

Material Groups

Recommended Machining Conditions

ISO	Material	Condition	Tensile Strength [N/mm ²]	Hardness HB	Mtl. No.	V m/min	SUMOCHAM								
							Feed vs. Drill Diameter								
							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								
		>= 0.25 %C	Annealed	650	190	2	80- 105 -130	0.09	0.12	0.15	0.18	0.20	0.25	0.25	0.30
		< 0.55 %C	Quenched and tempered	850	250	3	80- 100 -120	0.11	0.17	0.21	0.24	0.27	0.35	0.35	0.40
		>= 0.55 %C	Annealed	750	220	4	70- 90 -110	0.13	0.22	0.28	0.30	0.35	0.45	0.45	0.50
			Quenched and tempered	1000	300	5	50- 70 -90								
	Low alloy steel and cast steel (less than 5% of alloying elements)	Annealed	600	200	6	80- 100 -120									
		Quenched and tempered	930	275	7	70- 90 -110	0.09	0.12	0.14	0.16	0.18	0.23	0.25	0.30	
			1000	300	8	50- 70 -90	0.12	0.18	0.21	0.24	0.26	0.31	0.35	0.40	
		1200	350	9	40- 55 -70	0.15	0.25	0.28	0.32	0.35	0.40	0.45	0.50		
	High alloyed steel, cast steel, and tool steel	Annealed	680	200	10	50- 70 -90	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	0.11	0.16	0.17	0.20	0.23	0.25	0.27	0.30		
Stainless steel and cast steel	Ferritic/martensitic	680	200	12	40- 55 -70	0.08	0.10	0.12	0.14	0.16	0.16	0.18	0.20		
	Martensitic	820	240	13	40- 55 -70	0.09	0.12	0.15	0.17	0.20	0.21	0.24	0.27		
M	Stainless steel	Austenitic	600	180	14	30- 50 -70	0.08	0.10	0.12	0.14	0.16	0.16	0.18	0.20	
							0.09	0.12	0.15	0.17	0.20	0.21	0.24	0.27	
K	Grey cast iron (GG)	Ferritic/pearlitic		180	15	90- 125 -160									
		Pearlitic		260	16	80- 110 -140									
	Nodular cast iron (GGG)	Ferritic		160	17	90- 135 -180	0.12	0.15	0.20	0.25	0.30	0.35	0.35	0.40	
		Pearlitic		250	18	80- 110 -140	0.15	0.22	0.27	0.32	0.37	0.45	0.47	0.50	
	Malleable cast iron	Ferritic		130	19	90- 125 -160	0.18	0.30	0.35	0.40	0.45	0.55	0.60	0.60	
		Pearlitic		230	20	80- 110 -140									
N	Aluminum-wrought alloy	Not cureable		60	21										
		Cured		100	22	90- 155 -220									
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23									
		Cured		90	24		0.20	0.25	0.30	0.35	0.40	0.45	0.50		
	>12% Si	High temperature		130	25	80- 120 -160	0.27	0.32	0.37	0.42	0.50	0.57	0.67		
	Copper alloys	>1% Pb	Free cutting		110	26		0.35	0.40	0.45	0.50	0.60	0.70	0.75	
		Brass		90	27	90- 155 -220									
		Electrolitic copper		100	28										
	Non-metallic	Duroplastics, fiber plastics				29									
		Hard rubber				30									
S	High temp. alloys	Fe based	Annealed		200	31	30- 45 -60								
			Cured		280	32		0.05	0.06	0.08	0.10	0.12	0.12	0.14	0.16
		Ni or Co based	Annealed		250	33	20- 35 -50	0.06	0.08	0.10	0.12	0.15	0.16	0.18	0.20
			Cured		350	34		0.07	0.11	0.13	0.15	0.18	0.20	0.22	0.25
			Cast		320	35									
	Titanium Ti alloys		RM 400			36	20- 35 -50	0.05	0.06	0.08	0.10	0.12	0.14	0.16	0.18
		Alpha+beta alloys cured	RM 1050			37		0.06	0.09	0.11	0.14	0.16	0.18	0.20	0.22
H	Hardened steel	Hardened		55 HRC	38	20- 35 -50	0.05	0.06	0.08	0.10	0.12	0.14	0.16	0.18	
		Hardened		60 HRC	39		0.06	0.09	0.11	0.14	0.16	0.18	0.20	0.22	

- When using external coolant supply only, reduce cutting speed by 10%.
- Use internal coolant supply when machining austenitic stainless steel.
- When using more than 5XD drill ratio, reduce cutting parameters by 10%.
- Recommended cutting data
- Machining Stainless Steel is not recommended with QCP & HCP geometry

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