

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	Cast, Corrosion Resistant,	Annealed	20-30	
					Iron Base	as Cast	20-25
					Nickel Base	Low Alloy	Annealed
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		Annealed	45-75	
	Malleable		60		Tool Steels, High Speed	Annealed	15-25
Magnesium Alloys		Heat Treated	25-50	Water Hardening	Annealed	50	
		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	
	Alloys, Annealed or Cold Drawn		40-60	Tungsten Alloys, Pressed & Sintered		50	
Steels,	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

HAND TAPS MACHINE SCREW SIZES

LIST 106A

Taper
 Plug
 Bottom



TAP SIZE	SERIES DESIG.	NO. OF FLUTES	H LIMIT	106A			
				TAPER EDP NUMBER	PLUG EDP NUMBER	BOTTOM EDP NUMBER	SET EDP NUMBER
0 - 80	NF	2	H-1	10011	10012	10013	10010
0 - 80	NF	2	H-2	10021	10022	10023	10020
1 - 64	NC	2	H-1	10111	10112	10113	10110
1 - 64	NC	2	H-2	10121	10122	10123	10120
1 - 72	NF	2	H-1	10211	10212	10213	10210
1 - 72	NF	2	H-2	10221	10222	10223	10220
2 - 56	NC	2	H-1	10311	10312	10313	10310
2 - 56	NC	2	H-2	10321	10322	10323	10320
2 - 56	NC	3	H-1	10411	10412	10413	10410
2 - 56	NC	3	H-2	10421	10422	10423	10420
2 - 64	NF	2	H-1	10511	10512	10513	10510
2 - 64	NF	2	H-2	10521	10522	10523	10520
2 - 64	NF	3	H-1	10611	10612	10613	10610
2 - 64	NF	3	H-2	10621	10622	10623	10620
3 - 48	NC	2	H-1	10711	10712	10713	10710
3 - 48	NC	2	H-2	10721	10722	10723	10720
3 - 48	NC	3	H-1	10811	10812	10813	10810
3 - 48	NC	3	H-2	10821	10822	10823	10820
3 - 56	NF	2	H-1	10911	10912	10913	10910
3 - 56	NF	2	H-2	10921	10922	10923	10920
3 - 56	NF	3	H-1	11011	11012	11013	11010
3 - 56	NF	3	H-2	11021	11022	11023	11020
4 - 40	NC	2	H-1	11311	11312	11313	11310
4 - 40	NC	2	H-2	11321	11322	11323	11320
4 - 40	NC	3	H-1	11411	11412	11413	11410
4 - 40	NC	3	H-2	11421	11422	11423	11420
4 - 48	NF	2	H-1	11511	11512	11513	11510
4 - 48	NF	2	H-2	11521	11522	11523	11520
4 - 48	NF	3	H-1	11611	11612	11613	11610
4 - 48	NF	3	H-2	11621	11622	11623	11620
4 - 36	NS	2	H-1	11111	11112	11113	11110
4 - 36	NS	2	H-2	11121	11122	11123	11120
4 - 36	NS	3	H-1	11211	11212	11213	11210
4 - 36	NS	3	H-2	11221	11222	11223	11220
5 - 40	NC	2	H-1	11711	11712	11713	11710
5 - 40	NC	2	H-2	11721	11722	11723	11720

See page 87 for Tap Recommendations for Classes 2B & 3B.
 See page 89 for Tap Dimensions.

HAND TAPS MACHINE SCREW SIZES (CONTINUED)

LIST 106A

Taper
Plug
Bottom



TAP SIZE	SERIES DESIG.	NO. OF FLUTES	H LIMIT	106A			
				TAPER EDP NUMBER	PLUG EDP NUMBER	BOTTOM EDP NUMBER	SET EDP NUMBER
5 - 40	NC	3	H-1	11811	11812	11813	11810
5 - 40	NC	3	H-2	11821	11822	11823	11820
5 - 44	NF	2	H-1	11911	11912	11913	11910
5 - 44	NF	2	H-2	11921	11922	11923	11920
5 - 44	NF	3	H-1	12011	12012	12013	12010
5 - 44	NF	3	H-2	12021	12022	12023	12020
6 - 32	NC	2	H-1	12111	12112	12113	12110
6 - 32	NC	2	H-2	12121	12122	12123	12120
6 - 32	NC	2	H-3	12131	12132	12133	12130
6 - 32	NC	3	H-1	12211	12212	12213	12210
6 - 32	NC	3	H-2	12221	12222	12223	12220
6 - 32	NC	3	H-3	12231	12232	12233	12230
6 - 40	NF	2	H-1	12311	12312	12313	12310
6 - 40	NF	2	H-2	12321	12322	12323	12320
6 - 40	NF	3	H-1	12411	12412	12413	12410
6 - 40	NF	3	H-2	12421	12422	12423	12420
8 - 32	NC	2	H-1	12511	12512	12513	12510
8 - 32	NC	2	H-2	12521	12522	12523	12520
8 - 32	NC	2	H-3	12531	12532	12533	12530
8 - 32	NC	3	H-1	12611	12612	12613	12610
8 - 32	NC	3	H-2	12621	12622	12623	12620
8 - 32	NC	3	H-3	12631	12632	12633	12630
8 - 32	NC	4	H-1	12711	12712	12713	12710
8 - 32	NC	4	H-2	12721	12722	12723	12720
8 - 32	NC	4	H-3	12731	12732	12733	12730
8 - 36	NF	2	H-1	12811	12812	12813	12810
8 - 36	NF	2	H-2	12821	12822	12823	12820
8 - 36	NF	3	H-1	12911	12912	12913	12910
8 - 36	NF	3	H-2	12921	12922	12923	12920
8 - 36	NF	4	H-1	13011	13012	13013	13010
8 - 36	NF	4	H-2	13021	13022	13023	13020
10 - 24	NC	2	H-1	13111	13112	13113	13110
10 - 24	NC	2	H-2	13121	13122	13123	13120
10 - 24	NC	2	H-3	13131	13132	13133	13130
10 - 24	NC	3	H-1	13211	13212	13213	13210
10 - 24	NC	3	H-2	13221	13222	13223	13220

