



DIE & MOLD SERIES

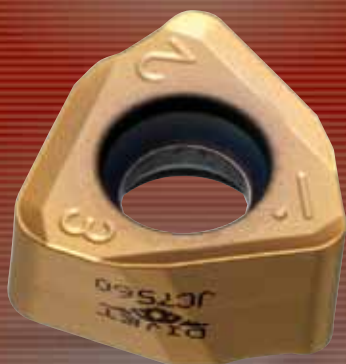
CATALOG NO. 10021

**HIGH PERFORMANCE
HIGH FEED MACHINING**

SKS **EXTREME**

Next-generation high feed machining cutter

Improved insert strength of 1.5 times
compared with conventional tool.



7.5mm
Insert Thickness

- Double-sided insert (6 corners)
- New PVD coated grade "JC7560"



Max. $a_p=3\text{mm}$ $f_z=2\text{mm}$

Possible high feed machining with
 $f_z=2\text{mm/t}$ at Max. depth of cut (a_p)=3mm.

DIJET INCORPORATED

www.dijetusa.com

SKS Extreme

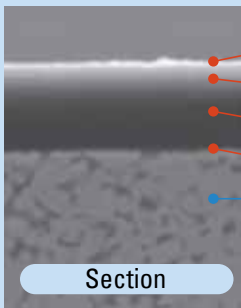
Product Feature

“SKS EXTREME” EXSKS type, next-generation high feed machining cutter

- Possible high feed machining with $f_z=2\text{mm/t}$ at max. depth of cut (a_p)=3mm.
- Economical double-sided insert (6 corners).
- Insert thickness of 7.5mm has improved strength of 1.5 times when compared to conventional tool.
- Stable high feed machining possible with long reach over $L/D=6$.
- Excellent ramping and helical interpolation, and high efficient pocket milling.
*Max. ramping angle 3° is possible with $2\frac{1}{2}"$ (63mm) diameter.
- Insert adopting new PVD coated grade “JC7560” with improved fracture toughness and achieving longer tool life.



New PVD coated grade “JC7560” against thermal shock



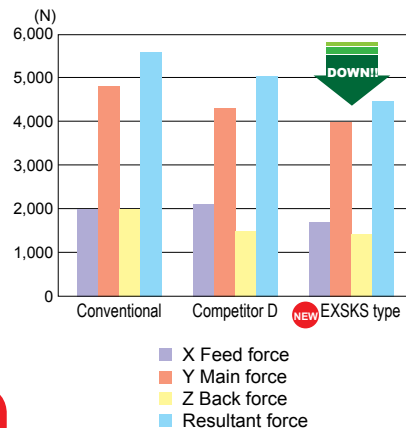
- Ti-based nitride layer with excellent welding resistance & low friction
- Al-Cr-based nitride layer improved oxidation & thermal resistance
- Ti-Al-based nitride layer improved wear & thermal resistance
- Layer improved adhesion
- Substrate improved thermal crack resistance & thermal shock resistance

- In case of rough milling, JC7560 improved heat-fracture resistance & impact strength, and achieved longer tool life.

Cutting Performance

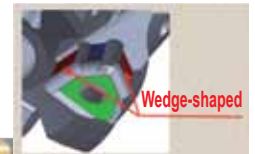
Cutting force comparison

Tool Diameter: $\phi 63\text{mm}$
Material: S50C
 $V_c=150\text{m/min}$, $f_z=1.5\text{mm/t}$,
 $a_p=1.5\text{mm}$, $a_e=40\text{mm}$



18% reduction from conventional tool,
10% reduction from competitor D

Due to wedge-shape binding on the face of insert, only single screw needed to prevent movement and indexing easy.



Adopted GN surface-hardening treatment on thermal resistant high strength steel gives high hardness of over 65HRC and secures insert pocket and holder against thermal deformation which improves body durability and tool life by 30% or more.


