

TAPPING SPEED GUIDE

MATERIALS			SPEED FEET PER MINUTE	MATERIALS			SPEED FEET PER MINUTE
Aluminum Alloys			90-100	(Steel, Cont.) Carbon Steel, Plain	Annealed	40-80	
Brass			60-100		Tempered	15-40	
Bronze			40-60	Cast, Carbon	Annealed	40-50	
Copper			40-60		Tempered	30	
High Temperature Alloys	Cobalt Base		5-10	Cast, Corrosion Resistant, Heat Resistant, Low Alloy	Annealed	20-30	
	Iron Base		10-15		as Cast	20-25	
	Nickel Base		5-10		Annealed	30-45	
Iron	Ductile	Annealed	60	Precipitation Hardening, Stainless	Tempered	15-25	
		as Cast	30		Treated	10-15	
		Tempered	15-20		Annealed	15-45	
	Gray,	Annealed	80		Tempered	15-25	
		As Cast	35-60	Free Machining,	Annealed	45-75	
	Malleable		60	Tool Steels, High Speed	Annealed	15-25	
		Heat Treated	25-50	Water Hardening	Annealed	50	
Magnesium Alloys		Annealed	175	Ultra High Strength Steels	Annealed	35	
Manganese			20		Normalized	20	
Molybdenum Alloys		Stress Relieved	50		Tempered	3-7	
Monel		Annealed	20	Maraging Steels	Annealed	20-15	
Nickel Alloys		Annealed	25		Maraged	5-10	
Plastics,	Reinforced		25	Tantalum Alloys, Stress Relieved		3	
	Thermoplastics		50	Titanium Alloys, Commercial Pure,	Annealed	40-60	
	Thermosetting Plastics		50	Alpha & Alpha Beta Alloys,	Annealed	10-25	
Steels,	Alloys, Annealed or Cold Drawn		40-60	Tungsten Alloys, Pressed & Sintered		50	
	Quenched & Tempered		15-35	Zinc Alloys	Die Cast	150	
	Armor Plate		10				

CONVERSION TABLE, SURFACE FEET PER MINUTE TO REVOLUTIONS PER MINUTE

SPEED FEET PER MINUTE	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150
TAP SIZE	REVOLUTIONS PER MINUTE														
0	1273	1592	1910	2546	3183	3820	4456	5093	5730	6366	7003	7639	8276	8913	9549
1	1047	1308	1570	2093	2617	3140	3663	4186	4710	5233	5756	6279	6808	7326	7849
2	888	1110	1333	1777	2221	2665	3109	3554	3999	4442	4886	5330	5774	6218	6662
3	772	964	1157	1543	1929	2315	2701	3086	3472	3858	4244	4629	5015	5401	5787
4	682	853	1023	1364	1705	2046	2387	2728	3069	3411	3751	4092	4434	4775	5116
5	611	764	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
6	553	691	829	1106	1382	1658	1934	2211	2487	2764	3040	3316	3592	3869	4145
8	466	583	699	932	1165	1398	1631	1864	2097	2330	2563	2796	3029	3262	3495
10	401	502	603	804	1005	1205	1406	1607	1808	2009	2210	2411	2612	2813	3014
12	354	442	531	707	884	1061	1238	1415	1592	1769	1945	2122	2300	2476	2653
1/4	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292
5/16	245	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
3/8	204	255	306	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	175	219	262	349	437	524	611	698	786	873	960	1048	1135	1222	1310
1/2	153	191	229	306	382	458	535	611	688	764	840	917	993	1070	1146
9/16	137	172	206	275	344	412	481	550	619	687	756	825	893	963	1031
5/8	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917
3/4	102	128	153	203	255	306	357	407	458	509	560	611	662	713	764
7/8	87	109	131	175	218	262	306	350	392	437	480	524	568	611	655
1	76	96	115	153	191	230	268	306	344	382	420	458	497	535	573