HAND TAPS MACHINE SCREW SIZES (CONTINUED)

LIST 106A

Taper
 Plug
 Bottom



TAP SIZE	SERIES DESIG.	NO. OF FLUTES	H LIMIT	106A			
				TAPER EDP NUMBER	PLUG EDP NUMBER	BOTTOM EDP NUMBER	SET EDP NUMBER
10 - 24	NC	3	H-3	13231	13232	13233	13230
10 - 24	NC	4	H-1	13311	13312	13313	13310
10 - 24	NC	4	H-2	13321	13322	13323	13320
10 - 24	NC	4	H-3	13331	13332	13333	13330
10 - 32	NF	2	H-1	13411	13412	13413	13410
10 - 32	NF	2	H-2	13421	13422	13423	13420
10 - 32	NF	2	H-3	13431	13432	13433	13430
10 - 32	NF	3	H-1	13511	13512	13513	13510
10 - 32	NF	3	H-2	13521	13522	13523	13520
10 - 32	NF	3	H-3	13531	13532	13533	13530
10 - 32	NF	4	H-1	13611	13612	13613	13610
10 - 32	NF	4	H-2	13621	13622	13623	13620
10 - 32	NF	4	H-3	13631	13632	13633	13630
12 - 24	NC	4	H-1	13711	13712	13713	13710
12 - 24	NC	4	H-3	13731	13732	13733	13730
12 - 28	NF	4	H-1	13811	13812	13813	13810
12 - 28	NF	4	H-3	13831	13832	13833	13830
14 - 20	NS	4	H-3	13931	13932	13933	13930
14 - 24	NS	4	H-3	14031	14032	14033	14030

Penta Relief – Special thread geometry that allows for freer cutting. Available in Standard Taps in List Numbers 106A in size #10 with 2 & 3 Flutes and larger sizes, 103, 102C, 402VPR, 402VMR, 403V, 403VM, 407VPR and 407VMR.

