

# DRILL & TAP REFERENCE DATA (INCH)

Unified American National Screws

Drill & Tap Reference Data

SCREW SIZE		NUMBER OF THREADS PER INCH	TAP DRILL		CLEARANCE HOLE DRILL			
NUMBER	DECIMAL		DR. SIZE	DECIMAL	CLOSE FIT		FREE FIT	
					DR. SIZE	DECIMAL	DR. SIZE	DECIMAL
#000	.034	120	#71	.026	#63	.037	#57	.0430
#00	.047	96	#62	.038	#55	.052	#53	.0595
#0	.060	80	#56	.0465	#52	.0635	#50	.0700
#1	.073	64	#53	.0595	#48	.0760	#46	.0810
#1	.073	72	#53	.0595	#48	.0760	#46	.0810
#2	.086	56	#50	.0700	#43	.0890	#41	.0960
#2	.086	64	#50	.0700	#43	.0890	#41	.0960
#3	.099	48	#47	.0785	#37	.1040	#35	.1100
#3	.099	56	#45	.0820	#37	.1040	#35	.1100
#4	.112	40	#43	.0890	#32	.1160	#30	.1285
#4	.112	48	#42	.0935	#32	.1160	#30	.1285
#5	.125	40	#38	.1015	#30	.1285	#29	.1360
#5	.125	44	#37	.1040	#30	.1285	#29	.1360
#6	.138	32	#36	.1065	#27	.1440	#25	.1495
#6	.138	40	#33	.1130	#27	.1440	#25	.1495
#8	.164	32	#29	.1360	#18	.1695	#16	.1770
#8	.164	36	#29	.1360	#18	.1695	#16	.1770
#10	.190	24	#25	.1495	#9	.1960	#7	.2010
#10	.190	32	#21	.1590	#9	.1960	#7	.2010
#12	.216	24	#16	.1770	#2	.2210	I	.2280
#12	.216	28	#14	.1820	#2	.2210	I	.2280
1/4	.250	20	#7	.2010	F	.2570	H	.2660
1/4	.250	28	#3	.2130	F	.2570	H	.2660
5/16	.3125	18	F	.2570	P	.3230	Q	.3320
5/16	.3125	24	I	.2720	P	.3230	Q	.3320
3/8	.375	16	5/16	.3125	W	.3860	X	.3970
3/8	.375	24	Q	.3320	W	.3860	X	.3970
7/16	.4375	14	U	.3680	29/64	.4531	15/32	.4687
7/16	.4375	20	25/64	.3906	29/64	.4531	15/32	.4687
1/2	.500	13	27/64	.4219	33/64	.5156	17/32	.5312
1/2	.500	20	29/64	.4531	33/64	.5156	17/32	.5312

NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE
#1	.2280	#17	.1730	#33	.1130	#49	.0730	#65	.0350	A	.234
#2	.2210	#18	.1695	#34	.1110	#50	.0700	#66	.0330	B	.238
#3	.2130	#19	.1660	#35	.1100	#51	.0670	#67	.0320	C	.242
#4	.2090	#20	.1610	#36	.1065	#52	.0635	#68	.0310	D	.246
#5	.2055	#21	.1590	#37	.1040	#53	.0595	#69	.0295	E	.250
#6	.2040	#22	.1570	#38	.1015	#54	.0550	#70	.0280	F	.257
#7	.2010	#23	.1540	#39	.0995	#55	.0520	#71	.0260	G	.261
#8	.1990	#24	.1520	#40	.0980	#56	.0465	#72	.0250	H	.266
#9	.1960	#25	.1495	#41	.0960	#57	.0430	#73	.0240	I	.272
#10	.1935	#26	.1470	#42	.0935	#58	.0420	#74	.0225	J	.277
#11	.1910	#27	.1440	#43	.0890	#59	.0410	#75	.0210	K	.281
#12	.1890	#28	.1405	#44	.0860	#60	.0400	#76	.0200	L	.290
#13	.1850	#29	.1360	#45	.0820	#61	.0390	#77	.0180	M	.295
#14	.1820	#30	.1285	#46	.0810	#62	.0380	#78	.0160	N	.302
#15	.1800	#31	.1200	#47	.0785	#63	.0370	#79	.0145	O	.316
#16	.1770	#32	.1160	#48	.0760	#64	.0360	#80	.0135	P	.323

