

## Features of HEPTA MILL

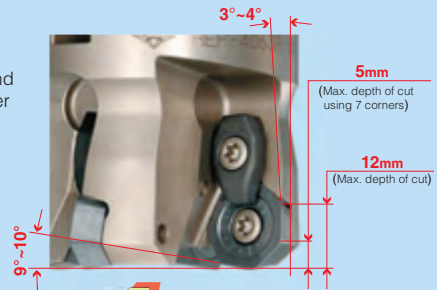


# 1

### High metal removal

Cutting forces are reduced due to outer edge and inner edge has side and face clearance, so high feed machining can be achieved in case of higher depth of cut.

- Material to be cut S50C (C50): fz=1mm/t in case of ap=3mm, fz=0.6mm/t in case of ap=5mm.
- Material to be cut FC300 (GG300): fz=1mm/t in case of ap=5mm.
- Material to be cut SKD61 (1.2344), 45HRC: fz=0.6mm/t in case of ap=2.5mm.



# 2

### G-Body

Combination of rigid G-Body and high stability to the insert in the insert pocket gives stable machining without chatter in case of roughing.

# 3

### Stronger heptagon insert

Improved insert strength 40% compared with conventional insert by increasing size and thickness of insert.

# 4

### 7 times indexability

Heptagoninsert gives maximum 7 times indexability when ap=5mm or less.

# 5

### Double clamp system

Adopted double clamp system tightens the insert strongly.

Please refer page C009 for "Insert set up installation point of double clamping mechanism type"

# 6

### Insert grades JC5040 JC8015 JC8050 JC7560

"JC5040" is suitable for general steel.  
"JC8015" is suitable for cast iron, stainless steel and hardened steel.  
Tough grade "JC8050" against chipping for unfavorable conditions.  
"JC7560" improved heat-fracture and impact strength for rough milling.

# 7

### Insert corner identification

Insert has corner identification No. on the top face.



**NEW**

## HEPTA MILL

**HEP** type HEPTA MILL with Heptagon insert

# Hepta Mill

# HEP<sub>TYPE</sub>

## CUTTING PERFORMANCE

### Chip volume comparison

HEPTA MILL: HEP-4063R-08

#### Cutting condition

Mat'l: S50C (C50), 201HB  
 Tool dia.:  $\varnothing$  63mm  
 n=800min<sup>-1</sup>  
 $a_p=3\text{mm}$   
 $a_e=40\text{mm}$   
 $Q=384\text{cm}^3/\text{min}$   
 Power load: 66%

High feed cutter

#### Cutting condition

Mat'l: S50C (C50), 201HB  
 Tool dia.:  $\varnothing$  63mm  
 n=800min<sup>-1</sup>  
 $a_p=1.5\text{mm}$   
 $a_e=40\text{mm}$   
 $Q=384\text{cm}^3/\text{min}$   
 Power load: 66%



Chip volume comparison  
 (same weight 3kg/min)

← LESS STORAGE SPACE REQUIRED

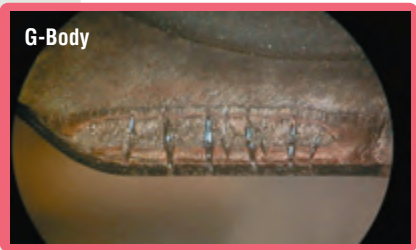
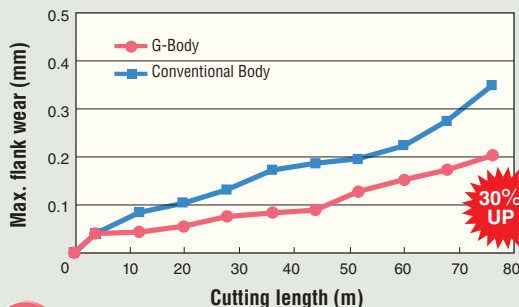


Reduced chip volume by 20%

### Tool life comparison G-body VS Conventional body

#### Cutting condition

Mat'l: S53C  
 Tool dia.:  $\varnothing$  63mm  
 (HEP-4063R-08)  
 n=800min<sup>-1</sup>  
 $V_c=158\text{m}/\text{min}$   
 $V_f=800\text{mm}/\text{min}$   
 $f_z=1\text{mm}/\text{t}$   
 $a_p=3\text{mm}$   
 $a_e=40\text{mm}$   
 Dry, Down cut  
 Insert grade: JC5040



G-body gives body strength and improved tool life by 1.3 times compared with conventional body.