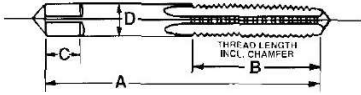


TAP DRILL SIZES AND PERCENTAGE OF THREADS

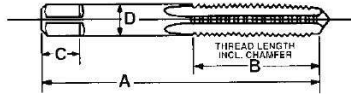
TAP		TAP DRILL	DECIM. EQUIV.	THEOR. % OF THREAD	TAP		TAP DRILL	DECIM. EQUIV.	THEOR. % OF THREAD	TAP		TAP DRILL	DECIM. EQUIV.	THEOR. % OF THREAD
NOM. SIZE	TPI				NOM. SIZE	TPI				NOM. SIZE	TPI			
0	80	#56	.0465	83	1/4	20	13/64	.2031	72	5/8	18	9/16	.5625	87
		3/64	.0469	81			#6	.2040	71			0.5687	.5687	78
1	64	#54	.0550	89	1/4	28	#5	.2055	69	5/8	20	37/64	.5781	72
		#53	.0595	67			#3	.2130	80			37/64	.5781	87
1	72	#53	.0595	75	1/4	32	7/32	.2188	67	5/8	24	0.5828	.5828	78
		1/16	.0625	58			7/32	.2188	77			5/8	28	19/32
2	56	#51	.0670	82	1/4	36	#2	.2210	71	5/8	32	19/32	.5938	77
		#50	.0700	69			#2	.2210	80			19/32	.5938	87
2	64	#49	.0730	56	5/16	18	F	.2570	77	11/16	12	39/64	.6094	72
		#50	.0700	79			G	.2610	71			5/8	16	.6250
3	48	#48	.0760	85	5/16	20	F	.2570	85	11/16	20	41/64	.6406	72
		5/64	.0781	77			G	.2610	79			11/16	24	41/64
3	56	#47	.0785	76	5/16	24	H	.2660	72	11/16	28	21/32	.6562	67
		#46	.0810	67			H	.2660	86			11/16	32	21/32
3	40	#45	.0820	63	5/16	28	I	.2720	75	3/4	10	41/64	.6406	84
		#48	.0810	78			J	.2770	66			21/32	.6562	72
4	40	#44	.0860	80	5/16	32	J	.2770	77	3/4	12	21/32	.6562	87
		#43	.0890	71			K	.2810	68			43/64	.6719	72
4	48	#42	.0935	57	5/16	36	9/32	.2812	67	3/4	16	11/16	.6875	77
		3/32	.0938	56			K	.2810	78			3/4	20	45/64
4	48	#43	.0890	85	3/8	16	7.25mm	.2854	75	3/4	28	23/32	.7188	67
		#42	.0935	68			5/16	.3125	77			3/4	32	23/32
5	40	#41	.0960	59	3/8	20	O	.3160	73	13/16	12	47/64	.7344	72
		#40	.0980	83			P	.3230	80			13/16	16	3/4
5	44	#39	.0995	79	3/8	24	Q	.3320	66	13/16	20	49/64	.7656	72
		#38	.1015	72			Q	.3320	79			13/16	28	25/32
5	32	#37	.1040	65	3/8	28	R	.3390	67	13/16	32	25/32	.7812	77
		#38	.1015	80			11/32	.3438	67			7/8	9	49/64
6	40	#37	.1040	71	3/8	32	11/32	.3438	77	7/8	12	25/32	.7812	87
		#36	.1065	63			11/32	.3438	67			7/8	14	51/64
6	48	#37	.1040	84	3/8	36	S	.3480	75	7/8	14	0.8024	.8024	78
		#36	.1065	78			S	.3480	75			13/16	12	.8125
6	40	7/64	.1094	70	7/16	14	T	.3580	86	7/8	16	13/16	.8125	77
		#35	.1100	69			23/64	.3594	84			7/8	20	53/64
6	48	#34	.1110	67	7/16	16	3/8	.3750	77	7/8	28	27/32	.8438	67
		#33	.1130	77			V	.3770	75			7/8	32	27/32
8	32	#34	.1110	83	7/16	20	W	.3860	79	15/16	12	27/32	.8438	87
		#33	.1130	77			25/64	.3906	72			7/8	28	27/32
8	36	#32	.1160	68	7/16	28	Y	.4040	72	15/16	16	55/64	.8594	72
		#29	.1360	69			Y	.4040	83			15/16	20	57/64
8	48	#29	.1360	78	1/2	12	13/32	.4062	77	15/16	28	7/8	.8750	77
		#28	.1405	65			Z	.4130	80			15/16	32	29/32
10	24	9/64	.1406	65	1/2	13	27/64	.4219	72	15/16	32	29/32	.9062	77
		#27	.1440	85			27/64	.4219	78			1	8	55/64
10	32	#26	.1470	79	1/2	16	7/16	.4375	77	1	12	7/8	.8750	77
		#25	.1495	75			1/2	20	29/64			.4531	72	1
10	40	#24	.1520	70	1/2	28	15/32	.4688	67	1	20	29/32	.9062	87
		#23	.1540	66			15/32	.4688	77			1	28	31/32
10	48	5/32	.1562	83	9/16	12	15/32	.4688	87	1	32	31/32	.9688	77
		#22	.1570	81			31/64	.4844	72			1	16	15/16
12	24	#21	.1590	76	9/16	16	1/2	.5000	77	1	16	0.9274	.9274	78
		#20	.1610	71			0.5062	.5062	69			1	20	61/64
12	28	#17	.1730	79	9/16	18	1/2	.5000	87	1	28	31/32	.9688	67
		#16	.1770	72			0.5062	.5062	78			1	32	31/32
12	32	#15	.1800	67	9/16	20	33/64	.5156	72	1 1/16	8	59/64	.9219	87
		#16	.1770	84			33/64	.5156	87			0.9274	.9274	83
12	36	#15	.1800	78	9/16	24	0.5203	.5203	78	1 1/16	12	15/16	.9375	77
		#14	.1820	73			17/32	.5312	67			31/32	.9688	87
12	40	#13	.1850	67	9/16	28	0.5263	.5263	78	1 1/16	16	63/64	.9844	72
		#14	.1820	84			17/32	.5312	77			1	18	1.0000
1/4	20	#13	.1850	76	5/8	11	17/32	.5312	79	1 1/16	20	11/64	1.0156	72
		3/16	.1875	70			5/8	12	35/64			.5469	72	1
1/4	24	#12	.1890	67	5/8	16	9/16	.5625	77	1 1/16	20	11/64	1.0156	72
		#9	.1960	83			0.5687	.5687	69			1	1.0000	77
1/4	28	#8	.1990	79	5/8	16	9/16	.5625	77	1 1/16	20	11/64	1.0156	72
		#7	.2010	75			0.5687	.5687	69			1	1.0000	77

STANDARD TAP DIMENSIONS, GROUND THREAD

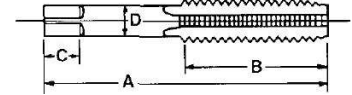
General Dimensions



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				
						O/A LENGTH A	THD. LGTH. B	SQ. LGTH. C	SHANK DIA. D	SIZE OF SQ. E
OVER	TO (INCL.)									
.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.