

Engineering Tables/Standard Wire Gauge

Standard Wire Gauge	Diameter		Turns of wire		Cross-sectional area		Res. per length (for copper wire)		Mass per length		Current Capacity / A	
	in	mm	in ⁻¹	mm ⁻¹	kcmil	mm ²	Ω/kft	Ω/km	lb/ft	kg/m	750 kcmil/A	500kcmil/A
0000000 (7/0)	0.500	12.7	2.00	0.0787	250	127	0.136	0.447	0.759	1.13	333	500
000000 (6/0)	0.464	11.8	2.16	0.0848	215	109	0.158	0.519	0.654	0.973	287	431
00000 (5/0)	0.432	11.0	2.31	0.0911	187	94.6	0.182	0.598	0.567	0.844	249	373
0000 (4/0)	0.400	10.2	2.50	0.0984	160	81.1	0.213	0.698	0.486	0.723	213	320
000 (3/0)	0.372	9.45	2.69	0.106	138	70.1	0.246	0.807	0.420	0.625	185	277
00 (2/0)	0.348	8.84	2.87	0.113	121	61.4	0.281	0.922	0.368	0.547	161	242
0 (1/0)	0.324	8.23	3.09	0.122	105	53.2	0.324	1.06	0.319	0.474	140	210
1	0.300	7.62	3.33	0.131	90.0	45.6	0.378	1.24	0.273	0.407	120	180
2	0.276	7.01	3.62	0.143	76.2	38.6	0.447	1.47	0.231	0.344	102	152
3	0.252	6.40	3.97	0.156	63.5	32.2	0.536	1.76	0.193	0.287	84.7	127
4	0.232	5.89	4.31	0.170	53.8	27.3	0.632	2.07	0.163	0.243	71.8	108
5	0.212	5.38	4.72	0.186	44.9	22.8	0.757	2.48	0.137	0.203	59.9	89.9
6	0.192	4.88	5.21	0.205	36.9	18.7	0.923	3.03	0.112	0.167	49.2	73.7
7	0.176	4.47	5.68	0.224	31.0	15.7	1.10	3.60	0.0941	0.140	41.3	62.0
8	0.160	4.06	6.25	0.246	25.6	13.0	1.33	4.36	0.0778	0.116	34.1	51.2
9	0.144	3.66	6.94	0.273	20.7	10.5	1.64	5.38	0.0630	0.0937	27.6	41.5
10	0.128	3.25	7.81	0.308	16.4	8.30	2.08	6.81	0.0498	0.0741	21.8	32.8
11	0.116	2.95	8.62	0.339	13.5	6.82	2.53	8.30	0.0409	0.0608	17.9	26.9

12	0.104	2.64	9.62	0.379	10.8	5.48	3.15	10.3	0.0329	0.0489	14.4	21.6
13	0.0920	2.34	10.9	0.428	8.46	4.29	4.02	13.2	0.0257	0.0383	11.3	16.9
14	0.0800	2.03	12.5	0.492	6.40	3.24	5.32	17.4	0.0194	0.0289	8.53	12.8
15	0.0720	1.83	13.9	0.547	5.18	2.63	6.56	21.5	0.0157	0.0234	6.91	10.4
16	0.0640	1.63	15.6	0.615	4.10	2.08	8.31	27.3	0.0124	0.0185	5.46	8.19
17	0.0560	1.42	17.9	0.703	3.14	1.59	10.9	35.6	0.00952	0.0142	4.18	6.27
18	0.0480	1.22	20.8	0.820	2.30	1.17	14.8	48.5	0.00700	0.0104	3.07	4.61
19	0.0400	1.02	25.0	0.984	1.60	0.811	21.3	69.8	0.00486	0.00723	2.13	3.20
20	0.0360	0.914	27.8	1.09	1.30	0.657	26.3	86.1	0.00394	0.00586	1.73	2.59
21	0.0320	0.813	31.3	1.23	1.02	0.519	33.2	109	0.00311	0.00463	1.37	2.05
22	0.0280	0.711	35.7	1.41	0.784	0.397	43.4	142	0.00238	0.00354	1.05	1.57
23	0.0240	0.610	41.7	1.64	0.576	0.292	59.1	194	0.00175	0.00260	0.768	1.15
24	0.0220	0.559	45.5	1.79	0.484	0.245	70.3	231	0.00147	0.00219	0.645	0.968
25	0.0200	0.508	50.0	1.97	0.400	0.203	85.1	279	0.00121	0.00181	0.533	0.800
26	0.0180	0.457	55.6	2.19	0.324	0.164	105	345	984μ	0.00146	0.432	0.648
27	0.0164	0.417	61.0	2.40	0.269	0.136	127	415	817μ	0.00122	0.359	0.538
28	0.0148	0.376	67.6	2.66	0.219	0.111	155	510	665μ	990μ	0.292	0.438
29	0.0136	0.345	73.5	2.89	0.185	0.0937	184	604	562μ	836μ	0.247	0.370
30	0.0124	0.315	80.6	3.18	0.154	0.0779	221	726	467μ	695μ	0.205	0.308
31	0.0116	0.295	86.2	3.39	0.135	0.0682	253	830	409μ	608μ	0.179	0.269
32	0.0108	0.274	92.6	3.65	0.117	0.0591	292	957	354μ	527μ	0.156	0.233
33	0.0100	0.254	100	3.94	0.100	0.0507	340	1120	304μ	452μ	0.133	0.200
34	0.00920	0.234	109	4.28	0.0846	0.0429	402	1320	257μ	383μ	0.113	0.169
35	0.00840	0.213	119	4.69	0.0706	0.0358	482	1580	214μ	319μ	0.0941	0.141