# Hepta Mill

# HEP<sub>TYPE</sub>



**Through Coolant Hole** (except dia.  $\phi 200$ )



Fig. 1

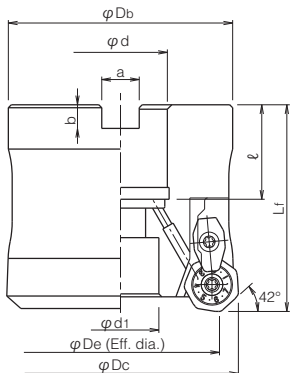


Fig. 2 (Without coolant hole)

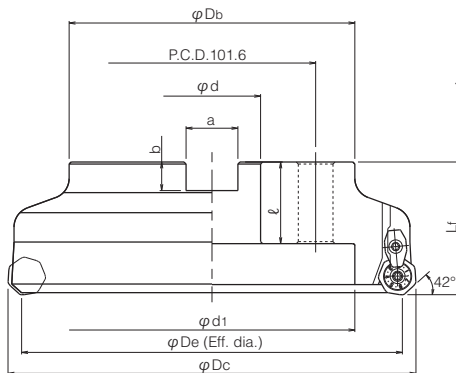
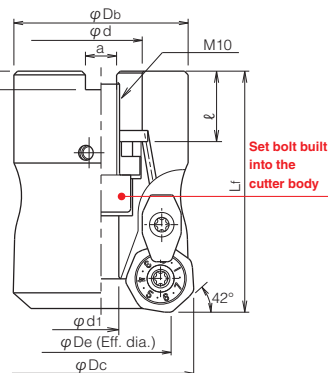


Fig. 3



## ■ BODY/FACE MILL TYPE




Type	Cat. No.	Stock	No. of flutes	Dimensions (mm)									Head cap screw (JIS Standard)	weight (kg)	Fig.
				$\phi Dc$	$\phi De$ (Eff. dia.)	Lf	$\phi Db$	$\phi d$	$\phi d1$	a	b	$\ell$			
Metric Bore	HEP-3050R-08-22	●	3	50	36.7	65	47	22	9.6	10.4	6.3	19	※M10×1.5×25	0.9	3
	HEP-4063R-08-22	●	4	63	49.5	50	60	22	17	10.4	6.3	20	M10	1.1	1
	HEP-4063R-08-27	●	4	63	49.5	50	60	27	20	12.4	7	22	※M12×1.75×30	1.1	1
	HEP-5080R-08-27	●	5	80	66.6	55	76	27	20	12.4	7	22	※M12×1.75×40	1.9	1
	HEP-6100R-08-32	●	6	100	86.6	70	96	32	26	14.4	8	32	※M16×2.0×45	3.6	1
	HEP-7125R-08-40	●	7	125	111.6	70	100	40	32	16.4	9	35	※M20×2.5×45	5.5	1
	HEP-8160R-08-40	●	8	160	146.6	70	100	40	32	16.4	9	35	※M20×2.5×45	8.4	1
	HEP-9200R-08-60	●	9	200	186.6	65	140	60	140	25.4	14.3	40	M16	10.2	2

- Note) 1. All cutters are supplied without inserts.  
 2. Please refer page C112-C119 for recommended cutting conditions.  
 3. ※ Mark shows: these cutter bodies are equipped with the set bolt because of the specified bolt size. Except for these cutter bodies, please use the set bolt equipped with arbor.  
 4. In case of using double clamping mechanism type, please refer page C009.


## Hepta Mill

HEP<sub>TYPE</sub>

## ■ PARTS

Clamp screw	Clamp set	Wrench
 Recommended Torque 6.0 N•m		
DSW-4512H	DCM-17	Facemill type : A-20 Endmill type : A-20SD

## ■ HEXAGON WRENCH SIZE FOR SET BOLT

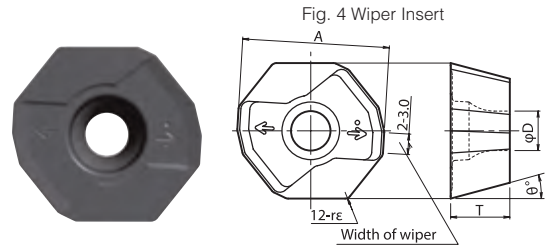
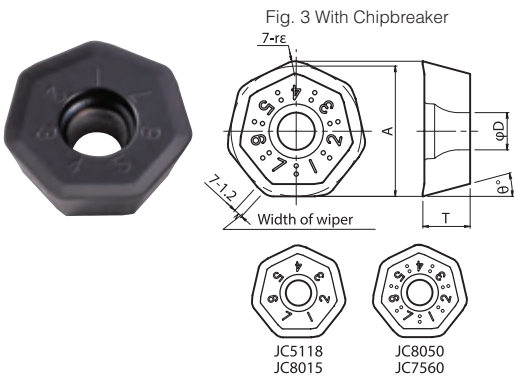
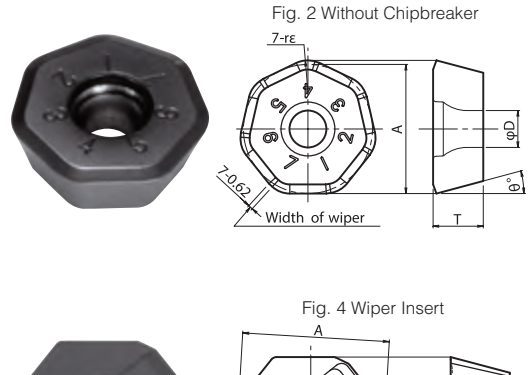
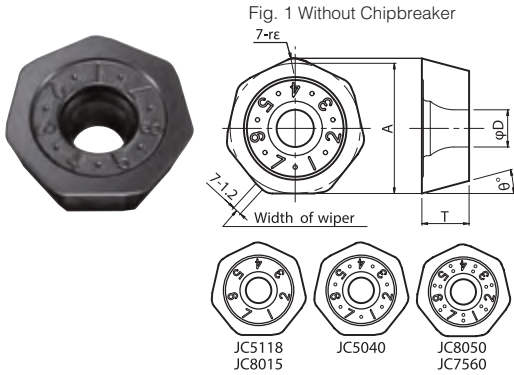
Thread	 Hexagon wrench size (mm)
M10	8
M12	10
M16	14
M20	17
M24	19