INCH
METRIC
SKS Extreme

FACE MILL

High Feed cutter with double sided insert

EXSK type

G-Body



Fig. 1
Through coolant hole

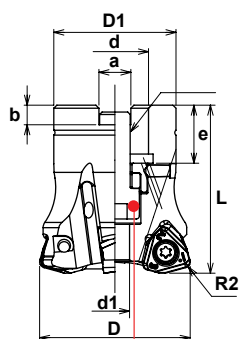


Fig. 2
Through coolant hole

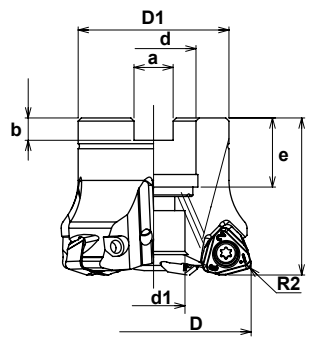
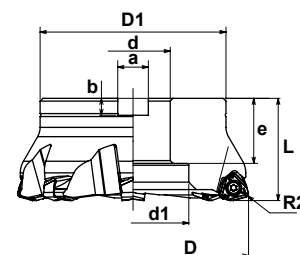


Fig. 3
Without coolant hole



Specifications - Inch

CATALOG NUMBER	STK	DIMENSIONS								FIG.	INSERT	Q	PARTS	
		D	L	d	D1	a	b	e	d1				Screw	Wrench
EXSKS-4200-75R	•	2.00	2.25	.750	1.77	.319	.196	.750	.378	1	WNMU090720ZER-PM	4	CSW-513H	A-20
EXSKS-5250-75R	•	2.50	2.00	.750	2.36	.319	.196	.750	.630	2		5		
EXSKS-6300-100R	•	3.00	2.00	1.00	2.85	.374	.236	.750	.827	2		6		
EXSKS-6300-125R	•	3.00	2.50	1.25	2.85	.500	.315	1.25	1.02	2		6		
EXSKS-7400-150R	•	4.00	2.25	1.50	3.78	.626	.393	1.50	1.19	2		7		
EXSKS-8500-150R	•	5.00	2.25	1.50	3.34	.626	.393	1.50	2.36	3		8		
EXSKS-9600-150R	•	6.00	2.25	1.50	3.93	.626	.393	1.50	2.36	3		9		

Note: All cutters are supplied without inserts.

Specifications - Metric

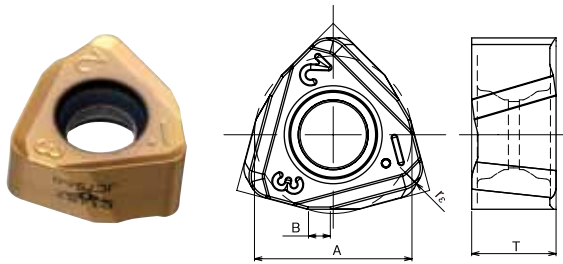
CATALOG NUMBER	STK	DIMENSIONS								FIG.	INSERT	Q	PARTS	
		D	L	d	D1	a	b	e	d1				Screw	Wrench
EXSKS-4050R	•	50	55	22.225	40	8.4	5	19	9.6	1	WNMU090720ZER-PM	4	CSW-513H	A-20
EXSKS-4050R-22	•	50	55	22	40	10.4	6.3	19	9.6	1		4		
EXSKS-4052R-22	•	52	50	22	40	10.4	6.3	20	17	2		4		
EXSKS-5063R	•	63	50	22.225	48	8.4	5	20	17	2		5		
EXSKS-5063R-22	•	63	50	22	48	10.4	6.3	20	17	2		5		
EXSKS-5063R-27	•	63	50	27	48	12.4	7	22	20	2		5		
EXSKS-5066R-27	•	66	50	27	48	12.4	7	22	20	2		5		
EXSKS-6080R	•	60	70	31.75	65	12.7	8	32	26	2		6		
EXSKS-6080R-27	•	80	55	27	65	12.4	7	22	37	3		6		
EXSKS-7100R	•	100	70	31.75	70	12.7	8	32	26	3		7		
EXSKS-7100R-32	•	100	55	32	85	14.4	8	32	45	3		7		
EXSKS-8125R	•	125	63	37.1	100	15.9	10	35	60	3		8		
EXSKS-8125R-40	•	125	55	40	100	16.4	9	35	60	3		8		
EXSKS-9160R	•	160	63	50.8	100	19	11	43	75	3		9		
EXSKS-9160R-40	•	160	55	40	100	16.4	9	35	85	3		9		

Note: All cutters are supplied without inserts.

