

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

NATIONAL EXTRA FINE PITCH (NEF) HAND TAPS

LIST 116

Taper
 Plug
 Bottom



TAP SIZE	H LIMIT	NO. OF FLUTES	116		
			TAPER EDP NUMBER	PLUG EDP NUMBER	BOTTOM EDP NUMBER
12 - 32	H-3	4	83001	83002	83003
1/4 - 32	H-3	4	83007	83008	83009
1/4 - 32	H-5	4	84007	84008	84009
5/16 - 32	H-3	4	83011	83012	83013
5/16 - 32	H-5	4	84011	84012	84013
3/8 - 32	H-3	4	83017	83018	83019
3/8 - 32	H-5	4	84017	84018	84019
7/16 - 28	H-3	4	83021	83022	83023
7/16 - 28	H-5	4	84021	84022	84023
1/2 - 28	H-3	4	83027	83028	83029
1/2 - 28	H-5	4	84027	84028	84029
9/16 - 24	H-3	4	83031	83032	83033
9/16 - 24	H-5	4	84031	84032	84033
5/8 - 24	H-3	6	83037	83038	83039
5/8 - 24	H-5	6	84037	84038	84039
11/16 - 24	H-3	6	83041	83042	83043
11/16 - 24	H-5	6	84041	84042	84043
3/4 - 20	H-3	6	83047	83048	83049
3/4 - 20	H-5	6	84047	84048	84049
13/16 - 20	H-3	6	83051	83052	83053
13/16 - 20	H-5	6	84051	84052	84053
7/8 - 20	H-3	6	83057	83058	83059
7/8 - 20	H-5	6	84057	84058	84059
15/16 - 20	H-3	6	83061	83062	83063
15/16 - 20	H-5	6	84061	84062	84063
1 - 20	H-3	6	83067	83068	83069
1 - 20	H-5	6	84067	84068	84069
1 1/16 - 18	H-4	6	83071	83072	83073
1 1/16 - 18	H-3	6	84071	84072	84073
1 1/16 - 18	H-6	6	84271	84272	84273
1 1/8 - 18	H-4	6	83077	83078	83079
1 1/8 - 18	H-3	6	84077	84078	84079
1 1/8 - 18	H-6	6	84277	84278	84279
1 3/16 - 18	H-4	6	83081	83082	83083
1 3/16 - 18	H-3	6	84081	84082	84083
1 3/16 - 18	H-6	6	84281	84282	84283
1 1/4 - 18	H-4	6	83087	83088	83089
1 1/4 - 18	H-3	6	84087	84088	84089
1 1/4 - 18	H-6	6	84287	84288	84289
1 5/16 - 18	H-4	6	83091	83092	83093
1 5/16 - 18	H-3	6	84091	84092	84093

NOTE: Consult factory for larger quantities.

NATIONAL EXTRA FINE PITCH (NEF) HAND TAPS (CONTINUED)

LIST 116

Taper
Plug
Bottom



TAP SIZE	H LIMIT	NO. OF FLUTES	116		
			TAPER EDP NUMBER	PLUG EDP NUMBER	BOTTOM EDP NUMBER
1 5/16 - 18	H-6	6	84291	84292	84293
1 3/8 - 18	H-4	6	83097	83098	83099
1 3/8 - 18	H-3	6	84097	84098	84099
1 3/8 - 18	H-6	6	84297	84298	84299
1 7/16 - 18	H-4	6	83101	83102	83103
1 7/16 - 18	H-3	6	84101	84102	84103
1 7/16 - 18	H-6	6	84301	84302	84303
1 1/2 - 18	H-4	6	83107	83108	83109
1 1/2 - 18	H-3	6	84107	84108	84109
1 1/2 - 18	H-6	6	84307	84308	84309

See page 89 for Tap Dimensions.