Note) All cutters are supplied without hexagon wrench.

# Hepta Mill

# HEP<sub>TYPE</sub>

## ■ INSERTS



Cat. No.	Tolerance	Dimensions (mm)					PVD coated						Fig.
		A	T	φD	rε	θ°	JCS8015	JCS5040	JCS118	JCS8118	JCS8050	JCS7560	
XDMW080620ZTR	M	17.5	6.35	5	2	15	●	○	○		●	●	1
XDMW080635ZTR-S	M	17.5	6.35	5	3.5	15	●						2
XDMT080620ZER	M	17.5	6.35	5	2	15	●		○		●	●	3
XDMT080708ZER (Wiper Insert)	M	18.6	7.5	5	0.8	15	●						4
XDMT080620ZER-ML	M	17.3	6.5	5	2	15				●		●	3

10 inserts per case

## ■ How to use of corner change



Recommend to rotate the insert counter-clockwise for corner change.

# Hepta Mill

# HEP<sub>TYPE</sub>

## Attention for using wiper insert

- In case of feed per rev.  $f > 1.2\text{mm/rev}$  and required surface roughness  $Rz \approx 12.5 \mu\text{m}$ , we recommend to use wiper insert.

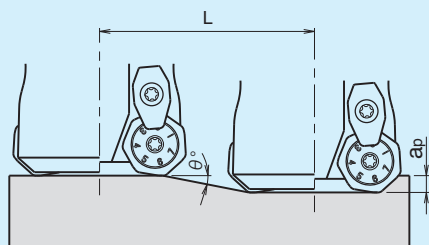
f (mm/rev)	No. of wiper inserts to install
$1.2 < f \text{ (mm/rev)} \leq 3$	1
$3 < f \text{ (mm/rev)} \leq 6$	2
$6 < f \text{ (mm/rev)} \leq 9$	3
$9 < f \text{ (mm/rev)} \leq 12$	4

- Please put wiper inserts to become unequal pitch.
- Even if wiper insert is used, the same cutting condition (page C088-C095) is applied.

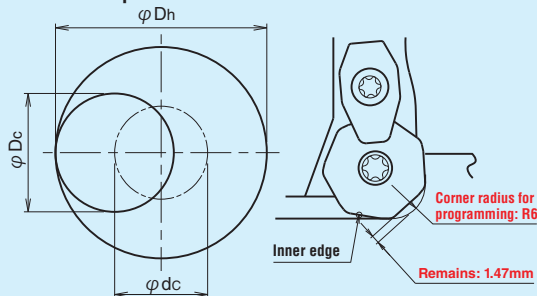


## Instructions for profiling milling with "HEPTA MILL"

### 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 ap.

### Down cutting is recommended, so tool pass rotation should be counter-clockwise.

Cat. No.	Tool dia. $\varphi_{Dc}$ (mm)	Effective cutting dia. (mm)	Ramping (at maximum depth of cut $a_p=5\text{mm}$ )				Helical interpolation	
			Ramping angle to the inner edge $\theta^\circ$	Total cutting length with inner edge L (mm)	Max. ramping angle $\theta^\circ$	Total cutting length L (mm)	Min. bore dia. $D_h \text{ min}$ (mm)	Max. bore dia. $D_h \text{ max}$ (mm)
HEP-3050	50	36.7	$1^\circ 50'$	156	$9^\circ$	31	74	96
HEP-*063	63	49.5	$1^\circ 25'$	202	$7^\circ$	40	100	122
HEP-*080	80	66.6	$1^\circ$	286	$5^\circ$	57	134	156
HEP-*100	100	86.6	$0^\circ 45'$	382	$3^\circ 30'$	81	174	196
HEP-*125	125	111.6	$0^\circ 35'$	491	$2^\circ 30'$	114	224	246
HEP-*160	160	146.6	$0^\circ 25'$	687	$2^\circ$	143	294	316
HEP-*200	200	186.6	$0^\circ 20'$	860	$1^\circ 30'$	190	374	396

