



Units and Conversion Factors

Decimal Equivalents

DRILL SIZE	mm	DECIMAL INCHES	DRILL SIZE	mm	DECIMAL INCHES	DRILL SIZE	mm	DECIMAL INCHES	DRILL SIZE	mm	DECIMAL INCHES
-	0.10	.0039	45	2.08	.0820	5	5.22	.2055	7/16	11.11	.4375
-	0.20	.0079	44	2.18	.0860	4	5.31	.2090	29/64	11.51	.4531
-	0.25	.0098	43	2.26	.0890	3	5.41	.2130	15/32	11.91	.4688
-	0.30	.0118	42	2.37	.0935	7/32	5.56	.2188	-	12.00	.4724
80	0.34	.0135	3/32	2.38	.0938	2	5.61	.2210	31/64	12.30	.4844
79	0.37	.0145	41	2.44	.0960	1	5.79	.2280	1/2	12.70	.5000
1/64	0.40	.0156	40	2.50	.0980	A	5.94	.2340	-	13.00	.5118
78	0.41	.0160	39	2.53	.0995	15/64	5.95	.2344	33/64	13.10	.5156
77	0.46	.0180	38	2.58	.1015	-	6.00	.2362	17/32	13.49	.5312
-	0.50	.0197	37	2.64	.1040	B	6.05	.2380	35/64	13.89	.5469
76	0.51	.0200	36	2.71	.1065	C	6.15	.2420	-	14.00	.5512
75	0.53	.0210	7/64	2.78	.1094	D	6.25	.2460	9/16	14.29	.5625
74	0.57	.0225	35	2.79	.1100	1/4	6.35	.2500	37/64	14.68	.5781
-	0.60	.0236	34	2.82	.1110	E	6.35	.2500	-	15.00	.5906
73	0.61	.0240	33	2.87	.1130	F	6.53	.2570	19/32	15.08	.5938
72	0.64	.0250	32	2.95	.1160	G	6.63	.2610	39/64	15.48	.6094
71	0.66	.0260	-	3.00	.1181	17/64	6.75	.2656	5/8	15.88	.6250
-	0.70	.0276	31	3.05	.1200	H	6.76	.2660	-	16.00	.6299
70	0.71	.0280	1/8	3.18	.1250	I	6.91	.2720	41/64	16.27	.6406
69	0.74	.0292	30	3.26	.1285	-	7.00	.2756	21/32	16.67	.6562
-	0.75	.0295	29	3.45	.1360	J	7.04	.2770	-	17.00	.6693
68	0.79	.0310	28	3.57	.1405	K	7.14	.2810	43/64	17.07	.6719
1/32	0.79	.0313	9/64	3.57	.1406	9/32	7.14	.2812	11/16	17.46	.6875
-	0.80	.0315	27	3.66	.1440	L	7.37	.2900	45/64	17.86	.7031
67	0.81	.0320	26	3.73	.1470	M	7.49	.2950	-	18.00	.7087
66	0.84	.0330	25	3.80	.1495	19/64	7.54	.2969	23/32	18.26	.7188
65	0.89	.0350	24	3.86	.1520	N	7.67	.3020	47/64	18.65	.7344
-	0.90	.0354	23	3.91	.1540	5/16	7.94	.3125	-	19.00	.7480
64	0.91	.0360	5/32	3.97	.1562	-	8.00	.3150	3/4	19.05	.7500
63	0.94	.0370	22	3.99	.1570	O	8.03	.3160	49/64	19.45	.7656
62	0.97	.0380	-	4.00	.1575	P	8.20	.3230	25/32	19.84	.7812
61	0.99	.0390	21	4.04	.1590	21/64	8.33	.3281	-	20.00	.7874
-	1.00	.0394	20	4.09	.1610	Q	8.43	.3320	51/64	20.24	.7969
60	1.02	.0400	19	4.22	.1660	R	8.61	.3390	13/16	20.64	.8125
59	1.04	.0410	18	4.31	.1695	11/32	8.73	.3438	-	21.00	.8268
58	1.07	.0420	11/64	4.37	.1719	S	8.84	.3480	53/64	21.03	.8281
57	1.09	.0430	17	4.39	.1730	-	9.00	.3543	27/32	21.43	.8438
56	1.18	.0465	16	4.50	.1770	T	9.09	.3580	55/64	21.84	.8594
3/64	1.19	.0469	15	4.57	.1800	23/64	9.13	.3594	-	22.00	.8661
55	1.34	.0520	14	4.62	.1820	U	9.35	.3680	7/8	22.23	.8750
54	1.40	.0550	13	4.70	.1850	3/8	9.53	.3750	57/64	22.62	.8906
53	1.51	.0595	3/16	4.76	.1875	V	9.56	.3770	-	23.00	.9055
1/16	1.59	.0625	12	4.80	.1890	W	9.80	.3860	29/32	23.02	.9062
52	1.61	.0635	11	4.85	.1910	25/64	9.92	.3906	59/64	23.42	.9219
51	1.70	.0670	10	4.91	.1935	-	10.00	.3937	15/16	23.81	.9375
50	1.78	.0700	9	4.98	.1960	X	10.08	.3970	-	24.00	.9449
49	1.85	.0730	-	5.00	.1968	Y	10.26	.4040	61/64	24.21	.9531
48	1.93	.0760	8	5.05	.1990	13/32	10.32	.4062	31/32	24.61	.9688
5/64	1.98	.0781	7	5.11	.2010	Z	10.49	.4130	-	25.00	.9842
47	1.99	.0785	13/64	5.16	.2031	27/64	10.72	.4219	63/64	25.00	.9844
-	2.00	.0787	6	5.18	.2010	-	11.00	.4331	1"	25.40	1.0000
46	2.06	.0810									

