DECIMAL EQUIVALENT OF NUMBERED DRILL SIZES

No.	Size of Drill in Inches	No.	Size of Drill in Inches	No.	Size of Drill in Inches	No.	Size of Drill in Inches
1	.2280	21	.1590	41	.0960	61	.0390
2	.2210	22	.1570	42	.0935	62	.0380
3	.2130	23	.1540	43	.0890	63	.0370
4	.2090	24	.1520	44	.0860	64	.0360
5	.2055	25	.1495	45	.0820	65	.0350
6	.2040	26	.1470	46	.0810	66	.0330
7	.2010	27	.1440	47	.0785	67	.0320
8	.1990	28	.1405	48	.0760	68	.0310
9	.1960	29	.1360	49	.0730	69	.0292
10	.1935	30	.1285	50	.0700	70	.0280
11	.1910	31	.1200	51	.0670	71	.0260
12	.1890	32	.1160	52	.0635	72	.0250
13	.1850	33	.1130	53	.0595	73	.0240
14	.1820	34	.1110	54	.0550	74	.0225
15	.1800	35	.1100	55	.0520	75	.0210
16	.1770	36	.1065	56	.0465	76	.0200
17	.1730	37	.1040	57	.0430	77	.0180
18	.1695	38	.1015	58	.0420	78	.0160
19	.1660	39	.0995	59	.0410	79	.0145
20	.1610	40	.0980	60	.0400	80	.0135

DECIMAL EQUIVALENT OF LETTER DRILL SIZES

Letter	Size of Drill in Inches	Letter	Size of Drill in Inches
A	.234	N	.302
B	.238	O	.316
C	.242	P	.323
D	.246	Q	.332
E	.250	R	.339
F	.257	S	.348
G	.261	T	.358
H	.266	U	.368
I	.272	V	.377
J	.277	W	.386
K	.281	X	.397
L	.290	Y	.404
M	.295	Z	.413

SCREW TAP & CLEARANCE DRILLS

Screw Size				Tapping Drills			Clearance Drills			
					Equivalents		Close Fit		Free Fit	
Number	Threads/ Inch	Series	Nominal Diam. (in)	Drill Size (65-75% thread)	(decimal)	(mm)	Drill Size	Dec. Equiv.	Drill Size	Dec. Equiv.
000	120		0.0340	71	0.0260	0.6604	65	0.0350	62	0.0380
00	90		0.0470	65	0.0350	0.8890	3/64"	0.0469	55	0.0520
0	80	NF	0.0600	3/64"	0.0469	1.1913	52	0.0635	50	0.0700
1	56	NS	0.0730	54	0.0550	1.3970	48	0.0760	46	0.0810
	64	NC		53	0.0595	1.5113				
	72	NF		53	0.0595	1.5113				
2	56	NC	0.0860	50	0.0700	1.7780	43	0.0890	41	0.0960
	64	NF		50	0.0700	1.7780				
3	48	NC	0.0990	47	0.0785	1.9939	37	0.1040	35	0.1100
	56	NF		45	0.0820	2.0828				
4	36	NS	0.1120	44	0.0860	2.1844	32	0.1160	30	0.1285
	40	NC		43	0.0890	2.2606				
	48	NF		42	0.0935	2.3749				
5	40	NC	0.1250	38	0.1015	2.5781	30	0.1285	29	0.1360
	44	NF		37	0.1040	2.6416				
6	32	NC	0.1380	36	0.1065	2.7051	27	0.1440	25	0.1495
	36	NS		34	0.1110	2.8194				
	40	NF		33	0.1130	2.8702				
8	32	NC	0.1640	29	0.1360	3.4544	18	0.1695	16	0.1770
	36	NF		29	0.1360	3.4544				
	40	NS		28	0.1405	3.5687				
10	24	NC	0.1900	25	0.1495	3.7973	9	0.1960	7	0.2010
	30	NS		22	0.1570	3.9878				
	32	NF		21	0.1590	4.0386				
12	24	NC	0.2160	16	0.1770	4.4958	2	0.2210	1	0.2280
	28	NF		14	0.1820	4.6228				
	32	NEF		13	0.1850	4.6990				
14	20	NS	0.2420	10	0.1935	4.9149	D	0.2460	F	0.2570
	24	NS		7	0.2010	5.1054				