## Hepta Mill

HEP<sub>TYPE</sub>

## RECOMMENDED CUTTING CONDITIONS

## General Use

Work Materials	Inserts	Insert Grades	Overhung length $\ell$ (mm)	Tool dia. (mm)							
				50				63			
				No. of teeth 3N				No. of teeth 4N			
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)	$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	4	900	2,200	15.7	4	700	2,300	20.6
			150	3.5	800	1,700	10.6	3.5	650	1,800	14.1
			200	3	700	1,300	7	3	600	1,500	10.1
			250	2.5	700	1,050	4.7	2.5	600	1,200	6.7
			300	2	700	1,050	3.7	2	600	1,200	5.4
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMT080620ZER(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC5118) (JC5040)	100	3	900	1,900	10.2	3	700	2,000	13.6
			150	2.5	800	1,400	6.3	2.5	650	1,600	9.1
			200	2.5	700	1,050	4.7	2.5	600	1,200	6.8
			250	2	700	850	3.1	2	600	1,000	4.5
			300	2	700	850	3.1	2	600	1,000	4.5
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER (XDMT080620ZER)	JC5118 (JC8015)	100	3	650	1,400	8.1	3	500	1,400	10.2
			150	2.5	600	1,100	5.3	2.5	450	1,100	6.7
			200	2.5	500	750	3.6	2.5	400	700	4.2
			250	2	500	600	2.3	2	400	600	2.9
			300	2	500	600	2.3	2	400	600	2.9
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	3	900	1,900	10.2	3	700	2,000	13.6
			150	2.5	800	1,400	6.3	2.5	650	1,600	9.1
			200	2.5	700	1,050	4.7	2.5	600	1,200	6.8
			250	2	700	850	3.1	2	600	1,000	4.5
			300	2	700	850	3.1	2	600	1,000	4.5
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	450	550	3.8	2.5	450	700	6.1
			150	2	400	450	2.5	2	400	600	4.2
			200	2	350	320	1.8	2	300	350	2.5
			250	1.5	350	320	1.3	1.5	300	350	1.8
			Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMW080635ZTR-S)	JC8015 (JC8015)	100	5	900	2,700	17.2	5
150	4	800				2,400	12.2	4	600	2,400	15.4
200	3.5	700				1,800	8	3.5	550	2,000	11.2
250	3	700				1,600	6.1	3	550	1,600	7.7
300	2.5	700				1,600	5.1	2.5	550	1,600	6.4
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMW080620ZTR) (XDMW080635ZTR-S)	JC5118 (JC8015) (JC8015)	100	4	750	1,800	13.5	4	600	2,000	18.9
			150	3	680	1,350	7.6	3	550	1,450	10.3
			200	2.5	600	1,000	4.7	2.5	500	1,150	6.8
			250	2	600	900	3.4	2	500	900	4.3
			300	1.5	600	900	2.5	1.5	500	900	3.2
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	800	1,200	9.2	4	650	1,200	11.6
			150	3.5	700	1,000	6.7	3.5	600	1,000	8.5
			200	3	600	700	4	3	500	800	5.8
			250	2.5	600	550	2.6	2.5	500	600	3.6
			300	2	600	550	2.1	2	500	600	2.9

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.

