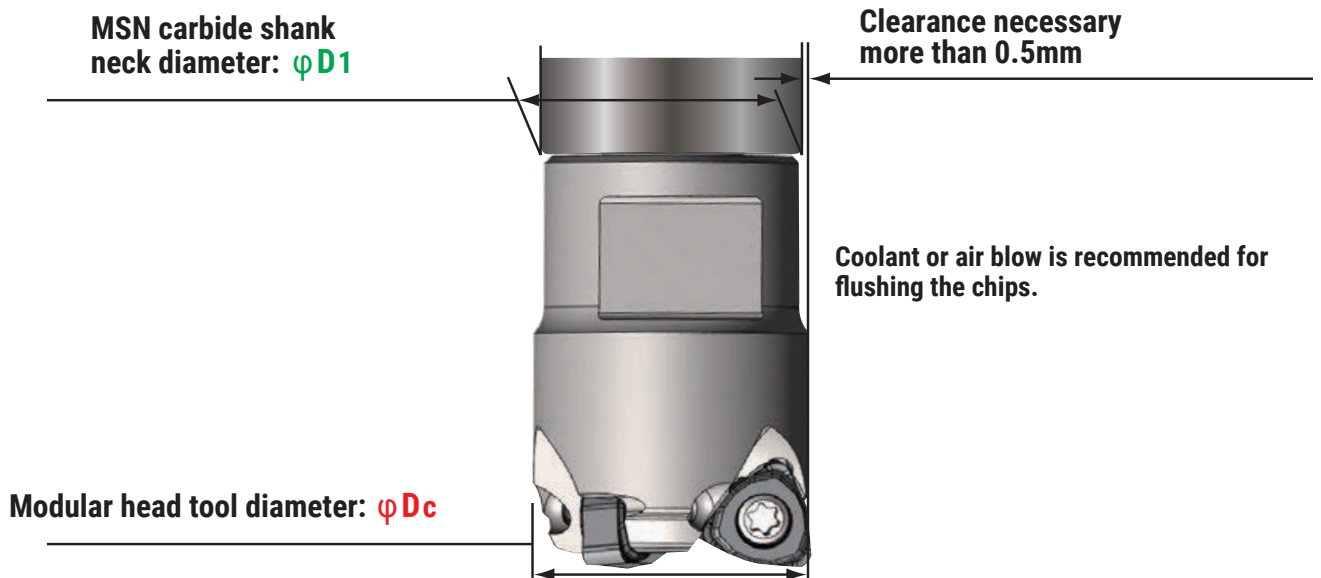
- Note: 1. Modular heads are supplied without spanner wrench.
- 2. In case of choosing torque control spanner wrench, confirm that the wrench size is match to the dimensions W & C of each modular head. (There are some cases that modifying the thickness of spanner wrench is necessary)
- 3. ☆ mark shows: DIJET have a stock of DS-8 and 12 type spanner wrenches.

⚠ Selection of "MSN Carbide shank arbor"

In case of using modular head over $\varphi 16\text{mm}$, please select **MSN carbide shank arbor that diameter ($\varphi D1$) is 1mm or more smaller than modular head (φDc).**

A wrong selection causes damage to the carbide shank.

$$\varphi Dc - \varphi D1 \geq 1\text{mm}$$



⚠ Caution for the mounting to shrink fit holder.

When you use a carbide shank and a modular head on the shrink fit holder, please shrink fit the only the carbide shank without modular head. **Please mount a modular head after cooling off.**

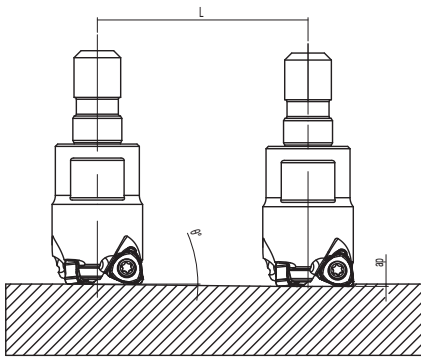
Note: In case of shrink fit MSN shank + modular head together, it will be difficult to loose due to heat desipation.

DIEMASTER 5G

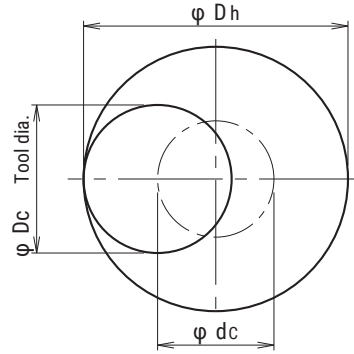
MXF/XFG Type

Attention for profile milling

Ramping



Helical interpolation



● **Calculation of tool pass dia.**

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool dia.