1 inch = 25.4 millimeters

Tap Drill Size (65-75% thread) = Nominal Diameter - One Pitch Length

example : Tap Drill for #6-32 NC screw is #36, closest drill to 0.1067 inches [0.1067 = 0.1380 - (0.0313)]

example : Tap Drill for 1/4-20 NC screw is #7, closest drill to 0.2000 inches [0.2000 = (1/4) - (0.0500)]

example : Tap Drill for M1.4x0.3 is 1.1 mm (1.1 = 1.4 - 0.3)

Nominal Diameter of Number Screw (in.) = (Screw Number x 0.0130) + 0.0600

example : Nominal Diameter of #6 screw is 0.1380 inches [0.1380 = (6 x 0.0130) + 0.0600]

Pitch (in.) = 1 / (Threads per Inch)

exam ple : Pitch of 32 threads per inch is 0.0313 inches (0.0313 = 1/32)

SHEET METAL GAUGE SIZES

GAGE NO.	STEEL	STAINLESS STEEL	ALUMINUM
7	.179	-	-
8	.164	.172	-
9	.150	.156	-
10	.135	.141	-
11	.120	.125	-
12	.105	.109	-
13	.090	.094	.093
14	.075	.078	.079
15	.067	.070	.071
16	.060	.063	.064
17	.054	.056	.058
18	.048	.050	.052
19	.042	.044	.046
20	.036	.038	.040
21	.033	.034	.037
22	.030	.031	.034
23	.027	.028	.031
24	.024	.025	.028
25	.021	.022	.025
26	.018	.019	.022
27	.016	.017	.019
28	.015	.016	-
29	.014	.014	-
30	.012	.013	-

DENSITIES OF METALS

MATERIAL	Kg/m³ Avg	Low	High	Lb/ft³	Lb/in³
Admiralty Brass	8525			532	0.308
Aluminum	2712			169	0.098
Aluminum - melted	2600	2560	2640	162	0.094
Aluminum bronze (3-10% Al)	8200	7700	8700	512	0.296
Aluminum foil	2725	2700	2750	170	0.098
Antifriction metal	9865	9130	10600	616	0.356
Antimony	6690			417	0.242
Beryllium	1840			115	0.066
Beryllium copper	8175	8100	8250	510	0.295
Bismuth	9750			608	0.352
Brass - casting	8550	8400	8700	534	0.309
Brass - rolled and drawn	8580	8430	8730	535	0.310
Brass 60/40	8520			532	0.308
Bronze - lead	8200	7700	8700	512	0.296
Bronze - phosphorous	8850	8780	8920	552	0.320
Bronze (8-14% Sn)	8150	7400	8900	509	0.294
Cadmium	8640			539	0.312
Cast iron	7300	6800	7800	456	0.264
Chemical Lead	11340			708	0.410
Chromium	7190			449	0.260
Cobalt	8746			546	0.316
Constantan	8920			557	0.322
Copper	8940			558	0.323
Cupronickel	8924	8908	8940	557	0.322
Delta metal	8600			537	0.311
Electrum	8650	8400	8900	540	0.312
Gold	19320			1206	0.698
Hatelloy	9245			577	0.334
Inconel	8497			530	0.307
Incoloy	8027			501	0.290
Iron	7850			490	0.284
Lead	11340			708	0.410
Light alloy based on Al	2680	2560	2800	167	0.097
Light alloy based on Mg	1815	1760	1870	113	0.066
Magnesium	1738			108	0.063
Manganese Bronze	8359			522	0.302
Mercury	13593			848	0.491
Molybdenum	10188			636	0.368
Monel	8600	8360	8840	537	0.311
Nickel	8908			556	0.322
Nickel silver	8650	8400	8900	540	0.312
Nimonic	8100			505	0.293
Palladium	12160			759	0.439
Phosphor bronze	8900			555	0.322
Platinum	21400			1335	0.773
Plutonium	19816			1237	0.716
Red Brass	8746			546	0.316
Silver	10490			655	0.379
Sodium	971			61	0.035
Solder 50/50 Pb Sn	8885			554	0.321
Stainless Steel	7740	7480	8000	483	0.280
Steel	7850			490	0.284
Tin	7280			454	0.263
Titanium	4500			281	0.163
Tungsten	19600			1223	0.708
Uranium	18900			1179	0.683
Vanadium	5494			343	0.198
White metal	7100			443	0.257
Wrought Iron	7750			484	0.280
Zinc	7135			445	0.258
Zirconium	6570			410	0.237
Yellow Brass	8470			529	0.306