## Hepta Mill

HEP<sub>TYPE</sub>

## RECOMMENDED CUTTING CONDITIONS

## General Use

Work Materials	Inserts	Insert Grades	Overhung length $l$ (mm)	Tool dia. (mm)							
				80				100			
				No. of teeth 5N				No. of teeth 6N			
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)	$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	4	550	2,200	25.1	4	450	2,200	31.3
			150	4	500	1,800	20.5	4	400	1,700	24.2
			200	3.5	450	1,400	14	3.5	350	1,300	16.2
			250	3	450	1,100	9.4	3	350	1,100	11.8
			300	2.5	450	1,100	7.8	2.5	350	1,100	9.8
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMT080620ZER(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC5118) (JC5040)	100	3	550	2,000	17.3	3	450	1,900	20.5
			150	3	500	1,500	12.9	3	400	1,500	16.2
			200	2.5	450	1,100	7.9	2.5	350	1,100	9.9
			250	2.5	450	900	6.5	2.5	350	850	7.6
			300	2	450	900	5.2	2	350	850	6.1
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER (XDMT080620ZER)	JC5118 (JC8015)	100	3	400	1,300	12	3	350	1,500	17.3
			150	3	350	1,050	9.7	3	300	1,200	13.8
			200	2.5	300	800	6.2	2.5	250	800	7.7
			250	2.5	300	600	4.6	2.5	250	600	5.8
			300	2	300	600	3.7	2	250	600	4.6
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	3	550	2,000	17.3	3	450	1,900	20.5
			150	3	500	1,500	12.9	3	400	1,500	16.2
			200	2.5	450	1,100	7.9	2.5	350	1,100	9.9
			250	2.5	450	900	6.5	2.5	350	850	7.6
			300	2	450	900	5.2	2	350	850	6.1
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	350	700	7.8	2.5	250	600	8.3
			150	2.5	300	600	6.7	2.5	200	500	6.9
			200	2	250	400	3.6	2	160	400	4.4
			250	2	250	350	3.1	2	160	350	3.9
Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMW080635ZTR-S)	JC8015 (JC8015)	100	5	550	2,750	28	5	450	2,700	34.4
			150	5	500	2,400	24.5	5	400	2,400	30.6
			200	4	450	1,800	14.7	4	350	2,000	20.4
			250	3.5	450	1,600	11.4	3.5	350	1,600	14.3
			300	3	450	1,600	9.8	3	350	1,600	12.2
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMW080620ZTR) (XDMW080635ZTR-S)	JC5118 (JC8015) (JC8015)	100	4	450	1,750	21	4	380	1,800	27.1
			150	4	400	1,350	16.2	4	350	1,350	20.3
			200	3	380	1,000	9	3	300	1,150	13
			250	2.5	380	900	6.8	2.5	300	900	8.5
			300	2	380	900	5.4	2	300	900	6.8
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	500	1,200	14.7	4	400	1,100	16.9
			150	4	450	900	11.1	4	350	1,000	15.4
			200	3.5	400	800	8.6	3.5	300	700	9.4
			250	3	400	600	5.5	3	300	600	6.9
			300	2.5	400	600	4.6	2.5	300	550	5.3

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.



## Hepta Mill

HEP<sub>TYPE</sub>

## RECOMMENDED CUTTING CONDITIONS

## General Use

Work Materials	Inserts	Insert Grades	Overhung length $l$ (mm)	Tool dia. (mm)							
				125				160			
				No. of teeth 7N				No. of teeth 8N			
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)	$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	4	350	2,000	35.6	4	300	1,900	43.3
			150	4	320	1,600	28.5	4	260	1,500	34.2
			200	4	300	1,300	23.1	4	220	1,100	25.1
			250	3.5	300	1,100	17.1	3.5	220	900	18
			300	3	300	1,100	14.7	3	220	900	15.4
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMT080620ZER(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC5118) (JC5040)	100	3	350	1,700	22.9	3	300	1,700	29.3
			150	3	320	1,350	18.2	3	260	1,250	21.6
			200	3	300	1,050	14.2	3	220	900	15.5
			250	2.5	300	1,000	11.2	2.5	220	700	10.1
			300	2.5	300	1,000	11.2	2.5	220	700	10.1
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER (XDMT080620ZER)	JC5118 (JC8015)	100	3	300	1,500	21.6	3	250	1,400	25.8
			150	3	250	1,100	15.8	3	200	1,000	18.4
			200	3	200	750	10.8	3	150	600	11.1
			250	2.5	200	600	7.2	2.5	150	500	7.7
			300	2.5	200	600	7.2	2.5	150	500	7.7
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	3	350	1,700	22.9	3	300	1,700	29.3
			150	3	320	1,350	18.2	3	260	1,250	21.6
			200	3	300	1,050	14.2	3	220	900	15.5
			250	2.5	300	1,000	11.2	2.5	220	700	10.1
			300	2.5	300	1,000	11.2	2.5	220	700	10.1
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	200	550	9.5	2.5	170	550	12.2
			150	2.5	150	400	6.9	2.5	150	500	11.1
			200	2.5	125	260	4.5	2.5	120	300	6.7
			250	2	125	260	3.6	2	120	280	5
			300	2	125	260	3.6	2	120	280	5
Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMW080635ZTR-S)	JC8015 (JC8015)	100	5	350	2,450	39	5	280	2,250	45.9
			150	5	320	2,200	35	5	260	2,100	42.8
			200	5	280	1,800	28.7	5	220	1,700	34.7
			250	4	280	1,400	17.8	4	220	1,400	22.8
			300	3.5	280	1,400	15.6	3.5	220	1,400	20
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMW080620ZTR) (XDMW080635ZTR-S)	JC5118 (JC8015) (JC8015)	100	4	300	1,700	31.9	4	250	1,500	36.1
			150	4	270	1,250	23.5	4	220	1,200	28.9
			200	3	250	1,000	14.1	3	180	950	17.1
			250	3	250	800	11.3	3	180	800	14.4
			300	2.5	250	800	9.4	2.5	180	800	12
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	300	1,000	19.2	4	240	900	22.1
			150	4	250	800	15.4	4	200	750	18.4
			200	4	220	650	12.5	4	180	600	14.7
			250	3.5	220	550	9.2	3.5	180	500	10.8
			300	3	220	500	7.2	3	180	450	8.3

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.