QUALITY TAPS SINCE 1912
www.rntap.com

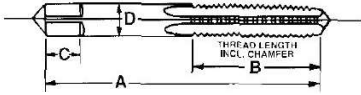


TAP DRILL SIZES AND PERCENTAGE OF THREADS

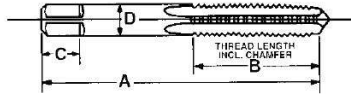
TAP		TAP DRILL	DECIM. EQUIV.	THEOR. % OF THREAD	TAP		TAP DRILL	DECIM. EQUIV.	THEOR. % OF THREAD	TAP		TAP DRILL	DECIM. EQUIV.	THEOR. % OF THREAD
NOM. SIZE	TPI				NOM. SIZE	TPI				NOM. SIZE	TPI			
0	80	#56	.0465	83	1/4	20	13/64	.2031	72	5/8	18	9/16	.5625	87
		3/64	.0469	81			#6	.2040	71			0.5687	.5687	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	9/32	.2812	77	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	77			7/8	14	51/64
6	48	#37	.1040	84	3/8	36	S	.3480	75	7/8	14	51/64	.7969	84
		#36	.1065	78			T	.3580	86			0.8024	.8024	78
6	40	7/64	.1094	70	7/16	14	23/64	.3594	84	7/8	16	13/16	.8125	77
		#35	.1100	69			3/8	.3750	77			7/8	20	53/64
6	48	#34	.1110	67	7/16	16	V	.3770	75	7/8	28	27/32	.8438	67
		#33	.1130	77			W	.3860	79			7/8	32	27/32
8	32	#32	.1160	68	7/16	28	25/64	.3906	72	15/16	12	27/32	.8438	87
		#29	.1360	69			Y	.4040	72			27/32	.8438	87
8	36	#29	.1360	78	7/16	32	Y	.4040	83	15/16	16	55/64	.8594	72
		#28	.1405	65			13/32	.4062	77			7/8	.8750	77
10	24	9/64	.1406	65	1/2	12	Z	.4130	80	15/16	20	57/64	.8906	72
		#27	.1440	85			27/64	.4219	72			15/16	28	29/32
10	24	#26	.1470	79	1/2	13	27/64	.4219	78	15/16	32	29/32	.9062	77
		#25	.1495	75			7/16	.4375	77			1	8	55/64
10	32	#24	.1520	70	1/2	16	29/64	.4531	72	1	12	7/8	.8750	77
		#23	.1540	66			15/32	.4688	67			29/32	.9062	87
10	32	5/32	.1562	83	1/2	32	15/32	.4688	77	1	14	59/64	.9219	72
		#22	.1570	81			15/32	.4688	87			59/64	.9219	84
12	24	#21	.1590	76	9/16	12	31/64	.4844	72	1	16	0.9274	.9274	78
		#20	.1610	71			1/2	.5000	77			15/16	.9375	77
12	28	11/64	.1719	82	9/16	18	0.5062	.5062	69	1	20	61/64	.9531	72
		#17	.1730	79			1/2	.5000	87			1	28	31/32
12	28	#16	.1770	84	9/16	20	0.5062	.5062	78	1	32	31/32	.9688	77
		#15	.1800	67			33/64	.5156	72			59/64	.9219	87
12	32	#16	.1770	84	9/16	24	33/64	.5156	87	1 1/16	8	0.9274	.9274	83
		#15	.1800	78			0.5203	.5203	78			15/16	.9375	77
12	32	#14	.1820	73	9/16	28	17/32	.5312	67	1 1/16	12	31/32	.9688	87
		#13	.1850	67			0.5263	.5263	78			63/64	.9844	72
1/4	20	#14	.1820	84	9/16	32	17/32	.5312	77	1 1/16	16	1	1.0000	77
		#13	.1850	76			17/32	.5312	77			1 1/16	18	1
1/4	20	#12	.1890	67	5/8	11	17/32	.5312	79	1 1/16	20	11/64	1.0156	72
		#9	.1960	83			5/8	12	35/64			.5469	72	
1/4	20	#8	.1990	79	5/8	16	9/16	.5625	77					
		#7	.2010	75			0.5687	.5687	69					

STANDARD TAP DIMENSIONS, GROUND THREAD

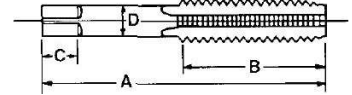
General Dimensions



STYLE 1



STYLE 2

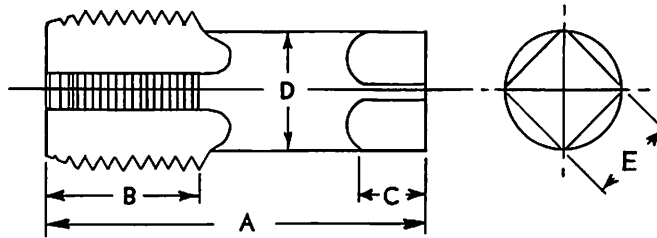


STYLE 3

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.

Table 26
Special Fine Pitch Hand Taps
(Short Series)



Unless otherwise specified, orders covering special hand taps 1 1/16" to 1 1/2" diameter inclusive having 14 or more threads per inch, and sizes over 1 1/2" diameter with 10 or more threads per inch, will be filled with taps having general dimensions as shown in the following table:

GENERAL DIMENSIONS

Diameter of Tap Inches	DIMENSIONS—INCHES				
	Length Overall A	Length of Full Thread B	Length of Square C	Diameter of Shank D	Size of Square E
1 1/16 & 1 1/8	4	1 1/2	3/8	.896	.672
1 3/16 & 1 1/4	4	1 1/2	1	1.021	.766
1 5/16 & 1 3/8	4	1 1/2	1	1.108	.831
1 7/16 & 1 1/2	4	1 1/2	1	1.233	.925
1 9/16	5	2	1 1/8	1.305	.979
1 5/8	5	2	1 1/4	1.430	1.072
1 3/4	5	2	1 1/4	1.519	1.139
2	5	2	1 3/8	1.644	1.233
2 1/8	5 1/4	2	1 3/8	1.769	1.327
2 1/4	5 1/4	2	1 3/8	1.894	1.420
2 3/8	5 1/4	2	1 3/8	2.019	1.514
2 1/2	5 1/4	2	1 1/2	2.100	1.575
2 5/8	5 1/2	2	1 1/2	2.100	1.575
2 3/4	5 1/2	2	1 1/2	2.100	1.575
2 7/8	5 1/2	2	1 1/2	2.100	1.575
3	5 1/2	2	1 1/2	2.100	1.575
3 1/8	5 3/4	2	1 1/2	2.100	1.575
3 1/4	5 3/4	2	1 1/2	2.100	1.575
3 3/8	5 3/4	2	1 1/2	2.100	1.575
3 1/2	5 3/4	2	1 1/2	2.100	1.575
3 5/8	6	2	1 3/4	2.100	1.575
3 3/4	6	2	1 3/4	2.100	1.575
3 7/8	6	2	1 3/4	2.100	1.575
4	6	2	1 3/4	2.100	1.575

NOTES

For standard thread limits and tolerances see Table 23.