MM TO INCH CONVERSION

mm	Decimal	mm	Decimal	mm	Decimal	mm	Decimal	mm	Decimal
0.01	.00039	0.41	.01614	0.81	.03189	21	.82677	61	2.40157
0.02	.00079	0.42	.01654	0.82	.03228	22	.86614	62	2.44094
0.03	.00118	0.43	.01693	0.83	.03268	23	.90551	63	2.48031
0.04	.00157	0.44	.01732	0.84	.03307	24	.94488	64	2.51969
0.05	.00197	0.45	.01772	0.85	.03346	25	.98425	65	2.55906
0.06	.00236	0.46	.01811	0.86	.03386	26	1.02362	66	2.59843
0.07	.00276	0.47	.01850	0.87	.03425	27	1.06299	67	2.63780
0.08	.00315	0.48	.01890	0.88	.03465	28	1.10236	68	2.67717
0.09	.00354	0.49	.01929	0.89	.03504	29	1.14173	69	2.71654
0.10	.00394	0.50	.01969	0.90	.03543	30	1.18110	70	2.75591
0.11	.00433	0.51	.02008	0.91	.03583	31	1.22047	71	2.79528
0.12	.00472	0.52	.02047	0.92	.03622	32	1.25984	72	2.83465
0.13	.00512	0.53	.02087	0.93	.03661	33	1.29921	73	2.87402
0.14	.00551	0.54	.02126	0.94	.03701	34	1.33858	74	2.91339
0.15	.00591	0.55	.02165	0.95	.03740	35	1.37795	75	2.95276
0.16	.00630	0.56	.02205	0.96	.03780	36	1.41732	76	2.99213
0.17	.00669	0.57	.02244	0.97	.03819	37	1.45669	77	3.03150
0.18	.00709	0.58	.02283	0.98	.03858	38	1.49606	78	3.07087
0.19	.00748	0.59	.02323	0.99	.03898	39	1.53543	79	3.11024
0.20	.00787	0.60	.02362	1.00	.03937	40	1.57480	80	3.14961
0.21	.00827	0.61	.02402	1	.03937	41	1.61417	81	3.18898
0.22	.00866	0.62	.02441	2	.07874	42	1.65354	82	3.22835
0.23	.00906	0.63	.02480	3	.11811	43	1.69291	83	3.26772
0.24	.00945	0.64	.02520	4	.15748	44	1.73228	84	3.30709
0.25	.00984	0.65	.02559	5	.19685	45	1.77165	85	3.34646
0.26	.01024	0.66	.02598	6	.23622	46	1.81102	86	3.38583
0.27	.01063	0.67	.02638	7	.27559	47	1.85039	87	3.42520
0.28	.01102	0.68	.02677	8	.31496	48	1.88976	88	3.46457
0.29	.01142	0.69	.02717	9	.35433	49	1.92913	89	3.50394
0.30	.01181	0.70	.02756	10	.39370	50	1.96850	90	3.54331
0.31	.01220	0.71	.02795	11	.43307	51	2.00787	91	3.58268
0.32	.01260	0.72	.02835	12	.47244	52	2.04724	92	3.62205
0.33	.01299	0.73	.02874	13	.51181	53	2.08661	93	3.66142
0.34	.01339	0.74	.02913	14	.55118	54	2.12598	94	3.70079
0.35	.01378	0.75	.02953	15	.59055	55	2.16535	95	3.74016
0.36	.01417	0.76	.02992	16	.62992	56	2.20472	96	3.77953
0.37	.01457	0.77	.03031	17	.66929	57	2.24409	97	3.81890
0.38	.01496	0.78	.03071	18	.70866	58	2.28346	98	3.85827
0.39	.01535	0.79	.03110	19	.74803	59	2.32283	99	3.89764
0.40	.01575	0.80	.03150	20	.78740	60	2.36220	100	3.93701