SKS Extreme

INCH

METRIC



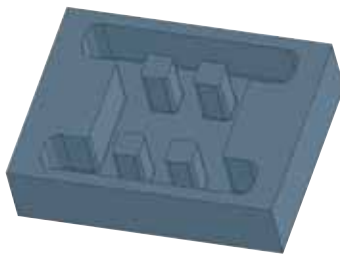
Catalog Number	Tolerance	PVD Coated		Dimensions (mm)			
		JC7560	JC5118	A	T	B	r _ε
WNMU090720ZER-PM	M	•	★	14	7.66	1.94	2

★ Coming Soon

Test Cutting Data

1. High feed machining on mold steel

Surface roughing



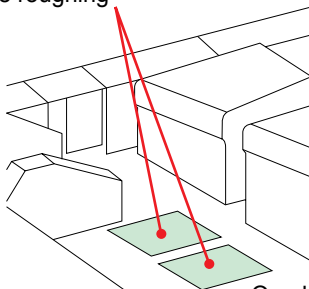
Result

Achieved high metal removal rate ($Q=756\text{cm}^3/\text{min}$) by 2.4 times compared with conventional tool. Showed normal wear after 80 min. (machining at Max. main spindle load)

Work	Part Name	Cavity mold	
	Material	Mold steel (heat-treated)	
	Hardness	30-34HRC	
Tool	Tool No.	EXSKS-7100R	
	Insert No.	WNMU090720ZER-PM (JC7560)	
Cutting Conditions	Cutting Speed	n	325 (min ⁻¹)
		V_c	102 (m/min)
	Feed Speed	V_f	3,980 (mm/min)
		f_z	1.75 (mm/t)
	ap		2.5 (mm)
	ae		76 (mm)
	Coolant		Dry
	Machine		Vertical MC (24Kw)

2. High feed machining on die structure part

Face roughing



Overhung length: 220mm

Result

No chatter, very smooth cutting. Achieved high metal removal rate by 1.9 times and longer tool life by 1.5 times compared with competitor D. Able to machine for 5 hours.

Work	Part Name	Die structure part	
	Material	FC350 GG35	
	Hardness	-	
Tool	Tool No.	EXSKS-6080R	
	Insert No.	WNMU090720ZER-PM (JC7560)	
Cutting Conditions	Cutting Speed	n	500 (min ⁻¹)
		V_c	125 (m/min)
	Feed Speed	V_f	5,000 (mm/min)
		f_z	1.66 (mm/t)
	ap		3 (mm)
	ae		47 (mm)
	Coolant		Dry
	Machine		Double column type MC

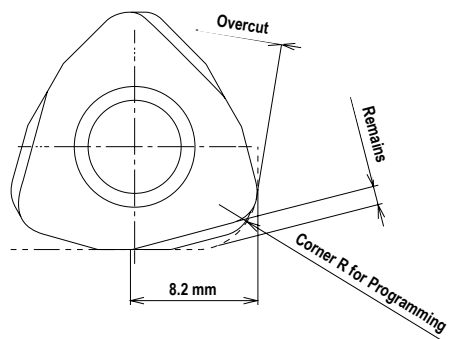


INCH

METRIC

SKS Extreme

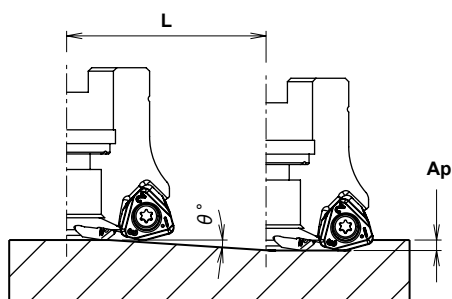
Definition of Corner Shape for Programming



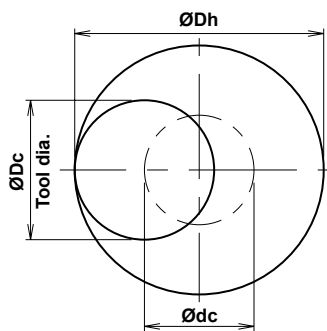
Corner R for Programming (mm)	Over cut (mm)	Remains (mm)
R3.0	0	1.41
R3.5	0	1.30
R4.0	0.025	1.19