36	0.00760	0.193	132	5.18	0.0578	0.0293	589	1930	175μ	261μ	0.0770	0.116
37	0.00680	0.173	147	5.79	0.0462	0.0234	736	2410	140μ	209μ	0.0617	0.0925
38	0.00600	0.152	167	6.56	0.0360	0.0182	945	3100	109μ	163μ	0.0480	0.0720
39	0.00520	0.132	192	7.57	0.0270	0.0137	1260	4130	82.1μ	122μ	0.0361	0.0541
40	0.00480	0.122	208	8.20	0.0230	0.0117	1480	4850	70.0μ	104μ	0.0307	0.0461
41	0.00440	0.112	227	8.95	0.0194	0.00981	1760	5770	58.8μ	87.5μ	0.0258	0.0387
42	0.00400	0.102	250	9.84	0.0160	0.00811	2130	6980	48.6μ	72.3μ	0.0213	0.0320
43	0.00360	0.0914	278	10.9	0.0130	0.00657	2630	8610	39.4μ	58.6μ	0.0173	0.0259
44	0.00320	0.0813	313	12.3	0.0102	0.00519	3320	10900	31.1μ	46.3μ	0.0137	0.0205
45	0.00280	0.0711	357	14.1	0.00784	0.00397	4340	14200	23.8μ	35.4μ	0.0105	0.0157
46	0.00240	0.0610	417	16.4	0.00576	0.00292	5910	19400	17.5μ	26.0μ	0.00768	0.0115
47	0.00200	0.0508	500	19.7	0.00400	0.00203	8510	27900	12.1μ	18.1μ	0.00533	0.00800
48	0.00160	0.0406	625	24.6	0.00256	0.00130	13300	43600	7.78μ	11.6μ	0.00341	0.00512
49	0.00120	0.0305	833	32.8	0.00144	730μ	23600	77500	4.37μ	6.51μ	0.00192	0.00288
50	0.00100	0.0254	1000	39.4	0.00100	507μ	34000	112000	3.04μ	4.52μ	0.00133	0.00200

Notes:

1. All values are rounded to three significant figures. Values less than 1×10^{-6} are shown with appropriate SI prefixes to avoid a large number of leading zeros.
2. The IACS value of 58.0 MS/m is used as the conductivity of copper.
3. These calculations do *not* take into account AC effects such as the skin effect - perform suitable calculations before using in a high-frequency application. Grid mains frequencies (50-60 Hz) should not have a noticeable effect, as the skin depth is over 8mm.
4. A density of copper of 8920 kg/m³ is used to derive the mass
5. An allowance of 750 kcmil/A is generally sufficient for calculating current capacity. The more relaxed 500 kcmil/A is an absolute maximum.
6. The values are guidelines – exact values will depend on the type of wire and operating conditions such as ambient temperature, thermal conductivity of the surroundings.