Temperature

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

$$^{\circ}\text{C} = 0.555 (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{K} = ^{\circ}\text{C} + 273.2$$

Fahrenheit	Celsius	Rankine	Kelvin
602	316.7	1061.7	589.9
572	300.0	1031.7	573.2
542	283.3	1001.7	556.5
512	266.7	971.7	539.9
482	250.0	941.7	523.2
452	233.3	911.7	506.5
422	216.7	881.7	489.9
392	200.0	851.7	473.2
362	183.3	821.7	456.5
332	166.7	791.7	439.9
302	150.0	761.7	423.2
272	133.3	731.7	406.5
242	116.7	701.7	389.9
212	100.0	671.7	373.2
182	83.3	641.7	356.5
152	66.7	611.7	339.9
122	50.0	581.7	323.2
92	33.3	551.7	306.5
62	16.7	521.7	289.9
32	0.0	491.7	273.2
2	-16.7	461.7	256.5
-28	-33.3	431.7	239.9
-58	-50.0	401.7	223.2
-88	-66.7	371.7	206.5
-118	-83.3	341.7	189.9
-148	-100.0	311.7	173.2
-178	-116.7	281.7	156.5
-208	-133.3	251.7	139.9
-238	-150.0	221.7	123.2
-268	-166.7	191.7	106.5
-298	-183.3	161.7	89.9
-328	-200.0	131.7	73.2
-358	-216.7	101.7	56.5
-388	-233.3	71.7	39.9
-418	-250.0	41.7	23.2
-459.7	-273.2	0.0	0.0



TAP DRILL SIZES

TAP SIZE	DRILL SIZE	PROBABLE % THREAD	TAP SIZE	DRILL SIZE	PROBABLE % THREAD	TAP SIZE	DRILL SIZE	PROBABLE % THREAD
0-80	3/64	71-81	10-32	21	68-76	5/8-18	37/64	58-65
M1.6 X .35	1.25mm	69-77	M5 X .8	4.2mm	69-77	M16 X 2	35/64	76-81
1-64	53	59-67	12-24	16	66-72	3/4-10	21/32	68-72
M2 X .4	1/16	72-79	12-28	15	70-78	3/4-16	11/16	71-77
1-72	53	67-75	M6 X 1	10	76-84	M20 X 2.5	11/16*	74-78
2-56	50	62-69	1/4-20	7	70-75	7/8-9	49/64	72-76
2-64	50	70-79	1/4-28	3	72-80	7/8-14	13/16	62-67
M2.5 X .45	2.05mm	69-77	5/16-18	F	72-77	M24 X 3	53/64	72-76
3-48	5/64	70-77	5/16-24	1	67-75	1-8	7/8	73-77
3-56	46	69-78	M8 X 1.25	6.7mm	74-80	1-12	59/64	67-72
4-40	43	65-71	3/8-16	5/16	72-77	1-14	15/16	61-67
4-48	42	61-68	3/8-24	Q	71-79	1-1/8-7	63/64	72-76
M3 X .5	40	70-79	M10 X 1.5	8.4mm	76-82	1-1/8-12	1-3/34	66-72
5-40	38	65-72	7/16-14	U	70-75	M30 X 3.5	1-3/64*	75
5-44	37	63-71	7/16-20	25/64	65-72	1-1/4-7	1-7/64*	76
M3.5 X 6	33	72-81	M12 X 1.75	13/32	69-74	1-1/4-12	1-11/64*	72
6-32	36	71-78	1/2-13	27/64	73-78	1-3/8-6	1-7/32*	72
6-40	33	69-77	1/2-20	29/34	65-72	1-3/8-12	1-16/64*	72
M4 X .7	3.25mm	74-82	M14 X 2	15/32	76-81	M36 X 4	1-1/4*	82
8-32	29	62-69	9/16-12	31/64	68-72	1-1/2-6	1-11/32*	72
8-36	29	70-78	9/16-18	33/64	58-65	1-1/2-12	1-27/64	72
10-24	25	69-75	5/8-11	17/3	75-79			