Recommended Data for Profile Milling

● Ramping



● Helical interpolation



● Calculation of tool pass dia.

$$\text{Tool pass dia. } \varnothing D_c = \text{Bore dia. } \varnothing D_h - \text{Tool Dia. } \varnothing D_c$$

- Depth of cut per one circuit should not exceed max. depth of cut Ap
- Down cutting is recommended, so tool pass rotation should be counterclockwise

- In case of ramping and helical interpolation, apply 70% or less feed speed from standard cutting table.
- In case of drilling, apply 50% or less Z axis feed from standard cutting condition table.
- Long consecutive chips may come out in case of drilling, confirm safe operating conditions.

	CATALOG NUMBER	TOOL DIA.	EFFECTIVE CUTTING DIA.	MAX. DEPTH OF CUT: AP	RAMPING		HELICAL INTERPOLATION		MAX. DRILLING DEPTH: Z
					MAX. ANGLE	TOTAL CUTTING LENGTH AT MAX. AP: L	MIN BORE DIA.: Dh	MAX BORE DIA.: Dh	
METRIC	EXSKS-*050	50	33.7	3	2°24'	71.6	68	96	2
	EXSKS-*052	52	35.7	3	2°24'	71.6	72	100	2
	EXSKS-*063	63	46.7	3	3°	57.3	94	122	2
	EXSKS-*066	66	49.7	3	2°42'	63.7	100	128	2
	EXSKS-*080	80	63.6	3	2°18'	74.7	128	156	2
	EXSKS-*100	100	83.6	3	1°42'	101.1	168	196	2
	EXSKS-*125	125	108.5	3	1°18'	132.2	218	246	2
	EXSKS-*160	160	143.5	3	1°	171.9	288	316	2
INCH	EXSKS-*200	2"	1.36"	.12"	2°24'	2.82"	2.74"	3.84"	.08"
	EXSKS-*250	2.5"	1.86"	.12"	3°	2.26"	3.74"	4.84"	.08"
	EXSKS-*400	3"	2.36"	.12"	2°18'	2.94"	4.74"	5.84"	.08"
	EXSKS-*400	4"	3.35"	.12"	1°42'	3.98"	6.74"	7.84"	.08"
	EXSKS-*500	5"	4.35"	.12"	1°18'	5.20"	8.74"	9.84"	.08"
	EXSKS-*600	6"	5.35"	.12"	1°	6.77"	10.74"	11.84"	.08"



SKS Extreme

INCH

Recommended Cutting Conditions - Inch

Work Materials	Insert Grade	Overhung Length l (inch)	Tool Diameter (inch)											
			2				2.5				3			
			No. of Teeth 4N				No. of Teeth 5N				No. of Teeth 6N			
			AP (inch)	N (r.p.m.)	Vf (i.p.m.)	M.R.R. Q(inch ³ /min)	AP (inch)	N (r.p.m.)	Vf (i.p.m.)	M.R.R. Q(inch ³ /min)	AP (inch)	N (r.p.m.)	Vf (i.p.m.)	M.R.R. Q(inch ³ /min)
Carbon Steel (C50, C55) Below 250HB	JC7560	6	.078	950	300	32.8	.078	750	300	41.0	.078	600	283	46.4
		8	.059	800	189	15.6	.071	680	267	33.2	.071	540	255	38.0
		10	.039	650	133	7.3	.059	600	236	24.4	.071	480	227	33.8
		12	.024	650	102	3.4	.039	550	217	14.8	.059	440	208	25.8
		14	-	-	-	-	.024	550	217	9.1	.039	440	208	17.0
		16	-	-	-	-	.016	550	217	6.1	.024	440	208	10.5
Mold Steel (1.2311, P20) 30-36HRC	JC7560	6	.078	830	260	28.4	.078	650	256	34.9	.078	520	246	40.3
		8	.059	700	165	13.6	.071	580	228	28.3	.071	470	222	33.1
		10	.039	570	117	6.4	.059	520	205	21.2	.071	420	198	29.5
		12	.024	570	90	3.0	.039	460	181	12.4	.059	360	170	21.1
		14	-	-	-	-	.024	460	181	7.6	.039	360	170	13.9
		16	-	-	-	-	.016	460	181	5.1	.024	360	170	8.6
Die Steel (1.2344, 1.2379) Below 255HB	JC7560	6	.078	950	300	32.8	.078	750	295	40.3	.078	600	283	46.4
		8	.059	800	189	15.6	.071	680	268	33.3	.071	540	255	38.0
		10	.039	650	133	7.3	.059	600	236	24.4	.071	480	227	33.8
		12	.024	650	102	3.4	.039	550	216	14.7	.059	440	208	25.8
		14	-	-	-	-	.024	550	216	9.1	.039	440	208	17.0
		16	-	-	-	-	.016	550	216	6.0	.024	440	208	10.5
Gray & Nodular Cast Iron (GG, GGG) Below 300HB	JC7560	6	.098	950	300	41.2	.098	750	295	50.6	.098	600	284	58.4
		8	.078	800	189	20.6	.078	680	268	36.6	.078	540	255	41.8
		10	.059	650	133	11.0	.059	600	236	24.4	.078	480	227	37.2
		12	.039	650	102	5.6	.039	550	216	14.7	.059	440	208	25.8
		14	-	-	-	-	.024	550	216	9.1	.039	440	208	17.0
		16	-	-	-	-	.016	550	216	6.0	.024	440	208	10.5