## RECOMMENDED CUTTING CONDITIONS

## General Use

Work Materials	Inserts	Insert Grades	Overhung length $l$ (mm)	Tool dia. (mm)						
				200						
				No. of teeth 9N						
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)			
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	4	220	1,600	45.6			
			150	4	200	1,300	37			
			200	4	180	1,000	28.5			
			250	3.5	180	800	20			
			300	3	180	800	17.1			
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMT080620ZER(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC5118) (JC5040)	100	3	220	1,400	30.2			
			150	3	200	1,100	23.7			
			200	3	180	800	17.3			
			250	2.5	180	650	11.7			
			300	2.5	180	650	11.7			
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER (XDMT080620ZER)	JC5118 (JC8015)	100	3	200	1,100	25.3			
			150	3	170	1,000	23			
			200	3	130	600	13.8			
			250	2.5	130	500	9.6			
			300	2.5	130	500	9.6			
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMT080620ZER(-ML) (XDMW080620ZTR)	JC7560 (JC5040)	100	3	220	1,400	30.2			
			150	3	200	1,100	23.7			
			200	3	180	800	17.3			
			250	2.5	180	650	11.7			
			300	2.5	180	650	11.7			
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	140	500	13.9			
			150	2.5	120	450	12.5			
			200	2.5	100	280	7.8			
			250	2	100	250	5.6			
Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMW080635ZTR-S)	JC8015 (JC8015)	100	5	220	2,000	51			
			150	5	200	1,800	45.9			
			200	5	180	1,400	35.7			
			250	4	180	1,300	26.5			
			300	3.5	180	1,300	23.2			
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMW080620ZTR) (XDMW080635ZTR-S)	JC5118 (JC8015) (JC8015)	100	4	180	1,350	40.6			
			150	4	170	1,000	30.1			
			200	3	150	800	18			
			250	3	150	700	15.8			
			300	2.5	150	700	13.2			
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	200	800	24.6			
			150	4	160	650	20			
			200	4	140	550	16.9			
			250	3.5	140	450	12.1			
			300	3	140	400	9.2			

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.

## Hepta Mill

HEP<sub>TYPE</sub>

## RECOMMENDED CUTTING CONDITIONS

## Interrupted Cutting

Work Materials	Inserts	Insert Grades	Overhung length $l$ (mm)	Tool dia. (mm)							
				50				63			
				No. of teeth 3N				No. of teeth 4N			
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)	$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	4	750	1,800	12.8	4	600	1,950	17.5
			150	3.5	680	1,450	9	3.5	550	1,500	11.8
			200	3	600	1,100	5.9	3	500	1,300	8.8
			250	2.5	600	900	4	2.5	500	1,000	5.6
			300	2	600	900	3.2	2	500	1,000	4.5
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	750	1,600	8.6	3	600	1,700	11.6
			150	2.5	680	1,200	5.4	2.5	550	1,350	7.6
			200	2.5	600	900	4.1	2.5	500	1,000	5.7
			250	2	600	720	2.6	2	500	850	3.9
			300	2	600	720	2.6	2	500	850	3.9
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER	JC5118	100	3	550	1,100	6.3	3	450	1,250	9.1
			150	2.5	500	900	4.3	2.5	400	1,000	6.1
			200	2.5	400	600	2.9	2.5	350	700	4.2
			250	2	400	500	1.9	2	350	600	2.9
			300	2	400	500	1.9	2	350	600	2.9
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	750	1,600	8.6	3	600	1,700	11.6
			150	2.5	680	1,200	5.4	2.5	550	1,350	7.6
			200	2.5	600	900	4.1	2.5	500	1,000	5.7
			250	2	600	720	2.6	2	500	850	3.9
			300	2	600	720	2.6	2	500	850	3.9
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	450	450	3.1	2.5	450	550	4.8
			150	2	400	350	1.9	2	400	500	3.5
			200	2	350	250	1.4	2	300	300	2.1
			250	1.5	350	250	1	1.5	300	300	1.6
			Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	5	750	2,250	14.3	5
150	4	680				2,000	10.2	4	550	2,200	14.2
200	3.5	600				1,500	6.8	3.5	500	1,700	9.5
250	3	600				1,350	5.2	3	500	1,350	6.5
300	2.5	600				1,350	4.3	2.5	500	1,350	5.4
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	4	650	1,400	10.5	4	550	1,500	14.2
			150	3	600	1,100	6.2	3	500	1,200	8.5
			200	2.5	500	750	3.5	2.5	400	800	4.8
			250	2	500	600	2.3	2	400	650	3.1
			300	1.5	500	600	1.7	1.5	400	650	2.3
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	650	1,000	7.7	4	500	1,000	9.7
			150	3.5	550	800	5.4	3.5	450	800	6.8
			200	3	500	550	3.2	3	400	650	4.7
			250	2.5	500	450	2.2	2.5	400	500	3
			300	2	500	450	1.7	2	400	500	2.4

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.