- Depth of cut per one circuit should not exceed max. depth of cut a_p
- Down cutting is recommended, so tool pass rotation should be counterclockwise.
- To obtain a flat bottom surface when helical milling, it requires to remove "the uncut part" in the center of work materials at final pass.

- ⊙ In case of ramping and helical interpolation, apply 80% or less feed speed from standard cutting condition table.
- ⊙ In case of helical interpolation, recommend wet cutting by coolant through the tool.

Cat. No.	Tool dia. (mm)	Max. depth of cut (mm)	Ramping		Helical interpolation			
			Max. ramping angle θ°	Total cutting length at Max. a_p	Through hole Min. bore dia. Dh min (mm)	Through hole Max. bore dia. Dh max (mm)	Flat bottom Max. bore dia. Dh min (mm)	
MXF-2016-M8	16	0.5	0.4	72	28.2	31	29.6	
MXF-3020-M10	20	0.5	0.3	95	36.2	39	37.6	
MXF-4025-M12	25	0.5	0.2	143	46.2	49	47.6	
MXF-5035-M16	35	0.5	0.15	191	66.2	69	67.6	
MXF-6042-M16	42	0.5	0.1	286	80.2	83	81.6	
XFG-6052R-22	52	0.5	0.1	286	100.2	103	101.6	
XFG-7066R-27	66	0.5	Ramping & helical interpolation is not recommended.					

※ Drilling is not recommended.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Side wall finishing

Material	Grade	Tool dia.(mm)							
		16				20			
		2N				3N			
		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	0.3	0.1	5,970	2,390	0.3	0.1	4,770	2,860
Cast steel (GM190, ICD5) below 285HB	JC8015	0.3	0.1	5,970	2,390	0.3	0.1	4,770	2,860
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.3	0.1	5,970	2,390	0.3	0.1	4,770	2,860
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.3	0.1	5,970	2,390	0.3	0.1	4,770	2,860
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.3	0.1	5,570	1,670	0.3	0.1	4,460	2,010
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.3	0.1	4,970	750	0.3	0.1	3,980	900
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.3	0.2	6,960	3,480	0.3	0.2	5,570	4,180
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.3	0.2	6,960	3,480	0.3	0.2	5,570	4,180
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.3	0.1	5,570	2,230	0.3	0.1	4,460	2,680
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.3	0.1	5,570	2,230	0.3	0.1	4,460	2,680
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.25	0.1	1,990	480	0.25	0.1	1,590	570
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.25	0.1	1,590	380	0.25	0.1	1,270	460

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min^{-1}) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min^{-1}) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Side wall finishing

Material	Grade	Tool dia.(mm)							
		25				35			
		4N				5N			
		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	0.3	0.1	3,820	3,060	0.3	0.1	2,730	2,730
Cast steel (GM190, JCD5) below 285HB	JC8015	0.3	0.1	3,820	3,060	0.3	0.1	2,730	2,730
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.3	0.1	3,820	3,060	0.3	0.1	2,730	2,730
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.3	0.1	3,820	3,060	0.3	0.1	2,730	2,730
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.3	0.1	3,570	2,140	0.3	0.1	2,550	1,910
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.3	0.1	3,180	950	0.3	0.1	2,270	850
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.3	0.2	4,460	5,350	0.3	0.2	3,180	4,770
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.3	0.2	4,460	5,350	0.3	0.2	3,180	4,770
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.3	0.1	3,570	2,860	0.3	0.1	2,550	2,550
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.3	0.1	3,570	2,860	0.3	0.1	2,550	2,550
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.3	0.1	1,270	640	0.3	0.1	910	570
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.3	0.1	1,020	510	0.3	0.1	730	460

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min^{-1}) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min^{-1}) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Side wall finishing