AP: Depth of cut, N: Spindle speed, Vf: Speed feed, Pc: Net power consumption

Work Materials	Insert Grade	Overhung Length l (inch)	Tool Diameter (inch)											
			4				5				6			
			No. of Teeth 7N				No. of Teeth 8N				No. of Teeth 9N			
			AP (inch)	N (r.p.m.)	Vf (i.p.m.)	M.R.R. Q(inch ³ /min)	AP (inch)	N (r.p.m.)	Vf (i.p.m.)	M.R.R. Q(inch ³ /min)	AP (inch)	N (r.p.m.)	Vf (i.p.m.)	M.R.R. Q(inch ³ /min)
Carbon Steel (C50, C55) Below 250HB	JC7560	6	.078	480	265	57.9	.078	380	239	65.2	.078	300	213	69.8
		8	.078	430	237	51.8	.078	340	214	58.4	.078	270	191	62.6
		10	.078	380	209	45.6	.078	300	189	51.6	.078	240	170	55.7
		12	.059	350	193	31.9	.078	280	176	48.0	.078	220	156	51.1
		14	.059	350	193	31.9	.059	280	176	36.3	.078	220	156	51.1
		16	.039	350	193	21.1	.059	280	176	36.3	.059	220	156	38.7
Mold Steel (1.2311, P20) 30-36HRC	JC7560	6	.078	410	226	49.4	.078	330	208	56.8	.078	260	184	60.3
		8	.078	370	204	44.6	.078	300	189	51.6	.078	230	163	53.4
		10	.078	330	182	39.7	.078	260	164	44.8	.078	210	149	48.8
		12	.059	280	154	25.4	.078	230	145	39.6	.078	180	128	41.9
		14	.059	280	154	25.4	.059	230	145	29.9	.078	180	128	41.9
		16	.039	280	154	16.8	.059	230	145	29.9	.059	180	128	31.7
Die Steel (1.2344, 1.2379) Below 255HB	JC7560	6	.078	480	265	57.9	.078	380	239	65.2	.078	300	213	69.8
		8	.078	430	237	51.8	.078	340	214	58.4	.078	270	191	62.6
		10	.078	380	209	45.6	.078	300	189	51.6	.078	240	170	55.7
		12	.059	350	193	31.9	.078	280	176	48.0	.078	220	156	51.1
		14	.059	350	193	31.9	.059	280	176	36.3	.078	220	156	51.1
		16	.039	350	193	21.1	.059	280	176	36.3	.059	220	156	38.7
Gray & Nodular Cast Iron (GG, GGG) Below 300HB	JC7560	6	.098	480	265	72.7	.098	380	239	82.0	.098	300	213	87.7
		8	.098	430	237	65.0	.098	340	214	73.4	.098	270	191	78.6
		10	.078	380	209	45.6	.098	300	189	64.8	.098	240	170	70.0
		12	.078	350	193	42.2	.078	280	176	48.0	.098	220	156	64.2
		14	.059	350	193	31.9	.059	280	176	36.3	.078	220	156	51.1
		16	.039	350	193	21.1	.059	280	176	36.3	.059	220	156	38.7

AP: Depth of cut, N: Spindle speed, Vf: Speed feed, Pc: Net power consumption

Notes:

1. The figures should be adjusted according to the machine and work rigidity.
2. If chattering occurs, reduce the DOC (AP) or RPM by 30% and keep the feed per tooth the same.
3. If machine does not have enough power, the DOC (AP) or spindle speed should be reduced by 30%.
4. Use air instead of coolant.

