

Machining Recommendations

ISO	Material	Condition	Tensile Strength [N/mm ²]	Material Group No. ⁽¹⁾	Hardness HB	Chipbreaker			Adjustable Solid Drill Heads DSD-EC, DDD-EC, DSD-IC							
						First Choice	Troubleshooting		Dia. Range	38.00-39.99	40.00-51.99	52.00-63.99	64.00-84.99	85.00-293.00		
							Fracture	Wear	V _c (m/min)	Feed Rate f (mm/rev)						
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	1	125	G IC908	BG IC806	B IC9025	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
		>= 0.25 %C	Annealed	650	2	190				60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
		< 0.55 %C	Quenched and tempered	850	3	250				60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
		>= 0.55 %C	Annealed	750	4	220				60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
			Quenched and tempered	1000	5	300				60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
	Low alloy and cast steel (less than 5% of alloying elements)	Quenched and tempered	Annealed	600	6	200	G IC908	BG IC806	B IC9025	60-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
				930	7	275				60-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
				1000	8	300				50-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
				1200	9	350				50-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3	
	High alloyed steel, cast steel and tool steel	Annealed	680	10	200	G IC908	BG IC806	B IC9025	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3		
		Quenched and tempered	1100	11	325				60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3		
	Stainless steel and cast steel	Ferritic/martensitic	680	12	200	G IC908	BG IC806	B IC9025	60-110	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3		
		Martensitic	820	13	240				60-110	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3		
M	Stainless steel and cast steel	Austenitic, duplex	600	14	180	G IC806	B IC908	B IC9025	60-110	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3		
K	Grey cast iron (GG)	Ferritic/pearlitic		15	180	G IC908	G IC806	B IC9025	80-140	0.20-0.30	0.20-0.30	0.24-0.32	0.24-0.32	0.25-0.40		
		Pearlitic/martensitic		16	260				80-140	0.20-0.30	0.20-0.30	0.24-0.32	0.24-0.32	0.25-0.40		
	Nodular cast iron (GGG)	Ferritic		17	160				80-140	0.20-0.30	0.20-0.30	0.24-0.32	0.24-0.32	0.25-0.40		
		Pearlitic		18	250				80-140	0.20-0.30	0.20-0.30	0.24-0.32	0.24-0.32	0.25-0.40		
	Malleable cast iron	Ferritic		19	130				80-140	0.20-0.30	0.20-0.30	0.24-0.32	0.24-0.32	0.25-0.40		
		Pearlitic		20	230				80-140	0.20-0.30	0.20-0.30	0.24-0.32	0.24-0.32	0.25-0.40		
N	Aluminum-wrought alloys	Not hardenable		21	60	G IC908	G IC806	B IC9025	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33		
		Hardenable		22	100				100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33		
	Aluminum-cast alloys	<=12% Si	Not hardenable		23				75	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
			Hardenable		24				90	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
		>12% Si	High temperature		25				130	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
	Copper alloys	>1% Pb	Free cutting		26				110	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
			Brass		27				90	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
			Electrolitic copper		28				100	100-200	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
	Non-metallic		Duroplastics, fiber plastics		29					60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
			Hard rubber		30					60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33	
S	High temp. alloys	Fe based	Annealed		31	200	B IC806	B IC908	B IC9025	20-65	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28	
				Hardened		32				280	20-65	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28
		Ni or Co based	Annealed		33	250				20-65	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28	
				Hardened		34				350	30-100	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28
				Cast		35				320	30-100	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28
	Titanium alloys	Pure	400	36		30-60				0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28		
		Alpha+beta alloys hardened	1050	37		30-60				0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.18-0.28		
H	Hardened steel		Hardened 55 HRC		38	B IC806	B IC908	B IC908	30-80	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.15-0.28		
			Hardened 60 HRC		39				30-80	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.15-0.28		
	Chilled cast iron	Cast		40	400				30-80	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.15-0.28		
	Cast iron	Hardened 55 HRC		41					30-80	0.06-0.13	0.08-0.18	0.13-0.23	0.13-0.23	0.15-0.28		

⁽¹⁾ Based on ISO 513 and VDI 3323 standards