INCH TO MM CONVERSION

Decimals to Millimeters			
Decimal	mm	Decimal	mm
0.001	0.0254	0.500	12.7000
0.002	0.0508	0.510	12.9540
0.003	0.0762	0.520	13.2080
0.004	0.1016	0.530	13.4620
0.005	0.1270	0.540	13.7160
0.006	0.1524	0.550	13.9700
0.007	0.1778	0.560	14.2240
0.008	0.2032	0.570	14.4780
0.009	0.2286	0.580	14.7320
0.010	0.2540	0.590	14.9860
0.020	0.5080		
0.030	0.7620		
0.040	1.0160	0.600	15.2400
0.050	1.2700	0.610	15.4940
0.060	1.5240	0.620	15.7480
0.070	1.7780	0.630	16.0020
0.080	2.0320	0.640	16.2560
0.090	2.2860	0.650	16.5100
0.100	2.5400	0.660	16.7640
0.110	2.7940	0.670	17.0180
0.120	3.0480	0.680	17.2720
0.130	3.3020	0.690	17.5260
0.140	3.5560		
0.150	3.8100		
0.160	4.0640	0.700	17.7800
0.170	4.3180	0.710	18.0340
0.180	4.5720	0.720	18.2880
0.190	4.8260	0.730	18.5420
		0.740	18.7960
0.200	5.0800	0.750	19.0500
0.210	5.3340	0.760	19.3040
0.220	5.5880	0.770	19.5580
0.230	5.8420	0.780	19.8120
0.240	6.0690	0.790	20.0660
0.250	6.3500		
0.260	6.6040		
0.270	6.8580	0.800	20.3200
0.280	7.1120	0.810	20.5740
0.290	7.3660	0.820	20.8280
0.300	7.6200	0.830	21.0820
0.310	7.8740	0.840	21.3360
0.320	8.1280	0.850	21.5900
0.330	8.3820	0.860	21.8440
0.340	8.6360	0.870	22.0980
0.350	8.8900	0.880	22.3520
0.360	9.1440	0.890	22.6060
0.370	9.3980		
0.380	9.6520		
0.390	9.9060	0.900	22.8600
		0.910	23.1140
0.400	10.1600	0.920	23.3680
0.410	10.4140	0.930	23.6220
0.420	10.6680	0.940	23.8760
0.430	10.9220	0.950	24.1300
0.440	11.1760	0.960	24.3840
0.450	11.4300	0.970	24.6380
0.460	11.6840	0.980	24.8920
0.470	11.9380	0.990	25.1460
0.480	12.1920	1.000	25.4000
0.490	12.4460		

