Material Groups

Recommended Machining Conditions

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material No.[1]	V m/min	HCP/QCP Feed vs. Drill Diameter D=4-4.9	D=5-5.9	D=6-7.9	D=8-9.9	D=10-11.9	D=12-13.9	D=14-15.9	D=16-19.9	D=20-25.9	D=26-32.9
										mm/rev							
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1	80-**110**-140	0.04	0.07	0.09	0.12	0.15	0.18	0.20	0.25	0.25	0.30
		≥ 0.25 %C	Annealed	650	190	2	80-**105**-130	**0.06**	**0.09**	**0.11**	**0.17**	**0.21**	**0.24**	**0.27**	**0.35**	**0.35**	**0.40**
		< 0.55 %C	Quenched and tempered	850	250	3	80-**100**-120	0.08	0.11	0.13	0.22	0.28	0.30	0.35	0.45	0.45	0.50
		≥ 0.55 %C	Annealed	750	220	4	70-**90**-110										
			Quenched and tempered	1000	300	5	50-**70**-90										
	Low alloy and cast steel (less than 5% of alloying elements)		Annealed	600	200	6	80-**100**-120	0.04	0.07	0.09	0.12	0.14	0.16	0.18	0.23	0.25	0.30
			Quenched and tempered	930	275	7	70-**90**-110	**0.06**	**0.09**	**0.12**	**0.18**	**0.21**	**0.24**	**0.26**	**0.31**	**0.35**	**0.40**
				1000	300	8	50-**70**-90	0.08	0.11	0.15	0.25	0.28	0.32	0.35	0.40	0.45	0.50
				1200	350	9	40-**55**-70										
	High alloyed steel, cast steel and tool steel		Annealed	680	200	10	50-**70**-90	0.06	0.07	0.09	0.12	0.12	0.15	0.18	0.20	0.22	0.25
			Quenched and tempered	1100	325	11	40-**60**-80	**0.07**	**0.09**	**0.11**	**0.16**	**0.17**	**0.20**	**0.23**	**0.25**	**0.27**	**0.30**
								0.08	0.10	0.12	0.20	0.22	0.25	0.28	0.30	0.33	0.35
	Stainless steel and cast steel		Ferritic/ martensitic	680	200	12	40-**55**-70	0.05	0.06	0.08	0.11	0.11	0.14	0.17	0.22	0.21	0.24
								0.06	**0.07**	**0.10**	**0.15**	**0.16**	**0.19**	**0.22**	**0.24**	**0.26**	**0.29**
			Martensitic	820	240	13		0.07	0.08	0.11	0.19	0.21	0.24	0.27	0.29	0.32	0.34
K	Gray cast iron (GG)		Ferritic/ pearlitic		180	15	90-**125**-160	0.04	0.10	0.12	0.15	0.20	0.25	0.30	0.35	0.35	0.40
			Pearlitic/ martensitic		260	16	80-**110**-140	**0.06**	**0.13**	**0.15**	**0.22**	**0.27**	**0.32**	**0.37**	**0.45**	**0.47**	**0.50**
	Nodular cast iron (GGG)		Ferritic		160	17	90-**135**-180	0.08	0.15	0.18	0.30	0.35	0.40	0.45	0.55	0.60	0.60
			Pearlitic		250	18	80-**110**-140										
	Malleable cast iron		Ferritic		130	19	90-**125**-160										
			Pearlitic		230	20	80-**110**-140										

Recommended cutting data

(1) For workpiece materials list, see pages 495-524 . As a starting value, the middle of the recommended machining range should be used.

Then, according to the wear results, conditions can be changed to optimize performance.

The data refers to IC908

- When using external coolant supply only, reduce cutting speed by 10%
- When using more than 5XD drill ratio, reduce cutting parameters by 10%

No need to reduce the cutting parameters while using 8XD and up holders