



CHART OF STANDARD INDUSTRIAL CONVERSIONS

STANDARD WIRE GAUGES

GAUGE	Diameter (mm)	Diameter (Inches)
7/0	12.700	0.500
6/0	11.786	0.464
5/0	10.973	0.432
4/0	10.160	0.400
3/0	9.449	0.372
2/0	8.839	0.348
0	8.230	0.324
1	7.620	0.300
2	7.010	0.276
3	6.401	0.252
4	5.893	0.232
5	5.385	0.212
6	4.877	0.192
7	4.470	0.176
8	4.064	0.160
9	3.658	0.144
10	3.251	0.128
11	2.946	0.116
12	2.642	0.104
13	2.337	0.092
14	2.032	0.080
15	1.829	0.072
16	1.626	0.064
17	1.422	0.056
18	1.219	0.048
19	1.016	0.040
20	0.914	0.036
21	0.813	0.032
22	0.711	0.028
23	0.610	0.024
24	0.559	0.022
25	0.508	0.020
26	0.457	0.018
27	0.4166	0.0164
28	0.3759	0.0148
29	0.3454	0.0136
30	0.3150	0.0124
31	0.2946	0.0116
32	0.2743	0.0108
33	0.2540	0.0100
34	0.2337	0.0092
35	0.2134	0.0084
36	0.1930	0.0076
37	0.1727	0.0068
38	0.1524	0.0060
39	0.1321	0.0052
40	0.1219	0.0048
41	0.1118	0.0045
42	0.1015	0.0040
43	0.0914	0.0036
44	0.0813	0.0032
45	0.0713	0.0028
46	0.0610	0.0024
47	0.0507	0.0020
48	0.0406	0.0016
49	0.0305	0.0012
50	0.0252	0.0010