Fractions to Decimals to Millimeters					
Fraction	Decimal	mm	Fraction	Decimal	mm
1/64	0.0156	0.3969	33/64	0.5156	13.0969
1/32	0.0312	0.7938	17/32	0.5312	13.4938
3/64	0.0469	1.1906	35/64	0.5469	13.8906
1/16	0.0625	1.5875	9/16	0.5625	14.2875
5/64	0.0781	1.9844	37/64	0.5781	14.6844
3/32	0.0938	2.3812	19/32	0.5938	15.0812
7/64	0.1094	2.7781	39/64	0.6094	15.4781
1/8	0.1250	3.1750	5/8	0.6250	15.8750
9/64	0.1406	3.5719	41/64	0.6406	16.2719
5/32	0.1562	3.9688	21/32	0.6562	16.6688
11/64	0.1719	4.3656	43/64	0.6719	17.0656
3/16	0.1875	4.7625	11/16	0.6875	17.4625
13/64	0.2031	5.1594	45/64	0.7031	17.8594
7/32	0.2188	5.5562	23/32	0.7188	18.2562
15/64	0.2344	5.9531	47/64	0.7344	18.6531
1/4	0.2500	6.3500	3/4	0.7500	19.0500
17/64	0.2656	6.7469	49/64	0.7656	19.4469
9/32	0.2812	7.1438	25/32	0.7812	19.8438
19/64	0.2969	7.5406	51/64	0.7969	20.2406
5/16	0.3125	7.9375	13/16	0.8125	20.6375
21/64	0.3281	8.3344	53/64	0.8281	21.0344
11/32	0.3438	8.7312	27/32	0.8438	21.4312
23/64	0.3594	9.1281	55/64	0.8594	21.8281
3/8	0.3750	9.5250	7/8	0.8750	22.2250
25/64	0.3906	9.9219	57/64	0.8906	22.6219
13/32	0.4062	10.3188	29/32	0.9062	23.0188
27/64	0.4219	10.7156	59/64	0.9219	23.4156
7/16	0.4375	11.1125	15/16	0.9375	23.8125
29/64	0.4531	11.5094	61/64	0.9531	24.2094
15/32	0.4688	11.9062	31/32	0.9688	24.6062
31/64	0.4844	12.3031	63/64	0.9844	25.0031
1/2	0.5000	12.700	1	1.0000	25.4000

INCH FRACTIONS TO DECIMAL

8ths	32nds	64ths	64ths
1/8 = .125	1/32 = .03125	1/64 = .015625	33/64 = .515625
1/4 = .250	3/32 = .09375	3/64 = .046875	35/64 = .546875
3/8 = .375	5/32 = .15625	5/64 = .078125	37/64 = .578125
1/2 = .500	7/32 = .21875	7/64 = .109375	39/64 = .609375
5/8 = .625	9/32 = .28125	9/64 = .140625	41/64 = .640625
3/4 = .750	11/32 = .34375	11/64 = .171875	43/64 = .671875
7/8 = .875	13/32 = .40625	13/64 = .203125	45/64 = .703125
16ths	15/32 = .46875	15/64 = .234375	47/64 = .734375
1/16 = .0625	17/32 = .53125	17/64 = .265625	49/64 = .765625
3/16 = .1875	19/32 = .59375	19/64 = .296875	51/64 = .796875
5/16 = .3125	21/32 = .65625	21/64 = .328125	53/64 = .828125
7/16 = .4375	23/32 = .71875	23/64 = .359375	55/64 = .859375
9/16 = .5625	25/32 = .78125	25/64 = .390625	57/64 = .890625
11/16 = .6875	27/32 = .84375	27/64 = .421875	59/64 = .921875
13/16 = .8125	29/32 = .90625	29/64 = .453125	61/64 = .953125
15/16 = .9375	31/32 = .96875	31/64 = .484375	63/64 = .984375

TEMP ESTIMATES FOR HEAT TREATEMENT

Degrees Centigrade	Degrees Fahrenheit	High Temperatures Judged by Color
400	752	Red heat, visible in the dark
525	975	Red heat, visible in daylight
700	1292	Dark red
900	1652	Cherry-red
1100	2012	Orange-red
1300	2372	Yellow-white
1500	2732	Brilliant white

Degrees Centigrade	Degrees Fahrenheit	Colors for Tempering
221.1	430	Very pale yellow
237.8	460	Straw-yellow
254.4	490	Yellow-brown
260.0	500	Brown-yellow
271.1	520	Brown-purple
282.2	540	Full purple
293.3	560	Full blue

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