

SHEARDRILL™

Speeds and Feeds

Material Group	Examples	Composition / Structure		Hardness BRN	Cutting Speed (SFM)	D = 0.125"	D = 0.250"	D = 0.375"	D = 0.500"	D = 0.625"	D = 0.750"
Unalloyed steel, cast steel, machining steel	1008, 1108, 1018, 10L18, 12L15, ASTM A426: Gr. CP1	C = 0.10 - 0.25	Annealed, Long Chipping	125	390	0.004"	0.005"	0.006"	0.008"	0.009"	0.012"
		C = 0.10 - 0.25	Annealed, Short Chipping	125	410	0.004"	0.005"	0.006"	0.009"	0.011"	0.013"
	1030, 1055, 1070, 1524, 1050, 1060, ASTM 352 Gr. LCA, ASTM 356 Gr. 1, 1536	C = 0.25 - 0.55	Annealed, Long Chipping	190	360	0.004"	0.005"	0.006"	0.009"	0.011"	0.013"
		C = 0.25 - 0.55	Annealed, Short Chipping	190	390	0.004"	0.006"	0.007"	0.009"	0.011"	0.014"
		C = 0.25 - 0.55	Tempered	250	300	0.004"	0.006"	0.007"	0.009"	0.011"	0.015"
		C = 0.25 - 0.80	Annealed	270	260	0.004"	0.006"	0.007"	0.009"	0.011"	0.015"
		C = 0.25 - 0.80	Tempered	300	260	0.004"	0.006"	0.007"	0.009"	0.011"	0.015"
Low-alloy steel, cast steel, machining steel	1330, 2515, 3140, 4130, 4140, 4320, 4340, 5140, 8620, 9315, 9840	Annealed		180	260	0.004"	0.006"	0.007"	0.009"	0.012"	0.015"
		Tempered		275	260	0.004"	0.006"	0.007"	0.009"	0.011"	0.014"
		Tempered		300	260	0.004"	0.005"	0.006"	0.008"	0.010"	0.013"
		Tempered		350	230	0.004"	0.006"	0.007"	0.009"	0.011"	0.013"
High-alloy steel, cast steel, high alloy tool steel	D2, M2, T15	Annealed		200	200	0.003"	0.004"	0.005"	0.006"	0.008"	0.010"
		Hardened and Tempered		325	160	0.002"	0.004"	0.004"	0.006"	0.008"	0.010"
Gray cast iron	ASTM A48 Cl. 25, ASE J431c: Gr.G3000, ASTM A48 Cl. 30	Pearlitic / Ferritic		180	540	0.006"	0.007"	0.009"	0.012"	0.014"	0.018"
		Pearlitic (Martensitic)		260	360	0.005"	0.006"	0.008"	0.010"	0.013"	0.016"
Ductile cast iron	ASTM A536 Gr. 60-40-18, SAE J434c: Gr.D5506	Ferritic		160	360	0.005"	0.006"	0.008"	0.010"	0.012"	0.015"
		Pearlitic		250	360	0.004"	0.005"	0.006"	0.007"	0.009"	0.012"
Malleable cast iron	ASTM A47 Gr.32510, SAE J158 Gr. M4504, M5003	Ferritic		130	430	0.005"	0.006"	0.007"	0.009"	0.012"	0.015"
		Pearlitic		230	430	0.004"	0.005"	0.006"	0.008"	0.010"	0.012"
Austenitic Stainless Steels	202, 303, 304, 316, 316L	Easy to Moderate Machining		200	180	0.003"	0.004"	0.005"	0.006"	0.008"	0.010"
Ferritic, Martensitic, and PH stainless steels	405, 410, 440C, 502, AM350, 17-4PH	Annealed		200	180	0.003"	0.004"	0.005"	0.006"	0.008"	0.010"
		Hardened and Tempered		325	160	0.002"	0.004"	0.004"	0.006"	0.008"	0.010"

SPEED AND FEED RATES FOR NON-COOLANT-THROUGH DRILLS SHOULD EACH BE REDUCED BY 20%

Better drilling productivity is obtained by knowing the properties of the workpiece material. The hardness, chip forming characteristics, and machining characteristics help to select optimal machining parameters. Contact Morse Cutting Tools for more information.

SPEEDS and FEEDS are suggested starting points and may be increased or decreased depending upon material and machining conditions. Start conservatively and increase until machining cycle is optimized.