Material	Grade	Tool dia.(mm)							
		42				52			
		6N				6N			
		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	0.3	0.1	2,270	2,720	0.3	0.1	1,840	2,210
Cast steel (GM190, ICD5) below 285HB	JC8015	0.3	0.1	2,270	2,720	0.3	0.1	1,840	2,210
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.3	0.1	2,270	2,720	0.3	0.1	1,840	2,210
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.3	0.1	2,270	2,720	0.3	0.1	1,840	2,210
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.3	0.1	2,120	1,910	0.3	0.1	1,710	1,540
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.3	0.1	1,890	850	0.3	0.1	1,530	690
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.3	0.2	2,650	4,770	0.3	0.2	2,140	3,850
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.3	0.2	2,650	4,770	0.3	0.2	2,140	3,850
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.3	0.1	2,120	2,540	0.3	0.1	1,710	2,050
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.3	0.1	2,120	2,540	0.3	0.1	1,710	2,050
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.3	0.1	760	570	0.3	0.1	610	460
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.3	0.1	610	460	0.3	0.1	490	370

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**■ **Recommended cutting conditions**■ **Side wall finishing**

Material	Grade	Tool dia.(mm)			
		66			
		7N			
		a_p (mm)	a_e (mm)	n (min ⁻¹)	V_f (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	0.3	0.1	1,450	2,030
Cast steel (GM190, ICD5) below 285HB	JC8015	0.3	0.1	1,450	2,030
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.3	0.1	1,450	2,030
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.3	0.1	1,450	2,030
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.3	0.1	1,350	1,420
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.3	0.1	1,210	640
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.3	0.2	1,690	3,550
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.3	0.2	1,690	3,550
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.3	0.1	1,350	1,890
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.3	0.1	1,350	1,890
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.3	0.1	480	420
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.3	0.1	390	340

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Bottom finishing

Material	Grade	Tool dia.(mm)							
		16				20			
		2N				3N			
		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	0.15	2.0(~9)	5170	2070	0.2	2.5(~13)	4140	2480
Cast steel (GM190, ICD5) below 285HB	JC8015	0.15	2.0(~9)	5170	2070	0.2	2.5(~13)	4140	2480
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.15	2.0(~9)	5170	2070	0.2	2.5(~13)	4140	2480
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.15	2.0(~9)	5170	2070	0.2	2.5(~13)	4140	2480
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.15	2.0(~9)	4770	1430	0.2	2.5(~13)	3820	1720
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.1	2.0(~9)	3780	570	0.15	2.5(~13)	3020	680
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.2	2.0(~9)	5970	2390	0.2	2.5(~13)	4770	2860
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.2	2.0(~9)	5970	2390	0.2	2.5(~13)	4770	2860
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.15	2.0(~9)	4770	1910	0.15	2.5(~13)	3820	2290
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.15	2.0(~9)	4770	1910	0.15	2.5(~13)	3820	2290
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.15	2.0(~9)	1090	220	0.2	2.5(~13)	880	260
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.15	2.0(~9)	1090	220	0.2	2.5(~13)	880	260

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Bottom finishing

Material	Grade	Tool dia.(mm)							
		25				35			
		4N				5N			
		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	0.2	4.0(~18)	3,310	2,650	0.2	4.3(~25)	2,360	2,360
Cast steel (GM190, ICD5) below 285HB	JC8015	0.2	4.0(~18)	3,310	2,650	0.2	4.3(~25)	2,360	2,360
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.2	4.0(~18)	3,310	2,650	0.2	4.3(~25)	2,360	2,360
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.2	4.0(~18)	3,310	2,650	0.2	4.3(~25)	2,360	2,360
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.2	4.0(~18)	3,060	1,840	0.2	4.3(~25)	2,180	1,640
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.15	4.0(~18)	2,420	730	0.15	4.3(~25)	1,730	650
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.2	4.0(~18)	3,820	3,060	0.2	4.3(~25)	2,730	2,730
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.2	4.0(~18)	3,820	3,060	0.2	4.3(~25)	2,730	2,730
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.15	4.0(~18)	3,060	2,450	0.15	4.3(~25)	2,180	2,180
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.15	4.0(~18)	3,060	2,450	0.15	4.3(~25)	2,180	2,180
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.2	4.0(~18)	700	280	0.2	4.3(~25)	500	250
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.2	4.0(~18)	700	280	0.2	4.3(~25)	500	250

Note

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2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Bottom finishing

