

Recommended initial metric cutting parameters

ISO	Material	Condition	Tensile Strength [N/mm ²]	Hardness HB	Material No. ⁽¹⁾	Cutting Parameters			
						v _c [m/min]	f _z [mm/t]	f _z start [mm/t]	
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1	210 - 300	0.005 - 0.01xD	0.006xD
		>= 0.25 %C	Annealed	650	190	2	200 - 250	0.005 - 0.01xD	0.006xD
		< 0.55 %C	Quenched and tempered	850	250	3	160 - 240	0.004 - 0.009xD	0.005xD
		>= 0.55 %C	Annealed	750	220	4	160 - 240	0.003 - 0.008xD	0.004xD
			Quenched and tempered	1000	300	5	140 - 200	0.004 - 0.009xD	0.005xD
	Low alloy steel and cast steel (less than 5% of alloying elements)	Annealed	600	200	6	160 - 240	0.003 - 0.008xD	0.004xD	
		Quenched and tempered	930	275	7	120 - 200	0.003 - 0.008xD	0.004xD	
			1000	300	8	130 - 200	0.003 - 0.008xD	0.004xD	
			1200	350	9	140 - 200	0.003 - 0.008xD	0.004xD	
	High alloyed steel, cast steel, and tool steel	Annealed	680	200	10	130 - 200	0.003 - 0.008xD	0.004xD	
		Quenched and tempered	1100	325	11	70 - 130	0.002 - 0.007xD	0.003xD	
	Stainless steel and cast steel	Ferritic/martensitic	680	200	12	80 - 175	0.002 - 0.007xD	0.003xD	
		Martensitic	820	240	13	60 - 165	0.002 - 0.007xD	0.003xD	
M	Stainless steel and cast steel	Austenitic	600	180	14	60 - 110	0.002 - 0.007xD	0.003xD	
K	Grey cast iron (GG)	Ferritic/pearlitic		180	15	150 - 275	0.005 - 0.01xD	0.006xD	
		Pearlitic		260	16	150 - 265	0.005 - 0.01xD	0.006xD	
	Cast iron nodular (GGG)	Ferritic		160	17	150 - 200	0.005 - 0.01xD	0.006xD	
		Pearlitic		250	18	90 - 150	0.004 - 0.009xD	0.005xD	
	Malleable cast iron	Ferritic		130	19	150 - 200	0.005 - 0.01xD	0.006xD	
		Pearlitic		230	20	90 - 150	0.004 - 0.009xD	0.005xD	
S	High temp. alloys	Fe based	Annealed		200	31	20 - 45	0.002 - 0.004xD	0.003xD
			Cured		280	32	20 - 35	0.002 - 0.004xD	0.003xD
		Ni or Co based	Annealed		250	33	20 - 35	0.002 - 0.004xD	0.003xD
			Cured		350	34	20 - 35	0.002 - 0.004xD	0.003xD
			Cast		320	35	60 - 90	0.002 - 0.004xD	0.003xD
	Titanium alloys	Pure	Rm = 400		36	60 - 90	0.002 - 0.004xD	0.003xD	
		Alpha+beta alloys cured	Rm = 1050		37	60 - 90	0.002 - 0.004xD	0.003xD	
H	Hardened steel	Hardened		55 HRC	38	40 - 80	0.001 - 0.003xD	0.002xD	
		Hardened		60 HRC	39				
	Chilled cast iron	Cast		400	40	40 - 80	0.001 - 0.003xD	0.002xD	
	Cast iron	Hardened		55 HRC	41	40 - 80	0.001 - 0.003xD	0.002xD	

⁽¹⁾ Based on ISO 513 and VDI 3323 Standards