# DRILL & TAP REFERENCE DATA (METRIC)

DRILL AND TAP REFERENCE DATA						
MAJOR THREAD DIAMETER	PITCH		TAP DRILL	CLEARANCE HOLE		
	COARSE	FINE	DIAMETER	TIGHT	NORMAL	LOOSE
1.60	0.35	0.20	1.25	1.7	1.8	2.0
2.00	0.40	0.25	1.60	2.2	2.4	2.6
2.50	0.45	0.35	2.05	2.7	2.9	3.1
3.00	0.50	0.35	2.50	3.2	3.4	3.6
3.50	0.60	0.35	2.09	3.7	3.9	4.2
4.00	0.70	0.50	3.30	4.3	4.5	4.8
5.00	0.80	0.50	4.20	5.3	5.5	5.8
6.00	1.00	0.75	5.00	6.4	6.6	7.0
7.00	1.00	0.75	6.00	7.4	7.6	8.0
8.00	1.25	7.00	6.80	8.4	9.0	10.0
10.00	1.50	1.25	8.50	10.5	11.0	12.0
12.00	1.75	1.25	10.20	13.0	13.5	14.5

METRIC DRILL LIST				
DIAMETER	DIAMETER	DIAMETER	DIAMETER	DIAMETER
0.30	0.80	1.55	2.30	3.60
0.32	0.85	1.60	2.35	3.70
0.35	0.90	1.65	2.40	3.80
0.38	0.95	1.70	2.45	3.90
0.40	1.00	1.75	2.50	4.00
0.42	1.05	1.80	2.60	4.10
0.45	1.10	1.85	2.70	4.20
0.48	1.15	1.90	2.80	4.30
0.50	1.20	1.95	2.90	4.40
0.55	1.25	2.00	3.00	4.50
0.60	1.30	2.05	3.10	4.60
0.62	1.35	2.10	3.20	4.70
0.65	1.40	2.15	3.30	4.80
0.70	1.45	2.20	3.40	4.90
0.78	1.50	2.25	3.50	5.00

## MECHANICAL PROPERTIES

**Table C**

Mechanical Properties (Machine Design in Mechanical Design - Robert L. Mott)

MATERIAL	Hardness (Rockwell)	Tension Modulus (E)	Tensile Strength	Yield Strength	Shear Strength	Endurance Limit
303 Stainless Steel	B75-90	28 X 10 <sup>6</sup> PSI 194 GPA	90 X 10 <sup>3</sup> PSI 623 MPA	35 X 10 <sup>3</sup> PSI 242 MPA	75 X 10 <sup>3</sup> PSI 517 MPA	35 X 10 <sup>3</sup> PSI 242 MPA
17-4 PH Stainless Steel	C28-35	28.5 X 10 <sup>6</sup> PSI 197 GPA	150 X 10 <sup>3</sup> PSI 1040 MPA	125 X 10 <sup>3</sup> PSI 865 MPA	83 X 10 <sup>3</sup> PSI 574 MPA	90 X 10 <sup>3</sup> PSI 623 MPA
416 Stainless Steel	C26-36	29 X 10 <sup>6</sup> PSI 201 GPA	75 X 10 <sup>3</sup> PSI 519 MPA	40X 10 <sup>3</sup> PSI 277 MPA	75 X 10 <sup>3</sup> PSI 517 MPA	40 X 10 <sup>3</sup> PSI 277 MPA
416 Stainless Steel - Hardened	C36-42	29 X 10 <sup>6</sup> PSI 201 GPA	135 X 10 <sup>3</sup> PSI 930 MPA	105 X 10 <sup>3</sup> PSI 725 MPA	75 X 10 <sup>3</sup> PSI 517 MPA	40 X 10 <sup>3</sup> PSI 277 MPA
12 L14 Steel	B75-90	30 X 10 <sup>6</sup> PSI 208 GPA	78 X 10 <sup>3</sup> PSI 540 MPA	60 X 10 <sup>3</sup> PSI 415 MPA	50 X 10 <sup>3</sup> PSI 345 MPA	--
2024T4 Aluminum	--	10.6 X 10 <sup>6</sup> PSI 73.4 GPA	68 X 10 <sup>3</sup> PSI 470 MPA	47 X 10 <sup>3</sup> PSI 325 MPA	40 X 10 <sup>3</sup> PSI 276 MPA	--
464 Brass Alloy	--	18 X 10 <sup>6</sup> PSI 125 GPA	57 X 10 <sup>3</sup> PSI 395 MPA	25 X 10 <sup>3</sup> PSI 173 MPA	40 X 10 <sup>3</sup> PSI 276 MPA	--
360 Brass Alloy	--	14 X 10 <sup>6</sup> PSI 97 GPA	49 X 10 <sup>3</sup> PSI 339 MPA	18 X 10 <sup>3</sup> PSI 125 MPA	30 X 10 <sup>3</sup> PSI 205 MPA	--