Material	Grade	Tool dia.(mm)							
		42				52			
		6N				6N			
		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	0.2	5.0(~29)	1,970	2,360	0.2	6.2(~36)	1,590	1,910
Cast steel (GM190, ICD5) below 285HB	JC8015	0.2	5.0(~29)	1,970	2,360	0.2	6.2(~36)	1,590	1,910
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.2	5.0(~29)	1,970	2,360	0.2	6.2(~36)	1,590	1,910
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.2	5.0(~29)	1,970	2,360	0.2	6.2(~36)	1,590	1,910
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.2	5.0(~29)	1,820	1,640	0.2	6.2(~36)	1,470	1,320
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.15	5.0(~29)	1,440	650	0.15	6.2(~36)	1,160	520
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.2	5.0(~29)	2,270	2,720	0.2	6.2(~36)	1,840	2,210
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.2	5.0(~29)	2,270	2,720	0.2	6.2(~36)	1,840	2,210
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.15	5.0(~29)	1,820	2,180	0.15	6.2(~36)	1,470	1,760
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.15	5.0(~29)	1,820	2,180	0.15	6.2(~36)	1,470	1,760
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.2	5.0(~29)	420	250	0.2	6.2(~36)	340	200
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.2	5.0(~29)	420	250	0.2	6.2(~36)	340	200

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min^{-1}) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min^{-1}) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Bottom finishing

Material	Grade	Tool dia.(mm)			
		66			
		7N			
		a_p (mm)	a_e (mm)	n (min ⁻¹)	V_f (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	0.2	7.9(~46)	1,250	1,750
Cast steel (GM190, ICD5) below 285HB	JC8015	0.2	7.9(~46)	1,250	1,750
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	0.2	7.9(~46)	1,250	1,750
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	0.2	7.9(~46)	1,250	1,750
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	0.2	7.9(~46)	1,160	1,220
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	0.15	7.9(~46)	920	480
Grey cast iron (FC250) 160-260HB	DH103 JC8015	0.2	7.9(~46)	1,450	2,030
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	0.2	7.9(~46)	1,450	2,030
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	0.15	7.9(~46)	1,160	1,620
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	0.15	7.9(~46)	1,160	1,620
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.2	7.9(~46)	270	190
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.2	7.9(~46)	270	190

Note

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. The above cutting conditions are for a overhung length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate V_f (mm/min) according to the protrusion length
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate V_f (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Semi finishing

Material	Grade	Tool dia.(mm)									
		16					20				
		2N					3N				
		r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)	r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	35	0.2	7	3,780	4,540	40	0.2	9.8	3,020	5,440
		80	0.2	7	3,780	3,780	100	0.2	9.8	3,020	4,530
		120	0.2	7	3,780	3,020	150	0.2	9.8	3,020	3,620
		160	0.2	7	3,780	2,270	200	0.2	9.8	3,020	2,720
Cast steel (GM190, ICD5) below 285HB	JC8015	35	0.2	7	3,780	4,540	40	0.2	9.8	3,020	5,440
		80	0.2	7	3,780	3,780	100	0.2	9.8	3,020	4,530
		120	0.2	7	3,780	3,020	150	0.2	9.8	3,020	3,620
		160	0.2	7	3,780	2,270	200	0.2	9.8	3,020	2,720
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	35	0.2	7	3,480	4,180	40	0.2	9.8	2,790	5,020
		80	0.2	7	3,480	3,480	100	0.2	9.8	2,790	4,190
		120	0.2	7	3,480	2,780	150	0.2	9.8	2,790	3,350
		160	0.2	7	3,480	2,090	200	0.2	9.8	2,790	2,510
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	35	0.2	7	3,480	4,180	40	0.2	9.8	2,790	5,020
		80	0.2	7	3,480	3,480	100	0.2	9.8	2,790	4,190
		120	0.2	7	3,480	2,780	150	0.2	9.8	2,790	3,350
		160	0.2	7	3,480	2,090	200	0.2	9.8	2,790	2,510
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	35	0.2	7	3,180	3,820	40	0.2	9.8	2,550	4,590
		80	0.2	7	3,180	3,180	100	0.2	9.8	2,550	3,830
		120	0.2	7	3,180	2,540	150	0.2	9.8	2,550	3,060
		160	0.2	7	3,180	1,910	200	0.2	9.8	2,550	2,300
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	35	0.2	7	2,980	3,580	40	0.2	9.8	2,390	4,300
		80	0.2	7	2,980	2,980	100	0.2	9.8	2,390	3,590
		120	0.2	7	2,980	2,380	150	0.2	9.8	2,390	2,870
		160	0.2	7	2,980	1,790	200	0.2	9.8	2,390	2,150
Grey cast iron (FC250) 160-260HB	DH103 JC8015	35	0.2	7	3,180	3,820	40	0.2	9.8	2,550	4,590
		80	0.2	7	3,180	3,180	100	0.2	9.8	2,550	3,830
		120	0.2	7	3,180	2,540	150	0.2	9.8	2,550	3,060
		160	0.2	7	3,180	1,910	200	0.2	9.8	2,550	2,300
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	35	0.2	7	3,180	3,820	40	0.2	9.8	2,550	4,590
		80	0.2	7	3,180	3,180	100	0.2	9.8	2,550	3,830
		120	0.2	7	3,180	2,540	150	0.2	9.8	2,550	3,060
		160	0.2	7	3,180	1,910	200	0.2	9.8	2,550	2,300
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	35	0.2	7	3,380	4,060	40	0.2	9.8	2,710	4,880
		80	0.2	7	3,380	3,380	100	0.2	9.8	2,710	4,070
		120	0.2	7	3,380	2,700	150	0.2	9.8	2,710	3,250
		160	0.2	7	3,380	2,030	200	0.2	9.8	2,710	2,440
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	35	0.2	7	3,380	4,060	40	0.2	9.8	2,710	4,880
		80	0.2	7	3,380	3,380	100	0.2	9.8	2,710	4,070
		120	0.2	7	3,380	2,700	150	0.2	9.8	2,710	3,250
		160	0.2	7	3,380	2,030	200	0.2	9.8	2,710	2,440