METRIC POPULAR SPECIAL SPIRAL POINT TAPS

LIST 102MOS

Spiral Point Plug



STYLE 1 - M1.5 THROUGH M5		STYLE 2 - M6 THROUGH M10			STYLE 3 - M12 THROUGH M16	
TAP SIZE	PITCH DIA. LIMIT	NO. OF FLUTES	TAP BLANK SIZE	102MOS		
				SPPT PLUG EDP NUMBER		
M2X0.45	D1	2	#2	82052		
M2X0.45	D2	2	#2	82058		
M2X0.4	D1	2	#2	82038		
M2X0.4	D2	2	#2	82042		
M2.2X0.45	D1	2	#2	82062		
M2.3X0.4	D1	2	#3	82072		
M2.3X0.4	D2	2	#3	82078		
M2.5X0.45	D1	2	#3	82082		
M2.5X0.45	D2	2	#3	82088		
M2.6X0.45	D1	2	#3	82098		
M2.6X0.45	D2	2	#3	82102		
M3X0.6	D1	2	#5	82122		
M3X0.6	D2	2	#5	82128		
M3X0.5	D1	2	#5	82108		
M3X0.5	D2	2	#5	82112		
M3.5X0.6	D1	2	#6	82132		
M3.5X0.6	D2	2	#6	82138		
M4X0.75	D2	2	#8	82162		
M4X0.75	D3	2	#8	82168		
M4X0.7	D2	2	#8	82148		
M4X0.7	D3	2	#8	82152		
M4.5X0.75	D2	2	#10	82172		
M4.5X0.75	D3	2	#10	82178		
M5X1.0	D2	2	#10	82212		
M5X1.0	D3	2	#10	82218		
M5X0.9	D2	2	#10	82202		
M5X0.9	D3	2	#10	82208		
M5X0.8	D2	2	#10	82192		
M5X0.8	D3	2	#10	82194		
M5.5X0.9	D2	2	#12	82222		
M5.5X0.9	D3	2	#12	82228		
M6X1.0	D3	2	1/4"	82242		
M6X0.75	D2	2	1/4"	82232		
M6X0.75	D3	2	1/4"	82238		
M7X1.0	D3	2	5/16"	82262		
M7X0.75	D2	2	5/16"	82252		

METRIC POPULAR SPECIAL SPIRAL POINT TAPS (CONTINUED)

LIST 102MOS

Spiral Point Plug



STYLE 1 - M1.5 THROUGH M5		STYLE 2 - M6 THROUGH M10			STYLE 3 - M12 THROUGH M16	
TAP SIZE	PITCH DIA. LIMIT	NO. OF FLUTES	TAP BLANK SIZE	102MOS		
				SPPT PLUG EDP NUMBER		
M7X0.75	D4	2	5/16"	82258		
M8X1.25	D3	2	5/16"	82282		
M8X1.0	D3	2	5/16"	82272		
M8X1.0	D5	2	5/16"	82278		
M9X1.25	D3	3	3/8"	82302		
M9X1.25	D5	3	3/8"	82308		
M9X1.0	D3	3	3/8"	82292		
M9X1.0	D5	3	3/8"	82298		
M10X1.5	D3	3	3/8"	82332		
M10X1.5	D5	3	3/8"	82338		
M10X1.25	D3	3	3/8"	82322		
M10X1.25	D5	3	3/8"	82328		
M10X1.0	D3	3	3/8"	82312		
M10X1.0	D5	3	3/8"	82318		
M11X1.5	D3	3	7/16"	82348		
M11X1.5	D5	3	7/16"	82352		
M12X1.75	D3	3	1/2"	82378		
M12X1.75	D5	3	1/2"	82382		
M12X1.5	D3	3	1/2"	82368		
M12X1.5	D5	3	1/2"	82372		
M12X1.25	D3	3	1/2"	82358		
M12X1.25	D5	3	1/2"	82362		
M14X2.0	D3	3	9/16"	82412		
M14X2.0	D5	3	9/16"	82419		
M14X1.5	D3	3	9/16"	82402		
M14X1.5	D5	3	9/16"	82408		
M14X1.25	D5	3	9/16"	82398		
M15X1.5	D3	3	5/8"	82428		
M15X1.5	D5	3	5/8"	82432		
M16X2.0	D4	3	5/8"	82448		
M16X2.0	D6	3	5/8"	82452		
M16X1.5	D3	3	5/8"	8243		
M16X1.5	D5	3	5/8"	82442		

See page 89 for Tap Dimensions.



