

Recommended Machining Conditions

ISO	Material	Condition	Tensile Strength [ksi]	Hardness HB	Material Group No. ⁽¹⁾	Adjustable Solid Drill Heads ISD-EC, IDD-EC, ISD-IC						
						Dia. Range	1.496-1.574	1.575-2.047	2.0472-2.519	2.520-3.346	3.3464-	
						V _c (SFM)	Feed Rate f (IPR)					
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	61	125	1	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
		≥ 0.25 %C	Annealed	94	190	2	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
		< 0.55 %C	Quenched and tempered	123	250	3	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
		≥ 0.55 %C	Annealed	109	220	4	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
			Quenched and tempered	145	300	5	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
	Low alloy and cast steel (less than 5% of alloying elements)	Annealed	87	200	6	195 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
		Quenched and tempered	135	275	7	195 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
			145	300	8	165 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
	High alloyed steel, cast steel and tool steel	174	350	9	165 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012		
		Annealed	99	200	10	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
	Stainless steel and cast steel	Quenched and tempered	160	325	11	195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
		Ferritic/martensitic	99	200	12	195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
		Martensitic	119	240	13	195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
M	Stainless steel and cast steel	Austenitic, duplex	87	180	14	195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012	
K	Gray cast iron (GG)	Ferritic / pearlitic		180	15	195 - 330	.003 - .005	.004 - .006	.005 - .007	.006 - .008	.007 - .009	
		Pearlitic / martensitic		260	16	195 - 330	.003 - .005	.004 - .006	.005 - .007	.006 - .008	.007 - .009	
	Nodular cast iron (GGG)	Ferritic		160	17	195 - 330	.003 - .005	.004 - .006	.005 - .007	.006 - .008	.007 - .009	
		Pearlitic		250	18	195 - 330	.003 - .005	.004 - .006	.005 - .007	.006 - .008	.007 - .009	
	Malleable cast iron	Ferritic		130	19	195 - 330	.003 - .005	.004 - .006	.005 - .007	.006 - .008	.007 - .009	
		Pearlitic		230	20	195 - 330	.003 - .005	.004 - .006	.005 - .007	.006 - .008	.007 - .009	
N	Aluminum-wrought alloys	Not hardenable		60	21	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013	
		Hardenable		100	22	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013	
	Aluminum-cast alloys	≤12% Si	Not hardenable		75	23	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
			Hardenable		90	24	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
	Copper alloys	>12% Si	High temperature		130	25	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
		>1% Pb	Free cutting		110	26	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
			Brass		90	27	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
			Electrolytic copper		100	28	195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
	Non metallic	Duroplastics, fiber plastics				29	65 - 215	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
		Hard rubber				30	65 - 215	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
S	High temperature alloys	Fe based	Annealed		200	31	65 - 215	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
			Hardened		280	32	65 - 215	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
		Ni or Co based	Annealed		250	33	65 - 215	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
			Hardened		350	34	100 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
			Cast		320	35	100 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
	Titanium alloys	Pure		58	36							
	Alpha+beta alloys, hardened		152	37								
H	Hardened steel	Hardened		55 HRC	38							
		Hardened		60 HRC	39							
	Chilled cast iron	Cast		400	40							
	Cast iron	Hardened		55 HRC	41							

⁽¹⁾ Based on ISO 513 and VDI 3323 standards