

Feeds and Speeds for Drills, Reamers and Taps

MATERIAL	BRINELL HARDNESS (BHN)	DRILLS			REAMERS		TAPS — SPEED (SFM) THREADS PER INCH			
		SPEED (SFM)	POINT	FEED	SPEED (SFM)	FEED	3-7½	8-15	16-24	25-UP
Aluminum	99-101	200-250	118°	M	150-160	M	50	100	150	200
Aluminum bronze	170-187	60	118°	M	40-45	M	12	25	45	60
Bakelite	—	80	60°-90°	M	50-60	M	50	100	150	200
Brass	192-202	200-250	118°	H	150-160	H	50	100	150	200
Bronze, common	166-183	200-250	118°	H	150-160	H	40	80	100	150
Bronze, phosphor, 1/2 hard	187-202	175-180	118°	M	130-140	M	25	40	50	80
Bronze, phosphor, soft	149-163	200-250	118°	H	150-160	H	40	80	100	150
Cast iron, soft	126	140-150	90°	H	100-110	H	30	60	90	140
Cast iron, medium soft	196	80-110	118°	M	50-65	M	25	40	50	80
Cast iron, hard	293-302	45-50	118°	L	67-75	L	10	20	30	40
Cast iron, chilled*	402	15	150°	L	8-10	L	5	5	10	10
Cast steel	286-302	40-50*	118°	L	70-75	L	20	30	40	50
Celluloid	—	100	90°	M	75-80	M	50	100	150	200
Copper	80-85	70	100°	L	45-55	L	40	80	100	150
Drop forgings (steel)	170-196	60	118°	M	40-45	M	12	25	45	60
Duralumin	90-104	200	118°	M	150-160	M	50	100	150	200
Everdur	179-207	60	118°	L	40-45	L	20	30	40	50
Machinery steel	170-196	110	118°	H	67-75	H	35	50	60	85
Magnet steel, soft	241-302	35-40	118°	M	20-25	M	20	40	50	75
Magnet steel, hard*	321-512	15	150°	L	10	L	5	10	15	25
Manganese steel, 7-13*	187-217	15	150°	L	10	L	15	20	25	30
Manganese copper, 30 Mn.*	134	15	150°	L	10-12	L	—	—	—	—
Malleable iron	112-126	85-90	118°	H	—	H	20	30	40	50
Mild steel, .20-.30C	170-202	110-120	118°	H	75-85	H	40	55	70	90
Molybdenum steel	196-235	55	125°	M	35-45	M	20	30	35	45
Monel metal	149-170	50	118°	M	35-38	M	8	10	15	20
Nickel, pure*	187-202	75	118°	L	40	L	25	40	50	80
Nickel steel, 3½%	196-241	60	118°	L	40-45	L	8	10	15	20
Rubber, hard	—	100	60°-90°	L	70-80	L	50	100	150	200
Screw stock, C.R.	170-196	110	118°	H	75	H	20	30	40	50
Spring steel	402	20	150°	L	12-15	L	10	10	15	15
Stainless steel	146-149	50	118°	M	30	M	8	10	15	20
Stainless steel, C.R.*	460-477	20	118°	L	15	L	8	10	15	20
Steel, .40 to .50 C	170-196	80	118°	M	8-10	M	20	30	40	50
Tool, S.A.E., and Forging steel	149	75	118°	H	35-40	H	25	35	45	55
Tool, S.A.E., and Forging steel	241	50	125°	M	12	M	15	15	25	25
Tool, S.A.E., and Forging steel*	402	15	150°	L	10	L	8	10	15	20
Zinc alloy	112-126	200-250	118°	M	150-175	M	50	100	150	200

* Use specially constructed heavy duty drills.

REFERENCE SYMBOL	Drill Feed per Revolution (IPR)					Reamer Feed ALL DIAMETERS Use a feed equal to two or three times that recommended for Drills.
	DIAMETER OF DRILL					
	UNDER ⅛	⅛ to ¼	¼ to ½	½ to 1	OVER 1"	
L – Light	.001	.002	.003	.005	.006	
M – Medium	.0015	.003	.006	.010	.012	
H – Heavy	.0025	.005	.010	.020	.025	

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

TAP SPEEDS may be **increased** for coated taps, spiral point taps, fine pitch taps and when the percentage of thread is decreased.

TAP SPEEDS may need to be **reduced** for spiral flute taps, coarse pitch taps, bottoming taps, difficult materials, longer thread lengths and when the percentage of thread is increased.

PIPE TAPS speeds should be between one-half and three-quarters of the speeds of taps of comparable diameter and pitch.

THREAD FORMING TAPS generally form threads more efficiently at higher speeds. Suggested speeds are 50% to 100% higher than the suggested speeds for cutting taps in similar applications.