**METRIC****SKS Extreme****Recommended Cutting Conditions - Metric**

Work Materials	Insert Grade	Tool Diameter														
		50/52					63/66					80				
		No. of Teeth 4N					No. of Teeth 5N					No. of Teeth 6N				
		ℓ (mm)	AP (mm)	N (min ⁻¹)	Vf (mm/min)	Pc (kW)	ℓ (mm)	AP (mm)	N (min ⁻¹)	Vf (mm/min)	Pc (kW)	ℓ (mm)	AP (mm)	N (min ⁻¹)	Vf (mm/min)	Pc (kW)
Carbon Steel (C50, C55) (S50C, S55C0) Below 250HB	JC7560	150	2	950	7,600	12.4	150	2	750	7,500	15.4	150	2	600	7,200	18.7
		200	1.5	800	4,800	5.9	200	1.8	680	6,800	12.5	200	1.8	540	6,480	15.2
		250	1	650	3,380	2.7	250	1.5	600	6,000	9.2	250	1.8	480	5,760	13.5
		300	0.6	650	2,600	1.3	300	1	550	5,500	5.6	300	1.5	440	5,280	10.3
		350	-	-	-	-	350	0.6	550	5,500	3.4	350	1	440	5,280	6.9
		400	-	-	-	-	400	0.4	550	5,500	2.3	400	0.6	440	5,280	4.1
Mold Steel (1.2311, P20) (HPM7, PX5, P20) 30-36HRC	JC7560	150	2	830	6,640	12.3	150	2	650	6,500	15.2	150	2	520	6,240	18.5
		200	1.5	700	4,200	5.9	200	1.8	580	5,800	12.2	200	1.8	470	5,640	15.1
		250	1	570	2,960	2.7	250	1.5	520	5,200	9.1	250	1.8	420	5,040	13.5
		300	0.6	570	2,280	1.3	300	1	460	4,600	5.4	300	1.5	360	4,320	9.6
		350	-	-	-	-	350	0.6	460	4,600	3.2	350	1	360	4,320	6.4
		400	-	-	-	-	400	0.4	460	4,600	2.2	400	0.6	360	4,320	3.9
Die Steel (1.2344, 1.2379) (SKD61, SKD11) Below 255HB	JC7560	150	2	950	7,600	12.4	150	2	750	7,500	15.4	150	2	600	7,200	18.7
		200	1.5	800	4,800	5.9	200	1.8	680	6,800	12.5	200	1.8	540	6,480	15.2
		250	1	650	3,380	2.7	250	1.5	600	6,000	9.2	250	1.8	480	5,760	13.5
		300	0.6	650	2,600	1.3	300	1	550	5,500	5.6	300	1.5	440	5,280	10.3
		350	-	-	-	-	350	0.6	550	5,500	3.4	350	1	440	5,280	6.9
		400	-	-	-	-	400	0.4	550	5,500	2.3	400	0.6	440	5,280	4.1
Gray & Nodular Cast Iron (GG, GGG) (FC, FCD) Below 300HB	JC7560	150	2.5	950	7,600	12.4	150	2.5	750	7,500	15.4	150	2.5	600	7,200	18.7
		200	2	800	4,800	6.2	200	2	680	6,800	11.1	200	2	540	6,480	13.5
		250	1.5	650	3,380	3.3	250	1.5	600	6,000	7.4	250	2	480	5,760	12.0
		300	1	650	2,600	1.7	300	1	550	5,500	4.5	300	1.5	440	5,280	8.2
		350	-	-	-	-	350	0.6	550	5,500	2.7	350	1	440	5,280	5.5
		400	-	-	-	-	400	0.4	550	5,500	1.8	400	0.6	440	5,280	3.3