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	46	2.06	.0810	6	5.18	.2040	---	11.00	.4331
---	0.20	.0079	45	2.08	.0820	5	5.22	.2055	7/16	11.11	.4375
---	0.25	.0098	44	2.18	.0860	4	5.31	.2090	29/64	11.51	.4531
---	0.30	.0118	43	2.26	.0890	3	5.41	.2130	15/32	11.91	.4688
80	0.34	.0135	42	2.37	.0935	7/32	5.56	.2188	---	12.00	.4724
79	0.37	.0145	3/32	2.38	.0938	2	5.61	.2210	31/64	12.30	.4844
1/64	0.40	.0156	41	2.44	.0960	1	5.79	.2280	1/2	12.70	.5000
78	0.41	.0160	40	2.49	.0980	A	5.94	.2340	---	13.00	.5118
77	0.46	.0180	39	2.53	.0995	15/64	5.94	.2344	33/64	13.10	.5156
---	0.50	.0197	38	2.58	.1015	---	6.00	.2362	17/32	13.46	.5312
76	0.51	.0200	37	2.64	.1040	B	6.05	.2380	35/64	13.89	.5469
75	0.53	.0210	36	2.71	.1065	C	6.15	.2420	---	14.00	.5512
74	0.57	.0225	7/64	2.78	.1094	D	6.25	.2460	9/16	14.29	.5625
---	0.60	.0236	35	2.79	.1100	1/4	6.35	.2500	37/64	14.68	.5781
73	0.61	.0240	34	2.82	.1110	E	6.35	.2500	---	15.00	.5906
72	0.64	.0250	33	2.87	.1130	F	6.53	.2570	19/32	15.08	.5938
71	0.66	.0260	32	2.95	.1160	G	6.63	.2610	39/64	15.48	.6094
---	0.70	.0276	---	3.00	.1181	17/64	6.75	.2656	5/8	15.88	.6250
70	0.71	.0280	31	3.05	.1200	H	6.76	.2660	---	16.00	.6299
69	0.74	.0292	1/8	3.18	.1250	I	6.91	.2720	41/64	16.37	.6406
---	0.75	.0295	30	3.26	.1285	---	7.00	.2756	21/32	16.67	.6562
68	0.79	.0310	29	3.45	.1360	J	7.04	.2770	---	17.00	.6693
1/32	0.79	.0313	28	3.57	.1405	K	7.14	.2810	43/64	17.07	.6719
---	0.80	.0315	9/64	3.57	.1406	9/32	7.14	.2812	11/16	17.46	.6875
67	0.81	.0320	27	3.66	.1440	L	7.37	.2900	45/64	17.86	.7031
66	0.84	.0330	26	3.73	.1470	M	7.49	.2950	---	18.00	.7087
65	0.89	.0350	25	3.80	.1495	19/64	7.54	.2969	23/32	18.25	.7188
---	0.90	.0354	24	3.86	.1520	N	7.67	.3020	47/64	18.65	.7344
64	0.91	.0360	23	3.91	.1540	5/16	7.94	.3125	---	19.00	.7480
63	0.94	.0370	5/32	3.97	.1562	---	8.00	.3150	3/4	19.05	.7500
62	0.97	.0380	22	3.99	.1570	O	8.03	.3160	49/64	19.45	.7656
61	0.99	.0390	---	4.00	.1575	P	8.20	.3230	25/32	19.84	.7812
---	1.00	.0394	21	4.04	.1590	21/64	8.33	.3281	---	20.00	.7874
60	1.02	.0400	20	4.09	.1610	Q	8.43	.3320	51/64	20.24	.7969
59	1.04	.0410	19	4.22	.1660	R	8.61	.3390	13/16	20.64	.8125
58	1.07	.0420	18	4.31	.1695	11/32	8.73	.3438	---	21.00	.8269
57	1.09	.0430	11/64	4.37	.1719	S	8.84	.3480	53/64	21.03	.8281
56	1.18	.0465	17	4.39	.1730	---	9.00	.3543	27/32	21.46	.8438
3/64	1.19	.0469	16	4.50	.1770	T	9.09	.3580	55/64	21.83	.8594
55	1.32	.0520	15	4.57	.1800	23/64	9.13	.3594	---	22.00	.8661
54	1.40	.0550	14	4.62	.1820	U	9.35	.3680	7/8	22.23	.8750
53	1.51	.0595	13	4.70	.1850	3/8	9.53	.3750	57/64	22.62	.8906
1/16	1.59	.0625	3/16	4.76	.1875	V	9.58	.3770	---	23.00	.9055
52	1.61	.0635	12	4.80	.1890	W	9.80	.3860	29/32	23.02	.9062
51	1.70	.0670	11	4.85	.1910	25/64	9.92	.3906	59/64	23.42	.9219
50	1.78	.0700	10	4.91	.1935	---	10.00	.3937	15/16	23.81	.9375
49	1.85	.0730	9	4.98	.1960	X	10.08	.3970	---	24.00	.9449
48	1.93	.0760	---	5.00	.1968	Y	10.26	.4040	61/64	24.21	.9531
5/64	1.98	.0781	8	5.05	.1990	13/32	10.32	.4062	31/32	24.61	.9688
47	1.99	.0785	7	5.11	.2010	Z	10.49	.4130	---	25.00	.9842
---	2.00	.0787	13/64	5.16	.2031	27/64	10.72	.4219	63/64	25.00	.9844

APPROXIMATE WEIGHT CALCULATIONS FORMULAE IMPERIAL SIZES

Squares / Flats	W x T x 1.540	=	kg/ft
Hexagons	(A/F) ² x 1.334	=	kg/ft
Rounds	(Diameter) ² x 1.210	=	kg/ft

kg/ft x 3.2808 = kg/metre

APPROXIMATE WEIGHT CALCULATIONS FORMULAE METRIC SIZES

Squares / Flats	W x T x 0.002388	=	kg/ft
Hexagons	(A/F) ² x 0.002068	=	kg/ft
Rounds	(Diameter) ² x 0.001875	=	kg/ft