PIPE TAP DRILL SIZES

TAP SIZE	TAPER PIPE NPT & NPTF	DECIMAL EQUIVALENT	STRAIGHT PIPE NPS	DECIMAL EQUIVALENT
1/8-27	R	.3390	11/32	.3438
1/4-18	7-16	.4375	29/64	.4531
3/8-18	37/64	.5781	37/64	.5781
1/2-14	45/64	.7031	23/32	.7188
3/4-14	59/64	.9219	59/64	.9219
1 - 11-1/2	1-5/32	1.1562	1-5/32	1.1562
1-1/4 - 11-1/2	1-1/2	1.5000	1-1/2	1.5000
1-1/2 - 11-1/2	1-47/64	1.7344	1-3/4	1.7500
2 - 11-1/2	2-7/32	2.2188	2-7/32	2.2188
2-1/8 - 8	2-41/64	2.6406	2-21/32	2.6562
3 - 8	3-17/64	3.2656	-	-

METRIC TO STANDARD CONVERSIONS

Millimeters (mm) x 0.03937	=	inches (") (in)
Centimeters (cm) x 0.3937	=	inches (") (in)
Meters (m) x 39.37	=	inches (") (in)
Meters (m) x 3.281	=	feet (') (ft)
Meters (m) x 1.094	=	yards (yds)
Kilometers (km) x 0.62137	=	miles (mi)
Kilometers (km) x 3280.87	=	feet (') (ft)
Liters (l) x 0.2642	=	gallons (U.S.) (gals)
Liters (l) x 0.0353	=	cubic feet
Bars x 14.5038	=	pounds per square inch (PSI)
Kilograms (kg) x 2.205	=	pounds (P)
Kilometers (km) x 1093.62	=	yards (yds)
Square centimeters x 0.155	=	square inches
Square meters x 10.76	=	square feet
Square kilometers x 0.386	=	square miles
Cubic centimeters x 0.06102	=	cubic inches
Cubic meters x 35.315	=	cubic feet



Units and Conversion Factors

Density

	slug / ft ³	Kilogram / Meters ³	g / cm ³	lb / ft ³	lb / in. ³
1 slug per ft ³ =	1	515.4	.5154	32.17	1.862×10^{-2}
1 Kilogram per Meter ³ =	1.940×10^{-3}	1	0.001	6.243×10^{-2}	3.613×10^{-5}
1 gram per cm ³ =	1.940	1000	1	62.43	3.613×10^{-2}
1 pound per ft ³ =	3.108×10^{-2}	16.02	1.602×10^{-2}	1	5.787×10^{-4}
1 pound per in. ³ =	53.71	2.768×10^4	27.68	1728	1

Force

Quantities in the shaded areas are not force units but are often used as such. For instance, if we write 1 gram-force = 980.7 dynes, we mean that a gram-mass experiences a force of 980.7 dynes under standard conditions of gravity ($g = 9.80667 \text{ m/s}^2$)

	dyne	NEWTON	lb	pdl	gf	kgf
1 dyne =	1	10^{-5}	2.248×10^{-6}	7.233×10^{-5}	1.020×10^{-3}	1.020×10^{-6}
1 NEWTON =	10	1	0.2248	7.233	102.0	0.1020
1 pound =	4.448×10^5	4.448	1	32.17	453.6	0.4536
1 poundal =	1.383×10^4	0.1383	3.108×10^{-2}	1	14.10	1.410×10^{-2}
1 gram-force =	980.7	9.807×10^{-3}	2.205×10^{-3}	7.093×10^{-2}	1	0.001
1 kilogram-force =	9.807×10^5	9.807	2.205	70.93	1000	1

Pressure

	atm	dyne / cm ²	inch of water	cm Hg	PASCAL	lb / in. ²	lb / ft ²
1 atmosphere =	1	1.013×10^6	406.8	76	1.013×10^5	14.70	2116
1 dyne per cm ² =	9.869×10^{-7}	1	4.015×10^{-4}	7.501×10^{-5}	0.1	1.405×10^{-5}	2.089×10^{-3}
1 inch of water ^a at 4°C =	2.458×10^{-3}	2491	1	0.1868	249.1	3.613×10^{-2}	5.202
1 centimeter of mercury at 0°C =	1.316×10^{-2}	1.333×10^4	5.353	1	1333	0.1934	27.85
1 PASCAL =	9.869×10^{-6}	10	4.015×10^{-3}	7.501×10^{-4}	1	1.450×10^{-4}	2.089×10^{-2}
1 pound per in. ² =	6.805×10^{-2}	6.895×10^4	27.68	5.171	6.895×10^3	1	144
1 pound per ft ² =	4.725×10^{-4}	478.8	0.1922	3.591×10^{-2}	47.88	6.944×10^{-3}	1

^a Where the acceleration of gravity has the standard value 9.80665 m/s^2 .

1 bar = 10^6 dyne / cm^2 = 0.1 MPa 1 millibar = 10^3 dyne / cm^2 = 10^2 Pa 1 Torr = 1 millimeter of mercury