## Hepta Mill

HEP<sub>TYPE</sub>

## RECOMMENDED CUTTING CONDITIONS

## Interrupted Cutting

Work Materials	Inserts	Insert Grades	Overhung length $\ell$ (mm)	Tool dia. (mm)							
				80				100			
				No. of teeth 5N				No. of teeth 6N			
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)	$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	4	450	1,800	20.5	4	380	1,800	25.6
			150	4	400	1,500	17.1	4	350	1,400	19.9
			200	3.5	380	1,200	12	3.5	300	1,100	13.7
			250	3	380	900	7.7	3	300	900	9.6
			300	2.5	380	900	6.4	2.5	300	900	8
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	450	1,700	14.7	3	380	1,600	17.3
			150	3	400	1,250	10.8	3	350	1,250	13.5
			200	2.5	380	900	6.5	2.5	300	900	8.9
			250	2.5	380	750	5.4	2.5	300	700	6.3
			300	2	380	750	4.3	2	300	700	5
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER	JC5118	100	3	350	1,150	10.6	3	300	1,200	13.8
			150	3	300	900	8.3	3	250	900	10.4
			200	2.5	250	700	5.4	2.5	200	550	5.3
			250	2.5	250	500	3.8	2.5	200	450	4.3
			300	2	250	500	3.1	2	200	450	3.5
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	450	1,700	14.7	3	380	1,600	17.3
			150	3	400	1,250	10.8	3	350	1,250	13.5
			200	2.5	380	900	6.5	2.5	300	900	8.9
			250	2.5	380	750	5.4	2.5	300	700	6.3
			300	2	380	750	4.3	2	300	700	5
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	350	550	6.1	2.5	250	500	6.9
			150	2.5	300	500	5.6	2.5	200	400	5.6
			200	2	250	320	2.8	2	160	320	3.6
			250	2	250	280	2.5	2	160	280	3.1
			Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	5	450	2,250	22.9	5
150	5	400				1,900	19.3	5	350	2,000	26
200	4	380				1,500	12.2	4	300	1,700	17.3
250	3.5	380				1,350	9.7	3.5	300	1,400	12.2
300	3	380				1,350	8.3	3	300	1,350	10.4
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	4	400	1,350	16.2	4	330	1,200	18
			150	4	350	1,100	13.2	4	300	900	13.5
			200	3	300	800	7.2	3	250	750	8.5
			250	2.5	300	650	4.9	2.5	250	600	5.6
			300	2	300	650	3.9	2	250	600	4.5
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	400	1,000	12.3	4	300	900	13.8
			150	4	350	700	8.6	4	300	800	12.3
			200	3.5	300	650	7	3.5	250	600	8.1
			250	3	300	600	5.5	3	250	500	5.8
			300	2.5	300	600	4.6	2.5	250	450	4.3

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.