kg/ft x 3.2808 = kg/metre

CONVERSION FACTORS

To Convert	Multiply by	To Convert	Multiply by
Centimetres to inches	0.3937	Metres to feet	3.281
Cubic centimetres to cubic inches	0.06103	Miles to kilometres	1.609
Cubic feet to cubic metres	0.02832	Millimetres to inches	0.0394
Cubic inches to cubic centimetres	16.39	N/mm ² to tons f/in ²	0.06475
Cubic inches to litres	0.01639	Pounds to kilograms	0.4536
Cubic metres to cubic feet	35.32	Pounds per foot to kilos per metre	1.488
Cubic metres to cubic yards	1.308	Square centimetres to sq. inches	0.1550
Cubic yards to cubic metres	0.7645	Square feet to sq. metres	0.09290
Feet to metres	0.3048	Square inches to sq. centimetres	6.452
Foot pounds to kilogram metres	0.1382	Square metres to sq. feet	10.76
Gallons to litres	4.536	Inches to cetimetres	2.540
Gallons to cubic feet	0.1606	Tons per sq. inch to kilos per sq. mm	1.575
Grains to grams	0.06480	Tons per f/in ² to N/mm ²	15.444
Grams to lbs	0.002205	Tons to kilograms	1016.0
Inches to millimetres	25.40		
Kilogram metres to foot pounds	7.233		
Kilogram to lbs	2.205		
Kilograms to tons	0.0009842		
Kilos per sq mm to tons per sq in	0.635		

V. BELT LENGTH FORMULA

$$\text{Length} = \text{Dia} + \text{Dia} \times 1.65 + 2(\text{CD})$$

$$\text{CD} = \frac{\text{Length} - \text{D} + \text{d} (1.65)}{2}$$

TAP DRILL SIZES

UNIFIED NATIONAL THREADS - 60° Included Angle

NOMINAL DIAMETER	UNC		UNF		NPT & TPS		
Fractional (Inches)	TPI	Drill Size (mm)	TPI	Drill Size (mm)	TPI	Drill Size (mm)	Drill Size (mm)
1/16	---	---	---	---	27	6.00	6.30
3/32	---	---	---	---	---	---	---
1/8	---	---	---	---	27	8.40	8.70
5/32	---	---	---	---	---	---	---
3/16	---	---	---	---	---	---	---
7/32	---	---	---	---	---	---	---
1/4	20	5.10	28	5.50	18	10.70	11.10
5/16	18	6.60	24	6.90	---	---	---
3/8	16	8.00	24	8.50	18	14.25	14.50
7/16	14	9.40	20	9.90	---	---	---
1/2	13	10.80	20	11.50	14	17.50	18.00
9/16	12	12.20	18	12.90	---	---	---
5/8	11	13.50	18	14.50	---	---	---
11/16	---	---	---	---	---	---	---
3/4	10	16.50	16	17.50	14	22.75	23.25
13/16	---	---	---	---	---	---	---
7/8	9	19.50	14	20.40	---	---	---
15/16	---	---	---	---	---	---	---
1	8	22.25	12	23.25	11.50	28.50	29.00
1.1/8	7	25.00	12	26.50	---	---	---
1.1/4	7	28.00	12	29.50	11.50	37.50	38.00
1.3/8	6	30.75	12	32.75	---	---	---
1.1/2	6	34.00	12	36.00	11.50	43.50	44.00
1.5/8	---	---	---	---	---	---	---
1.3/4	5	39.50	---	---	---	---	---
1.7/8	---	---	---	---	---	---	---
2	---	---	---	---	11.50	55.00	56.00

BRITISH STANDARD WHITWORTH THREADS - 60° Included Angle

NOMINAL DIAMETER	BSW		BSF		BSP & BSPT	
Fractional (Inches)	TPI	Drill Size (mm)	TPI	Drill Size (mm)	TPI	Drill Size (mm)
1/16	60	1.20	---	---	---	---
3/32	48	1.90	---	---	---	---
1/8	40	2.55	---	---	28	8.80
5/32	32	3.20	---	---	---	---
3/16	24	3.70	32	4.00	---	---
7/32	24	4.50	28	4.60	---	---
1/4	20	5.10	26	5.30	19	11.80
9/32	20	5.80	26	6.00	---	---
5/16	18	6.50	22	6.80	---	---
3/8	16	7.90	20	8.30	19	15.25
7/16	14	9.30	18	3.70	---	---
1/2	12	10.50	16	11.10	14	19.00
9/16	12	12.10	16	12.70	---	---
5/8	11	13.50	14	14.00	14	21.00
11/16	11	15.10	14	15.50	---	---
3/4	10	16.25	12	16.75	14	24.50
7/8	9	19.25	11	19.75	14	28.25
15/16	9	20.60	11	21.50	---	---