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
3. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
4. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate Vf (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Semi finishing

Material	Grade	Tool dia.(mm)									
		25					35				
		4N					5N				
		r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)	r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	60	0.2	12	2,420	5,810	70	0.2	17	1,730	5,190
		125	0.2	12	2,420	4,840	175	0.2	17	1,730	4,330
		190	0.2	12	2,420	3,870	265	0.2	17	1,730	3,460
		250	0.2	12	2,420	2,900	350	0.2	17	1,730	2,600
Cast steel (GM190, ICD5) below 285HB	JC8015	60	0.2	12	2,420	5,810	40	0.2	17	1,730	5,190
		125	0.2	12	2,420	4,840	100	0.2	17	1,730	4,330
		190	0.2	12	2,420	3,870	150	0.2	17	1,730	3,460
		250	0.2	12	2,420	2,900	200	0.2	17	1,730	2,600
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	60	0.2	12	2,230	5,350	40	0.2	17	1,590	4,770
		125	0.2	12	2,230	4,460	100	0.2	17	1,590	3,980
		190	0.2	12	2,230	3,570	150	0.2	17	1,590	3,180
		250	0.2	12	2,230	2,680	200	0.2	17	1,590	2,390
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	60	0.2	12	2,230	5,350	40	0.2	17	1,590	4,770
		125	0.2	12	2,230	4,460	100	0.2	17	1,590	3,980
		190	0.2	12	2,230	3,570	150	0.2	17	1,590	3,180
		250	0.2	12	2,230	2,680	200	0.2	17	1,590	2,390
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	60	0.2	12	2,040	4,900	40	0.2	17	1,460	4,380
		125	0.2	12	2,040	4,080	100	0.2	17	1,460	3,650
		190	0.2	12	2,040	3,260	150	0.2	17	1,460	2,920
		250	0.2	12	2,040	2,450	200	0.2	17	1,460	2,190
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	60	0.2	12	1,910	4,580	40	0.2	17	1,360	4,080
		125	0.2	12	1,910	3,820	100	0.2	17	1,360	3,400
		190	0.2	12	1,910	3,060	150	0.2	17	1,360	2,720
		250	0.2	12	1,910	2,290	200	0.2	17	1,360	2,040
Grey cast iron (FC250) 160-260HB	DH103 JC8015	60	0.2	12	2,040	4,900	40	0.2	17	1,460	4,380
		125	0.2	12	2,040	4,080	100	0.2	17	1,460	3,650
		190	0.2	12	2,040	3,260	150	0.2	17	1,460	2,920
		250	0.2	12	2,040	2,450	200	0.2	17	1,460	2,190
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	60	0.2	12	2,040	4,900	40	0.2	17	1,460	4,380
		125	0.2	12	2,040	4,080	100	0.2	17	1,460	3,650
		190	0.2	12	2,040	3,260	150	0.2	17	1,460	2,920
		250	0.2	12	2,040	2,450	200	0.2	17	1,460	2,190
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	60	0.2	12	2,160	5,180	40	0.2	17	1,550	4,650
		125	0.2	12	2,160	4,320	100	0.2	17	1,550	3,880
		190	0.2	12	2,160	3,460	150	0.2	17	1,550	3,100
		250	0.2	12	2,160	2,590	200	0.2	17	1,550	2,330
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	60	0.2	12	2,160	5,180	40	0.2	17	1,550	4,650
		125	0.2	12	2,160	4,320	100	0.2	17	1,550	3,880
		190	0.2	12	2,160	3,460	150	0.2	17	1,550	3,100
		250	0.2	12	2,160	2,590	200	0.2	17	1,550	2,330

