

Material Group

STEP 1 - Identify workpiece Material Group



DIN ISO 513	Material	Condition	Tensile Strength (Kpsi)	Hardness HB	Material Group # VDI 3323	Trade Names		
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C Annealed	61	125	1	1010, 1015, 1018, 1020, 1023, 1102, 1108, 1109, 1213, 12L13, 1215		
		>=0.25%C Annealed	94	190	2	1025, 1030, 1035, 1040, 1045, 1050, 1140, 1141, 1330		
		<0.55%C Quenched and tempered	123	250	3	1025, 1030, 1035, 1040, 1045, 1050, 1140, 1141, 1330		
		>=0.55%C Annealed	109	220	4	1055, 1060, 1070, 1080, 1151, W112		
	Low alloy steel and cast steel (Less than 5% of alloying elements)	Quenched and tempered	145	300	5	1055, 1060, 1151		
		Annealed	87	200	6	3135, 3435, 3440, 4130, 4140, 4150, 4320, 4340, 5015, 5060, 5120, 5132, 5140, 5160, 6150, 8620, 8640, 9254, 9255, 9262, L1, L2, L3, O1, O2, S1, P2, P3, P5, P20, W1, W2, W5, 51100, 52100,		
		Quenched and tempered	135	275	7			
			145	300	8			
			174	350	9			
	High alloy steel, cast steel and tool steel	Annealed	99	200	10	A2, A3, A4, A,6 A7, A10, D2, D3, D4, D5, D7, H11, H12, H13, H14, H17, H22, H23, S7, M1, M2, M3, M4, M6, M7, M10, M30, M42, T1, T2, T4, T5,		
Quenched and tempered		160	325	11				
M	Stainless steel and cast steel	Ferritic/martensitic	99	200	12	203, 303, 303Plus X, 303Pb, 409, 430, 430F, 440, 444		
		Martensitic	119	240	13	410, 420, 431, 440A, 416		
		Austenitic	87	180	14	304, 310, 316, 316L, 317, Nitronic 40, Carpenter 20, 13-8, 15-5, 17-4		
K	Gray cast iron (GG)	Ferritic		180	15	ASTM A48 Classes 20, 25, SAEJ431c grades G1800, G2000, G2500		
		Pearlitic		260	16	ASTM A48 Classes 30, 35, 40, 45, 50, SAEJ431c grades G3000, G3500		
	Cast iron nodular (GGG)	Ferritic		160	17	60-40-18, 65-45-12		
		Pearlitic		250	18	80-55-06, 100-70-03, 120-90-02		
	Malleable cast iron	Ferritic		130	19	22010, 325110		
		Pearlitic		230	20	40010, 50005, 70003, 90001		
N	Aluminum - Wrought alloy	Not cureable		60	21	1000, 2011, 2014, 2124, 2024, 6061, 7075		
		Cured		100	22			
	Aluminum - cast, alloyed	<=12% Si Not cureable		75	23	319, 383, 356, 413, 535, A280, A380, A413		
		Cured		90	24			
		>12% Si High temp		130	25			
	Copper alloys	>1% Pb Free cutting		110	26	C23000, C36000, C83600, C93200, C93600		
		Brass		90	27	C18200, C27200, C27700, C86500, Red Brass		
		Electrolitic copper		100	28	B-148-52, C63000, C81500, C90700, C90800		
	Non-metallic	Duroplastics, fiber plastics			29			
		Hard rubber			30			
S	High temp. alloys	Fe based Annealed		200	31	A286, Incoloy 800, Incoloy 801, Incoloy 802, N-155, W-545		
			Cured		280		32	
		Ni or Co based Annealed		250	33		Astroloy, Hastelloy, C-272, IN-100, Inconel 625, Inconel 718, Inconel 750, Numonic, Rene, Udimet, Waspaoly, Haynes, Stellite, AR213, MP35N	
			Cured		350			34
			Cast		320			35
	Titanium, Ti alloys		Rm 58		36	Grade 1, Grade 2, Grade 2H, Grade 3		
		Alpha+beta alloys cured	Rm 152		37	Grade 5, Ti6AL4V, Ti6-4		
H	Hardened steel	Hardened		55 HRC	38	Hardox 400, Hardox 500, W1, W210		
		Hardened		60 HRC	39	HSS, 90 MnV8		
	Chilled cast iron	Cast		400	40	Ni-Hard 1, Ni-Hard 2, Ni-Hard 4, A532, GX300		
	Cast iron nodular	Hardened		55 HRC	41			

ISO-Turning, Ceramic - Cutting Speeds

OPG-006 (07/2021)



STEP 2 - Locate Cutting Speed by Insert Grade & Material Group

DIN ISO 513	Material Group # VDI 3323	Cutting Speed (SFM)								
		Ceramic								
		AW120	AB2010	AB20	AB30	TC430	TC3020	TC3030	AS500	SC10 AS10
P	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
M	12									
	13									
	14									
K	15	1970-3935			1970-3935				1970-3280	1640-2950
	16	1640-2950			1640-2950				1640-2950	1475-2625
	17				1475-2000				1475-2130	1130-1900
	18				1150-1675				985-1805	820-1575
	19	1970-2625			1970-2625				1640-2625	1640-2425
	20	1640-2295			1640-2295				1475-2460	1310-2100
N	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30									
S	31									
	32									
	33					885-1310	820-1200	740-1000		
	34					755-1080	700-950	575-750		
	35					690-985	625-925	515-700		
	36									
	37									
H	38		315-475	295-460	165-330					
	39		250-400	200-350						
	40				195-395					
	41				165-330					