DECIMAL EQUIVALENTS FOR STANDARD WIRE GAUGES

GAUGE	Diameter (mm)	Diameter (Inches)
7/0	12.700	0.500
6/0	11.786	0.464
5/0	10.973	0.432
4/0	10.160	0.400
3/0	9.449	0.372
2/0	8.839	0.348
0	8.230	0.324
1	7.620	0.300
2	7.010	0.276
3	6.401	0.252
4	5.893	0.232
5	5.385	0.212
6	4.877	0.192
7	4.470	0.176
8	4.064	0.160
9	3.658	0.144
10	3.251	0.128
11	2.946	0.116
12	2.642	0.104
13	2.337	0.092
14	2.032	0.080
15	1.829	0.072
16	1.626	0.064
17	1.422	0.056
18	1.219	0.048
19	1.016	0.040
20	0.914	0.036
21	0.813	0.032
22	0.711	0.028
23	0.610	0.024
24	0.559	0.022
25	0.508	0.020
26	0.457	0.018
27	0.4166	0.0164
28	0.3759	0.0148
29	0.3454	0.0136
30	0.3150	0.0124
31	0.2946	0.0116
32	0.2743	0.0108
33	0.2540	0.0100
34	0.2337	0.0092
35	0.2134	0.0084
36	0.1930	0.0076
37	0.1727	0.0068
38	0.1524	0.0060
39	0.1321	0.0052
40	0.1219	0.0048
41	0.1118	0.0045
42	0.1015	0.0040
43	0.0914	0.0036
44	0.0813	0.0032
45	0.0713	0.0028
46	0.0610	0.0024
47	0.0507	0.0020
48	0.0406	0.0016
49	0.0305	0.0012
50	0.0252	0.0010