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
3. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
4. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate Vf (mm/min) to 80% of the above conditions.

DIEMASTER 5G

MXF/XFG Type

■ Recommended cutting conditions

■ Semi finishing

Material	Grade	Tool dia.(mm)									
		42					52				
		6N					6N				
		r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)	r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	100	0.2	20	1,440	5,180	150	0.2	26	1,160	4,180
		210	0.2	20	1,440	4,320	250	0.2	26	1,160	3,480
		315	0.2	20	1,440	3,460	350	0.2	26	1,160	2,780
		420	0.2	20	1,440	2,590	—	—	—	—	—
Cast steel (GM190, ICD5) below 285HB	JC8015	100	0.2	20	1,440	5,180	150	0.2	26	1,160	4,180
		210	0.2	20	1,440	4,320	250	0.2	26	1,160	3,480
		315	0.2	20	1,440	3,460	350	0.2	26	1,160	2,780
		420	0.2	20	1,440	2,590	—	—	—	—	—
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	100	0.2	20	1,330	4,790	150	0.2	26	1,070	3,850
		210	0.2	20	1,330	3,990	250	0.2	26	1,070	3,210
		315	0.2	20	1,330	3,190	350	0.2	26	1,070	2,570
		420	0.2	20	1,330	2,390	—	—	—	—	—
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	100	0.2	20	1,330	4,790	150	0.2	26	1,070	3,850
		210	0.2	20	1,330	3,990	250	0.2	26	1,070	3,210
		315	0.2	20	1,330	3,190	350	0.2	26	1,070	2,570
		420	0.2	20	1,330	2,390	—	—	—	—	—
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	100	0.2	20	1,210	4,360	150	0.2	26	980	3,530
		210	0.2	20	1,210	3,630	250	0.2	26	980	2,940
		315	0.2	20	1,210	2,900	350	0.2	26	980	2,350
		420	0.2	20	1,210	2,180	—	—	—	—	—
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	100	0.2	20	1,140	4,100	150	0.2	26	920	3,310
		210	0.2	20	1,140	3,420	250	0.2	26	920	2,760
		315	0.2	20	1,140	2,740	350	0.2	26	920	2,210
		420	0.2	20	1,140	2,050	—	—	—	—	—
Grey cast iron (FC250) 160-260HB	DH103 JC8015	100	0.2	20	1,210	4,360	150	0.2	26	980	3,530
		210	0.2	20	1,210	3,630	250	0.2	26	980	2,940
		315	0.2	20	1,210	2,900	350	0.2	26	980	2,350
		420	0.2	20	1,210	2,180	—	—	—	—	—
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	100	0.2	20	1,210	4,360	150	0.2	26	980	3,530
		210	0.2	20	1,210	3,630	250	0.2	26	980	2,940
		315	0.2	20	1,210	2,900	350	0.2	26	980	2,350
		420	0.2	20	1,210	2,180	—	—	—	—	—
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	100	0.2	20	1,290	4,640	150	0.2	26	1,040	3,740
		210	0.2	20	1,290	3,870	250	0.2	26	1,040	3,120
		315	0.2	20	1,290	3,100	350	0.2	26	1,040	2,500
		420	0.2	20	1,290	2,320	—	—	—	—	—
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	100	0.2	20	1,290	4,640	150	0.2	26	1,040	3,740
		210	0.2	20	1,290	3,870	250	0.2	26	1,040	3,120
		315	0.2	20	1,290	3,100	350	0.2	26	1,040	2,500
		420	0.2	20	1,290	2,320	—	—	—	—	—

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
3. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
4. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate Vf (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Semi finishing