METRIC TAP DRILL SIZES AND PERCENTAGES OF THREADS

TAP SIZE	TAP DRILL	DECIMAL EQUIV.	THEOR. % OF THREAD	TAP SIZE	TAP DRILL	DECIMAL EQUIV.	THEOR. % OF THREAD	TAP SIZE	TAP DRILL	DECIMAL EQUIV.	THEOR. % OF THREAD
M1.6X3.5	1.25mm	.0492	77	M8X1.25	I	.2720	67	M22X1.5	20.5mm	.8071	77
	1.3mm	.0512	66	M8X1	7mm	.2756	77	M24X3	13/16	.8125	70
	#55	.0520	61		J	.2770	74		21mm	.8268	77
M1.8X.35	1.45mm	.0571	77	M10X1.5	8.5mm	.3346	77	M24X2	27/32	.8438	66
	1.5mm	.0591	66	M10X1.25	R	.3390	71		22mm	.8661	77
	#53	.0595	64		8.75mm	.3445	77	7/8	.8750	68	
M2X.4	1.6mm	.0630	77	M12X1.75	S	.3480	71	M27X3	24mm	.9449	77
	#52	.0635	74		13/32	.4062	74	61/64	.9531	72	
M2.2X.45	1.75mm	.0689	77	M12X1.25	Z	.4130	66	M27X2	25mm	.9843	77
	#50	.0700	72		27/64	.4219	79	63/64	.9844	77	
M2.5X.45	2.05mm	.0807	77	M14X2	11mm	.4331	62	M30X3.5	26.5mm	1.0433	77
	#45	.0820	71		12mm	.4724	77		1 1/16	1.0625	66
M3X.5	2.5mm	.0984	77	M14X1.5	31/64	.4844	65	M30X2	28mm	1.1024	77
	#39	.0995	73		12.5mm	.4921	77		1 7/64	1.1094	70
M3.5X.6	2.9mm	.1142	77	M16X2	1/2	.5000	67	M33X3.5	29.5mm	1.1614	77
	#32	.1160	71		14mm	.5512	77		1 11/64	1.1719	71
M4X.7	3.3mm	.1299	77	M16X1.5	9/16	.5625	66	M33X2	31mm	1.2205	77
	3.4mm	.1339	66		14.5mm	.5709	77		1 15/64	1.2344	63
	#29	.1360	60		37/64	.5781	68		32mm	1.2598	77
M4.5X.75	3.75mm	.1476	77	M18X2.5	15.5mm	.6102	77	M36X4	1 17/64	1.2656	74
	#25	.1495	72		5/8	.6250	65		1 19/64	1.2969	78
M5X.8	4.2mm	.1654	77	M18X1.5	16.5mm	.6496	77	M36X3	33mm	1.2992	77
	#18	.1695	67		21/32	.6562	68		1 5/16	1.3125	68
M6X1	5mm	.1969	77	M20X2.5	17.5mm	.6890	77	M39X4	1 3/8	1.3750	78
	#8	.1990	73		45/64	.7031	66		35mm	1.3780	77
M7X1	6mm	.2362	77	M20X1.5	18.5mm	.7283	77	M39X3	1 25/64	1.3906	71
	B	.2380	74		47/64	.7344	69		36mm	1.4173	77
M8X1.25	6.75mm	.2657	77	M22X2.5	19.5mm	.7677	77	1 27/64	1.4219	74	
	6.8mm	.2677	74		25/32	.7812	66				

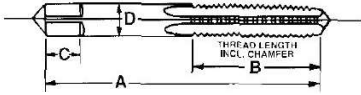
PIPE TAP DRILL SIZES

TAP SIZE	*NPT		*NPTF		STRAIGHT	
	TAP DRILL	DECIMAL EQUIV.	TAP DRILL	DECIMAL EQUIV.	TAP DRILL	DECIMAL EQUIV.
1/16	D	.2460	D	.2460	1/4	.2500
1/8	Q	.3320	R	.3390	11/32	.3438
1/4	7/16	.4375	7/16	.4375	7/16	.4375
3/8	9/16	.5625	37/64	.5781	37/64	.5781
1/2	45/64	.7031	45/64	.7031	23/32	.7188
3/4	29/32	.9062	59/64	.9219	59/64	.9219
1	1 9/64	1.1406	1 5/32	1.1562	1 5/32	1.1562
1 1/4	1 31/64	1.4844	1 1/2	1.5000	1 1/2	1.5000
1 1/2	1 47/64	1.7344	1 47/64	1.7344	1 3/4	1.7500
2	2 13/64	2.2031	2 7/32	2.2188	2 7/32	2.2188
2 1/2	2 5/8	2.6250	2 41/64	2.6406	2 21/32	2.6562
3			3 17/64	3.2656		

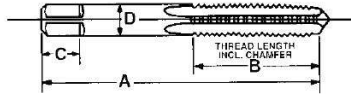
*For tapping without reaming.