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	46	2.06	.0810	6	5.18	.2040	---	11.00	.4331
---	0.20	.0079	45	2.08	.0820	5	5.22	.2055	7/16	11.11	.4375
---	0.25	.0069	44	2.18	.0860	4	5.31	.2090	29/64	11.51	.4531
---	0.30	.0118	43	2.26	.0890	3	5.41	.2130	15/32	11.91	.4688
80	0.34	.0135	42	2.37	.0935	7/32	5.56	.2188	---	12.00	.4724
79	0.37	.0145	3/32	2.38	.0938	2	5.61	.2210	31/64	12.30	.4844
1/64	0.40	.0156	41	2.44	.0960	1	5.79	.2280	1/2	12.70	.5000
78	0.41	.0160	40	2.49	.0980	A	5.94	.2340	---	13.00	.5118
77	0.46	.0180	39	2.53	.0995	15/64	5.94	.2344	33/64	13.10	.5156
---	0.50	.0197	38	2.58	.1015	---	6.00	.2362	17/32	13.46	.5312
76	0.51	.0200	37	2.64	.1040	B	6.05	.2380	35/64	13.89	.5469
75	0.53	.0210	36	2.71	.1065	C	6.15	.2420	---	14.00	.5512
74	0.57	.0225	7/64	2.78	.1094	D	6.25	.2460	9/16	14.29	.5625
---	0.60	.0236	35	2.79	.1100	1/4	6.35	.2500	37/64	14.68	.5781
73	0.61	.0240	34	2.82	.1110	E	6.35	.2500	---	15.00	.5906
72	0.64	.0250	33	2.87	.1130	F	6.53	.2570	19/32	15.08	.5938
71	0.66	.0260	32	2.95	.1160	G	6.63	.2610	39/64	15.48	.6094
---	0.70	.0276	---	3.00	.1181	17/64	6.75	.2656	5/8	15.88	.6250
70	0.71	.0280	31	3.05	.1200	H	6.76	.2660	---	16.00	.6299
69	0.74	.0292	1/8	3.18	.1250	I	6.91	.2720	41/64	16.37	.6406
---	0.75	.0295	30	3.26	.1285	---	7.00	.2756	21/32	16.67	.6562
68	0.79	.0310	29	3.45	.1360	J	7.04	.2770	---	17.00	.6693
1/32	0.79	.0313	28	3.57	.1405	K	7.14	.2810	43/64	17.07	.6719
---	0.80	.0315	9/64	3.57	.1406	9/32	7.14	.2812	11/16	17.46	.6875
67	0.81	.0320	27	3.66	.1440	L	7.37	.2900	45/64	17.86	.7031
66	0.84	.0330	26	3.73	.1470	M	7.49	.2950	---	18.00	.7087
65	0.89	.0350	25	3.80	.1495	19/64	7.54	.2969	23/32	18.25	.7188
---	0.90	.0354	24	3.86	.1520	N	7.67	.3020	47/64	18.65	.7344
64	0.91	.0360	23	3.91	.1540	5/16	7.94	.3125	---	19.00	.7480
63	0.94	.0370	5/32	3.97	.1562	---	8.00	.3150	3/4	19.05	.7500
62	0.97	.0380	22	3.99	.1570	O	8.03	.3160	49/64	19.45	.7656
61	0.99	.0390	---	4.00	.1575	P	8.20	.3230	25/32	19.84	.7812
---	1.00	.0394	21	4.04	.1590	21/64	8.33	.3281	---	20.00	.7874
60	1.02	.0400	20	4.09	.1610	Q	8.43	.3320	51/64	20.24	.7969
59	1.04	.0410	19	4.22	.1660	R	8.61	.3390	13/16	20.64	.8125
58	1.07	.0420	18	4.31	.1695	11/32	8.73	.3438	---	21.00	.8269
57	1.09	.0430	11/64	4.37	.1719	S	8.84	.3480	53/64	21.03	.8281
56	1.18	.0465	17	4.39	.1730	---	9.00	.3543	27/32	21.46	.8438
3-64	1.19	.0469	16	4.50	.1770	T	9.09	.3580	55/64	21.83	.8594
55	1.32	.0520	15	4.57	.1800	23/64	9.13	.3594	---	22.00	.8661
54	1.40	.0550	14	4.62	.1820	U	9.35	.3680	7/8	22.23	.8750
53	1.51	.0595	13	4.70	.1850	3/8	9.53	.3750	57/64	22.62	.8906
1/16	1.59	.0625	3/16	4.76	.1875	V	9.58	.3770	---	23.00	.9055
52	1.61	.0635	12	4.80	.1890	W	9.80	.3860	29/32	23.02	.9062
51	1.70	.0670	11	4.85	.1910	25/64	9.92	.3906	59/64	23.42	.9219
50	1.78	.0700	10	4.91	.1935	---	10.00	.3937	15/16	23.81	.9375
49	1.85	.0730	9	4.98	.1960	X	10.08	.3970	---	24.00	.9449
48	1.95	.0760	---	5.00	.1968	Y	10.26	.4040	61/64	24.21	.9531
5/64	1.98	.0781	8	5.05	.1990	13/32	10.32	.4062	31/32	24.61	.9688
47	1.99	.0785	7	5.11	.2010	Z	10.49	.4130	---	25.00	.9842
---	2.00	.0787	13/64	5.16	.2031	27/64	10.72	.4219	63/64	25.00	.9844

FORMULAE FOR SPEED & FEED CALCULATIONS

Speed	Revolutions / Minute	Chip Volume	Feed / Revolution	Feed / Tooth	Machining Time	Feed / Minute
$v = \frac{\pi D \cdot n}{1000}$	$n = \frac{v \cdot 1000}{\pi D}$	$V = \frac{a \cdot b \cdot S'}{1000}$	$Sn = \frac{S'}{n}$	$Sz = \frac{S'}{n \cdot Z}$	$t = \frac{l}{S'}$	$S' = n \cdot z \cdot Sz$
v = Speed, D = Cutter Diameter, n = Revolutions / Minute, Sn = Feed per Revolution, S' = Feed / Minute, Sz = Feed / Tooth Z = Number of Teeth, V = Chip Volume, a = Depth of Cut, b = Length of Cut, t = Machining Time, l = Length of Workpiece						