Material	Grade	Tool dia.(mm)				
		66				
		7N				
		r (mm)	ap (mm)	ae (mm)	n (min ⁻¹)	Vf (mm/min)
Carbon steel (S50C, S55C) below 250HB	JC8015	200	0.2	33	920	3,860
		350	0.2	33	920	3,220
		450	0.2	33	920	2,580
		—	—	—	—	—
Cast steel (GM190, ICD5) below 285HB	JC8015	200	0.2	33	920	3,860
		350	0.2	33	920	3,220
		450	0.2	33	920	2,580
		—	—	—	—	—
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	200	0.2	33	840	3,530
		350	0.2	33	840	2,940
		450	0.2	33	840	2,350
		—	—	—	—	—
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	200	0.2	33	840	3,530
		350	0.2	33	840	2,940
		450	0.2	33	840	2,350
		—	—	—	—	—
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	200	0.2	33	770	3,230
		350	0.2	33	770	2,700
		450	0.2	33	770	2,160
		—	—	—	—	—
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	200	0.2	33	720	3,020
		350	0.2	33	720	2,520
		450	0.2	33	720	2,020
		—	—	—	—	—
Grey cast iron (FC250) 160-260HB	DH103 JC8015	200	0.2	33	770	3,230
		350	0.2	33	770	2,700
		450	0.2	33	770	2,160
		—	—	—	—	—
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	200	0.2	33	770	3,230
		350	0.2	33	770	2,700
		450	0.2	33	770	2,160
		—	—	—	—	—
Austenitic stainless steel (SUS304, 316, 317) 17Cr	JC8015	200	0.2	33	820	3,440
		350	0.2	33	820	2,870
		450	0.2	33	820	2,300
		—	—	—	—	—
Ferritic & martensitic stainless steel (SUS403, 420J2, 430) 13Cr	JC8015	200	0.2	33	820	3,440
		350	0.2	33	820	2,870
		450	0.2	33	820	2,300
		—	—	—	—	—

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
3. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
4. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate Vf (mm/min) to 80% of the above conditions.

DIEMASTER 5G**MXF/XFG Type**

■ Recommended cutting conditions

■ Plunge finishing

Material	Grade	V _c (mm/min)	f _z (mm/t)	a _e (mm)	P _f (mm)
Carbon steel (S50C, S55C) below 250HB	JC8015	400	0.1	- 0.2	Calculate from theoretical surface finish roughness
Cast steel (GM190, ICD5) below 285HB	JC8015	400	0.1	- 0.2	
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	350	0.1	- 0.2	
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	300	0.1	- 0.2	
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	200	0.1	- 0.2	
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	140	0.07	- 0.2	
Grey cast iron (FC250) 160-260HB	DH103 JC8015	500	0.1	- 0.2	
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	500	0.1	- 0.2	

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. The above cutting conditions are for a protrusion length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate Vf (mm/min) according to the protrusion length.
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate Vf (mm/min) to 80% of the above conditions.
6. For up and down milling, use a_e = 0.1 mm or less. .

DIEMASTER 5G**MXF/XFG Type**■ **Recommended cutting conditions**■ **Plunge semi finishing**

Material	Grade	V _c (mm/min)	f _z (mm/t)	a _e (mm)	P _f (mm)
Carbon steel (S50C, S55C) below 250HB	JC8015	300	0.15	~2	~0.15Dc
Cast steel (GM190, ICD5) below 285HB	JC8015	300	0.15	~2	~0.15Dc
Tool & die steel (SKD61, SKD11) below 255HB	JC8015	260	0.15	~2	~0.15Dc
Mold steel (HPM7, PX5, P20) 30-36 HRC	DH103 JC8015	220	0.12	~2	~0.15Dc
Mold steel (NAK80, HPM1, P21) 38-43HRC	DH103 JC8015	150	0.12	~2	~0.15Dc
Hardened die steel (SKD61, DAC, DHA) 42-52HRC	DH103 JC8015	100	0.1	~2	~0.15Dc
Grey cast iron (FC250) 160-260HB	DH103 JC8015	370	0.15	~2	~0.15Dc
Nodular cast iron (FCD700) 170-300HB	DH103 JC8015	370	0.15	~2	~0.15Dc

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. The above cutting conditions are for a protrusion length of 3Dc.
Adjust the rotation speed n (min⁻¹) and feed rate Vf (mm/min) according to the protrusion length.
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min⁻¹) and feed rate Vf (mm/min) to 80% of the above conditions.
6. For up and down milling, use a_e = 0.1 mm or less. .