## Hepta Mill

HEP<sub>TYPE</sub>

## RECOMMENDED CUTTING CONDITIONS

## Interrupted Cutting

Work Materials	Inserts	Insert Grades	Overhung length $l$ (mm)	Tool dia. (mm)							
				125				160			
				No. of teeth 7N				No. of teeth 8N			
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)	$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	4	300	1,700	30.3	4	250	1,600	36.5
			150	4	270	1,400	24.9	4	220	1,200	27.4
			200	4	250	1,100	19.6	4	180	900	20.5
			250	3.5	250	900	14	3.5	180	750	15
			300	3	250	900	12	3	180	750	12.8
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	300	1,400	18.9	3	250	1,400	24.2
			150	3	270	1,100	14.8	3	220	1,000	17.3
			200	3	250	900	12.1	3	180	750	12.9
			250	2.5	250	850	9.5	2.5	180	600	8.6
			300	2.5	250	850	9.5	2.5	180	600	8.6
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER	JC5118	100	3	250	1,150	16.6	3	200	1,100	20.2
			150	3	200	800	11.5	3	150	800	14.7
			200	3	150	550	7.9	3	120	550	10.1
			250	2.5	150	500	6	2.5	120	450	6.9
			300	2.5	150	500	6	2.5	120	450	6.9
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	300	1,400	18.9	3	250	1,400	24.2
			150	3	270	1,100	14.8	3	220	1,000	17.3
			200	3	250	900	12.1	3	180	750	12.9
			250	2.5	250	850	9.5	2.5	180	600	8.6
			300	2.5	250	850	9.5	2.5	180	600	8.6
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	200	450	7.8	2.5	170	450	10
			150	2.5	150	320	5.6	2.5	150	400	8.9
			200	2.5	125	200	3.5	2.5	120	250	5.6
			250	2	125	200	2.8	2	120	220	3.9
			300	2	125	200	2.8	2	120	220	3.9
Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	5	300	2,100	33.5	5	250	2,000	40.8
			150	5	270	1,850	29.8	5	220	1,750	35.7
			200	5	250	1,500	24.4	5	180	1,450	29.5
			250	4	250	1,200	15.1	4	180	1,200	19.4
			300	3.5	250	1,200	13.3	3.5	180	1,200	17
Nodular cast iron FCD500, FCD700 (GG650, GG670) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	4	250	1,100	20.7	4	200	1,000	24.1
			150	4	230	850	16	4	170	800	19.2
			200	3	200	700	9.9	3	150	600	10.8
			250	3	200	550	7.8	3	150	500	9
			300	2.5	200	550	6.5	2.5	150	500	7.5
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	250	800	15.4	4	200	700	17.2
			150	4	200	650	12.5	4	160	600	14.7
			200	4	180	500	9.6	4	150	500	12.3
			250	3.5	180	450	7.6	3.5	150	400	8.6
			300	3	180	400	5.8	3	150	350	6.5

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.

## RECOMMENDED CUTTING CONDITIONS

## Interrupted Cutting

Work Materials	Inserts	Insert Grades	Overhung length $l$ (mm)	Tool dia. (mm)						
				200						
				No. of teeth 9N						
				$a_p$ (mm)	$n$ (min <sup>-1</sup> )	$V_f$ (mm/min)	$P_c$ (kW)			
Carbon steel S50C, S55C (C50, C55) Below 250HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	4	180	1,300	37			
			150	4	170	1,100	31.3			
			200	4	150	850	24.2			
			250	3.5	150	700	17.5			
			300	3	150	700	15			
Mold steel HPM7, PX5, KPM30 (1.2311, P20) 30-36HRC	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	180	1,200	25.9			
			150	3	170	900	19.4			
			200	3	150	700	15.1			
			250	3.5	150	550	9.9			
			300	2.5	150	550	9.9			
Mold steel NAK80, HPM1 (1.2311, P21) 38-43HRC	XDMT080620ZER	JC5118	100	3	170	1,000	23			
			150	3	150	800	18.4			
			200	3	100	500	11.5			
			250	2.5	100	400	7.7			
			300	2.5	100	400	7.7			
Die steel SKD61, SKD11 (1.2344, 1.2379) Below 255HB	XDMW080620ZTR(-ML) (XDMT080620ZER) (XDMW080620ZTR)	JC7560 (JC8050) (JC8050)	100	3	180	1,200	25.9			
			150	3	170	900	19.4			
			200	3	150	700	15.1			
			250	2.5	150	550	9.9			
			300	2.5	150	550	9.9			
Hardened die steel SKD61, DAC, DHA (1.2344, 1.2379) 40-50HRC	XDMW080620ZTR (XDMW080620ZTR)	JC5118 (JC8015)	100	2.5	140	400	11.1			
			150	2.5	120	350	9.7			
			200	2.5	100	220	6.1			
			250	2	100	200	4.4			
Grey cast iron FC250, FC300 (GG25, GG30) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	5	180	1,600	40.8			
			150	5	170	1,500	39			
			200	5	150	1,200	30.3			
			250	4	150	1,100	22.5			
Nodular cast iron FCD500, FCD700 (GGG50, GGG70) Below 300HB	XDMW080620ZTR (XDMT080620ZER) (XDMW080635ZTR-S)	JC5118 (JC8050) (JC8015)	100	4	160	900	27.1			
			150	4	140	700	21			
			200	3	120	500	11.3			
			250	3	120	400	9			
Stainless steel SUS304 Below 250HB	XDMT080620ZER(-ML) (XDMT080620ZER)	JC7560 (JC8050)	100	4	160	650	20			
			150	4	130	500	15.4			
			200	4	110	450	13.8			
			250	3.5	110	350	9.4			
			300	3	110	300	6.9			

$a_p$ : Depth of cut,  $n$ : Spindle speed,  $V_f$ : Feed speed,  $P_c$ : Net power consumption

## NOTE

- 1) The cutting parameters to be adjusted according to the machine rigidity or work rigidity.  
(Above parameter is for BT50 arbor)
- 2) In case chatter occurs, recommend to reduce depth of cut or spindle speed and feed speed.
- 3) Use air blow to flush the chips out.
- 4) We recommend to use XDMW080635ZTR-S JC8015 (negative geometry inserts) for material having sand inclusions and uneven removal stocks.