CUTTING SPEED

Feet/Minute	30	40	50	60	70	80	90	100	150	200	250
Drill Ø (Inches)	REVOLUTION PER MINUTE										
1/16	1833	2445	3056	3667	4278	4889	5500	6112	9167	12223	15279
1/8	917	1222	1528	1833	2139	2445	2750	3056	4584	6112	6739
3/16	611	815	1019	1222	1426	1630	1833	2037	3056	4076	5093
1/4	458	611	764	927	1070	1222	1375	1528	2292	3056	3820
5/16	367	489	611	733	856	978	1100	1222	1833	2445	3056
3/8	306	407	509	611	713	815	917	1019	1528	2037	2546
7/16	262	349	437	524	611	698	786	873	1310	1746	2183
1/2	229	306	382	458	535	611	688	764	1146	1528	1910
5/8	183	244	306	367	428	489	550	611	917	1222	1528
3/4	153	204	255	306	357	407	458	509	764	1019	1273
7/8	131	175	218	262	306	349	393	473	655	873	1091
1	115	153	191	229	267	306	344	382	573	764	955
1.1/8	102	136	170	204	238	272	306	340	509	679	849
1.1/4	92	122	153	193	214	244	275	306	458	611	764
1.3/8	83	111	139	167	194	222	250	278	417	556	694
1.1/2	76	102	127	153	178	204	229	255	382	509	637
1.5/8	71	94	118	141	165	188	212	235	353	470	588
1.3/4	66	87	109	131	153	175	196	218	327	437	546
1.7/8	61	82	102	122	143	163	183	204	306	407	509
2	57	76	96	115	134	153	172	191	287	382	477
2.1/4	51	68	85	102	119	136	153	170	255	340	424
2.1/2	46	61	76	92	107	122	138	153	229	306	382
2.3/4	42	56	70	83	97	111	125	139	208	278	347
3	38	51	64	76	89	102	115	127	191	255	318
3.1/4	35	47	59	71	82	94	106	118	176	235	294
3.1/2	33	44	55	66	76	87	98	109	164	218	273
3.3/4	31	41	51	61	71	81	92	102	153	204	255

TAP DRILL SIZES

UNIFIED NATIONAL THREADS - 60° Included Angle

NOMINAL DIAMETER	UNC		UNF		NPT & TPS		
Fractional (Inches)	TPI	Drill Size (mm)	TPI	Drill Size (mm)	TPI	Drill Size (mm)	Drill Size (mm)
1/16	---	---	---	---	27	6.00	6.30
3/32	---	---	---	---	---	---	---
1/8	---	---	---	---	27	8.40	8.70
5/32	---	---	---	---	---	---	---
3/16	---	---	---	---	---	---	---
7/32	---	---	---	---	---	---	---
1/4	20	5.10	28	5.50	18	10.70	11.10
5/16	18	6.60	24	6.90	---	---	---
3/8	16	8.00	24	8.50	18	14.25	14.50
7/16	14	9.40	20	9.90	---	---	---
1/2	13	10.80	20	11.50	14	17.50	18.00
9/16	12	12.20	18	12.90	---	---	---
5/8	11	13.50	18	14.50	---	---	---
11/16	---	---	---	---	---	---	---
3/4	10	16.50	16	17.50	14	22.75	23.25
13/16	---	---	---	---	---	---	---
7/8	9	19.50	14	20.40	---	---	---
15/16	---	---	---	---	---	---	---
1	8	22.25	12	23.25	11.50	28.50	29.00
1.1/8	7	25.00	12	26.50	---	---	---
1.1/4	7	28.00	12	29.50	11.50	37.50	38.00
1.3/8	6	30.75	12	32.75	---	---	---
1.1/2	6	34.00	12	36.00	11.50	43.50	44.00
1.5/8	---	---	---	---	---	---	---
1.3/4	5	39.50	---	---	---	---	---
1.7/8	---	---	---	---	---	---	---
2	---	---	---	---	11.50	55.00	56.00