STANDARD TAP DIMENSIONS, GROUND THREAD

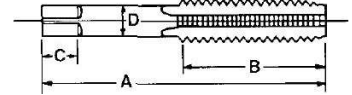
General Dimensions



STYLE 1



STYLE 2



STYLE 3

NOMINAL DIAMETER RANGE - INCHES		MACHINE SCREW SIZE NO.	NOMINAL FRACTIONAL DIAMETER INCHES	NOMINAL METRIC DIAMETER MILLIMETER	STYLE*	TAP DIMENSIONS - INCHES				
OVER	TO (INCL.)					O/A LENGTH A	THD. LGTH. B	SQ. LGTH. C	SHANK DIA. D	SIZE OF SQ. E
.052	.065	0	1/16	M1.6	1	1 5/8	5/16	3/16	.141	.110
.065	.078	1		M1.8	1	1 11/16	3/8	3/16	.141	.110
.078	.091	2		M2, M2.2	1	1 3/4	7/16	3/16	.141	.110
.091	.104	3	3/32	M2.5	1	1 13/16	1/2	3/16	.141	.110
.104	.117	4			1	1 7/8	9/16	3/16	.141	.110
.117	.130	5	1/8	M3, M3.15	1	1 15/16	5/8	3/16	.141	.110
.130	.145	6		M3.5	1	2	11/16	3/16	.141	.110
.145	.171	8	5/32	M4	1	2 1/8	3/4	1/4	.168	.131
.171	.197	10	3/16	M4.5, M5	1	2 3/8	7/8	1/4	.194	.152
.197	.223	12	7/32		1	2 3/8	15/16	9/32	.220	.165
.223	.260	14	1/4	M6, M6.3	2	2 1/2	1	5/16	.255	.191
.260	.323		5/16	M7, M8	2	2 23/32	1 1/8	3/8	.318	.238
.323	.395		3/8	M10	2	2 15/16	1 1/4	7/16	.381	.286
.395	.448		7/16		3	3 5/32	1 7/16	13/32	.323	.242
.448	.510		1/2	M12, M12.5	3	3 3/8	1 21/32	7/16	.367	.275
.510	.573		9/16	M14	3	3 19/32	1 21/32	1/2	.429	.322
.573	.635		5/8	M16	3	3 13/16	1 13/16	9/16	.480	.360
.635	.709		11/16	M18	3	4 1/32	1 13/16	5/8	.542	.406
.709	.760		3/4		3	4 1/4	2	11/16	.590	.442
.760	.823		13/16	M20	3	4 15/32	2	11/16	.652	.489
.823	.885		7/8	M22	3	4 11/16	2 7/32	3/4	.697	.523
.885	.948		15/16	M24	3	4 29/32	2 7/32	3/4	.760	.570
.948	1.010		1	M25	3	5 1/8	2 1/2	13/16	.800	.600
1.010	1.073		1 1/16	M27	3	5 1/8	2 1/2	7/8	.896	.672
1.073	1.135		1 1/8		3	5 7/16	2 9/16	7/8	.896	.672
1.135	1.198		1 3/16	M30	3	5 7/16	2 9/16	1	1.021	.766
1.198	1.260		1 1/4		3	5 3/4	2 9/16	1	1.021	.766
1.260	1.323		1 5/16	M33	3	5 3/4	2 9/16	1 1/16	1.108	.831
1.323	1.385		1 3/8		3	6 1/16	3	1 1/16	1.108	.831
1.385	1.448		1 7/16	M36	3	6 1/16	3	1 1/8	1.233	.925
1.448	1.510		1 1/2		3	6 3/8	3	1 1/8	1.233	.925
1.510	1.635		1 5/8	M39	3	6 11/16	3 3/16	1 1/8	1.305	.979
1.635	1.760		1 3/4	M42	3	7	3 3/16	1 1/4	1.430	1.072
1.760	1.885		1 7/8		3	7 5/16	3 9/16	1 1/4	1.519	1.139
1.885	2.010		2	M48	3	7 5/8	3 9/16	1 3/8	1.644	1.233
2.010	2.135		2 1/8		3	8	3 9/16	1 3/8	1.769	1.327
2.135	2.260		2 1/4	M56	3	8 1/4	3 9/16	1 7/16	1.894	1.420
2.260	2.385		2 3/8		3	8 1/2	4	1 7/16	2.019	1.514
2.385	2.510		2 1/2		3	8 3/4	4	1 1/2	2.100	1.575
2.510	2.635		2 5/8	M64	3	8 3/4	4	1 1/2	2.225	1.669
2.635	2.760		2 3/4		3	9 1/4	4	1 9/16	2.350	1.762
2.760	2.885		2 7/8	M72	3	9 1/4	4	1 9/16	2.475	1.856
2.885	3.010		3		3	9 3/4	4 9/16	1 5/8	2.543	1.907
3.010	3.135		3 1/8		3	9 3/4	4 9/16	1 5/8	2.668	2.001
3.135	3.260		3 1/4	M80	3	10	4 9/16	1 3/4	2.793	2.095

*Styles shown are for Ground Thread Taps.