ℓ : Overhung length, AP: Depth of cut, N: Spindle speed, Vf: Speed feed, Pc: Net power consumption

Work Materials	Insert Grade	Tool Diameter														
		100					125					160				
		No. of Teeth 7N					No. of Teeth 8N					No. of Teeth 9N				
		ℓ (mm)	AP (mm)	N (min ⁻¹)	Vf (mm/min)	Pc (kW)	ℓ (mm)	AP (mm)	N (min ⁻¹)	Vf (mm/min)	Pc (kW)	ℓ (mm)	AP (mm)	N (min ⁻¹)	Vf (mm/min)	Pc (kW)
Carbon Steel (C50, C55) (S50C, S55C0) Below 250HB	JC7560	150	2	480	6,720	21.8	150	2	380	6,080	24.7	150	2	300	5,400	28.1
		200	2	430	6,020	19.6	200	2	340	5,440	22.1	200	2	270	4,860	25.3
		250	2	380	5,320	17.3	250	2	300	4,800	19.5	250	2	240	4,320	22.5
		300	1.5	350	4,900	11.9	300	2	280	4,480	18.2	300	2	220	3,960	20.6
		350	1.5	350	4,900	11.9	350	1.5	280	4,480	13.7	350	2	220	3,960	20.6
		400	1	350	4,900	8.0	400	1.5	280	4,480	13.7	400	1.5	220	3,960	15.4
Mold Steel (1.2311, P20) (HPM7, PX5, P20) 30-36HRC	JC7560	150	2	410	5,740	21.3	150	2	330	5,280	24.5	150	2	260	4,680	27.8
		200	2	370	5,180	19.2	200	2	300	4,800	22.3	200	2	230	4,140	24.6
		250	2	330	4,620	17.2	250	2	260	4,160	19.3	250	2	210	3,780	22.5
		300	1.5	280	3,920	10.9	300	2	230	3,680	17.1	300	2	180	3,240	19.3
		350	1.5	280	3,920	10.9	350	1.5	230	3,680	12.8	350	2	180	3,240	19.3
		400	1	280	3,920	7.3	400	1.5	230	3,680	12.8	400	1.5	180	3,240	14.4
Die Steel (1.2344, 1.2379) (SKD61, SKD11) Below 255HB	JC7560	150	2	480	6,720	21.8	150	2	380	6,080	24.7	150	2	300	5,400	28.1
		200	2	430	6,020	19.6	200	2	340	5,440	22.1	200	2	270	4,860	25.3
		250	2	380	5,320	17.3	250	2	300	4,800	19.5	250	2	240	4,320	22.5
		300	1.5	350	4,900	11.9	300	2	280	4,480	18.2	300	2	220	3,960	20.6
		350	1.5	350	4,900	11.9	350	1.5	280	4,480	13.7	350	2	220	3,960	20.6
		400	1	350	4,900	8.0	400	1.5	280	4,480	13.7	400	1.5	220	3,960	15.4
Gray & Nodular Cast Iron (GG, GGG) (FC, FCD) Below 300HB	JC7560	150	2.5	480	6,720	21.8	150	2.5	380	6,080	24.7	150	2.5	300	5,400	28.1
		200	2.5	430	6,020	19.6	200	2.5	340	5,440	22.1	200	2.5	270	4,860	25.3
		250	2	380	5,320	13.8	250	2.5	300	4,800	19.5	250	2.5	240	4,320	22.5
		300	2	350	4,900	12.7	300	2	280	4,480	14.6	300	2.5	220	3,960	20.6
		350	1.5	350	4,900	9.6	350	1.5	280	4,480	10.9	350	2	220	3,960	16.5
		400	1	350	4,900	6.4	400	1.5	280	4,480	10.9	400	1.5	220	3,960	12.4

ℓ : Overhung length, AP: Depth of cut, N: Spindle speed, Vf: Speed feed, Pc: Net power consumption

Notes:

- The figures should be adjusted according to the machine and work rigidity.
- If chattering occurs, reduce the DOC (AP) or RPM by 30% and keep the feed per tooth the same.
- If machine does not have enough power, the DOC (AP) or spindle speed should be reduced by 30%.
- Use air instead of coolant.

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