

## Solid Copper Wire & Magnet Wire Data by AWG (4/0 to 24)

AWG	Bare Diameter		Bare Area		DC Resistance		Maximum Current <sup>1</sup>	Maximum Frequency <sup>2</sup>	Single Build Diameter		Heavy Build Diameter	
	in	mm	circ. mils	mm <sup>2</sup>	Ω/1000 ft	Ω/km			in	mm	in	mm
0000 (4/0)	0.4600	11.684	211.2 kcmil	107.0	0.0490	0.1607	302 A	125 Hz	—	—	—	—
000 (3/0)	0.4096	10.404	167.7 kcmil	85.0	0.0618	0.2027	239 A	160 Hz	—	—	—	—
00 (2/0)	0.3648	9.266	133.0 kcmil	67.4	0.0779	0.2555	190 A	200 Hz	—	—	—	—
0 (1/0)	0.3249	8.252	105.6 kcmil	53.5	0.0983	0.3224	150 A	250 Hz	—	—	—	—
1	0.2893	7.348	83.68 kcmil	42.4	0.1239	0.4064	119 A	325 Hz	—	—	—	—
2	0.2576	6.543	66.31 kcmil	33.6	0.1563	0.5127	94 A	410 Hz	—	—	0.2611	6.632
3	0.2294	5.827	52.69 kcmil	26.7	0.1970	0.6462	75 A	500 Hz	—	—	0.2330	5.918
4	0.2043	5.189	41.84 kcmil	21.2	0.2485	0.8151	60 A	650 Hz	—	—	0.2079	5.281
5	0.1819	4.620	33.16 kcmil	16.8	0.3133	1.0276	47 A	810 Hz	—	—	0.1856	4.714
6	0.1620	4.115	26.25 kcmil	13.3	0.3951	1.2959	37 A	1.10 kHz	0.1648	4.186	0.1656	4.206
7	0.1443	3.665	20.72 kcmil	10.5	0.4982	1.6341	30 A	1.30 kHz	0.1469	3.731	0.1478	3.754
8	0.1285	3.264	16.52 kcmil	8.37	0.6282	2.0605	24 A	1.65 kHz	0.1302	3.307	0.1320	3.353
9	0.1144	2.906	13.08 kcmil	6.63	0.7921	2.5981	19 A	2.05 kHz	0.1162	2.951	0.1179	2.995
10	0.1019	2.588	10.38 kcmil	5.26	0.9989	3.2764	15 A	2.60 kHz	0.1037	2.634	0.1054	2.677
11	0.0907	2.304	8.230 kcmil	4.17	1.260	4.1328	12 A	3.20 kHz	0.0925	2.350	0.0942	2.393
12	0.0808	2.052	6.532 kcmil	3.31	1.588	5.2086	9.3 A	4.15 kHz	0.0825	2.096	0.0842	2.139
13	0.0720	1.829	5.171 kcmil	2.62	2.003	6.5698	7.4 A	5.30 kHz	0.0737	1.872	0.0754	1.915
14	<b>0.0641</b>	<b>1.628</b>	4.105 kcmil	2.08	2.525	8.2820	5.9 A	6.70 kHz	<b>0.0659</b>	<b>1.674</b>	<b>0.0675</b>	<b>1.715</b>
15	0.0571	1.450	3.256 kcmil	1.65	3.184	10.444	4.7 A	8.25 kHz	<b>0.0587</b>	<b>1.491</b>	<b>0.0603</b>	<b>1.532</b>
16	<b>0.0508</b>	<b>1.290</b>	2.585 kcmil	1.31	4.016	13.172	3.7 A	11 kHz	<b>0.0524</b>	<b>1.331</b>	<b>0.0539</b>	<b>1.369</b>
17	0.0453	1.151	2.052 kcmil	1.04	5.064	16.610	2.9 A	13 kHz	<b>0.0469</b>	<b>1.191</b>	<b>0.0482</b>	<b>1.224</b>
18	<b>0.0403</b>	<b>1.024</b>	1.624 kcmil	0.823	6.385	20.943	2.3 A	17 kHz	<b>0.0418</b>	<b>1.062</b>	<b>0.0431</b>	<b>1.095</b>
19	0.0359	0.912	1.289 kcmil	0.653	8.051	26.407	1.8 A	21 kHz	<b>0.0373</b>	<b>0.947</b>	<b>0.0386</b>	<b>0.980</b>
20	<b>0.0320</b>	<b>0.813</b>	1.022 kcmil	0.518	10.15	33.292	1.5 A	27 kHz	<b>0.0335</b>	<b>0.851</b>	<b>0.0346</b>	<b>0.879</b>
21	0.0285	0.724	809.1 cmil	0.410	12.80	41.984	1.2 A	33 kHz	<b>0.0298</b>	<b>0.757</b>	<b>0.0310</b>	<b>0.787</b>
22	<b>0.0254</b>	<b>0.645</b>	643.4 cmil	0.326	16.14	52.939	920 mA	42 kHz	<b>0.0266</b>	<b>0.676</b>	<b>0.0276</b>	<b>0.701</b>
23	0.0226	0.574	509.2 cmil	0.258	20.36	66.781	729 mA	53 kHz	<b>0.0239</b>	<b>0.607</b>	<b>0.0249</b>	<b>0.632</b>
24	<b>0.0201</b>	<b>0.511</b>	404.6 cmil	0.205	25.67	84.198	577 mA	68 kHz	<b>0.0213</b>	<b>0.541</b>	<b>0.0223</b>	<b>0.566</b>

<sup>1</sup> **Maximum Current:** These ampacities are based on a very moderate rating of 700 circular mils per amp (cma). Determining a more accurate current rating depends on a variety of factors including the surrounding materials, permissible temperature rise, and specific usage of the wire. When applicable, consult your local electrical code to determine what parameters are legal.

<sup>2</sup> **Maximum Frequency:** These are the highest frequencies where you can still achieve 100% skin depth (i.e. no skin effect). Skin effect is the tendency of AC currents to distribute near the surface of a conductor, which reduces the effective utilized conductor area and increases the effective resistance. If you operate above the maximum frequency, you should start to account for the skin effect when considering the conductor's resistance.

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## Solid Copper Wire & Magnet Wire Data by AWG (25 to 50)

AWG	Bare Diameter		Bare Area		DC Resistance		Maximum Current <sup>1</sup>	Maximum Frequency <sup>2</sup>	Single Build Diameter		Heavy Build Diameter	
	in	mm	circ. mils	mm <sup>2</sup>	Ω/1000 ft	Ω/km			in	mm	in	mm
25	0.0179	0.455	319.7 cmil	0.162	32.37	106.17	457 mA	85 kHz	<b>0.0190</b>	<b>0.483</b>	<b>0.0199</b>	<b>0.505</b>
26	<b>0.0159</b>	<b>0.404</b>	254.6 cmil	0.129	40.81	133.86	361 mA	107 kHz	<b>0.0170</b>	<b>0.432</b>	<b>0.0178</b>	<b>0.452</b>
27	0.0142	0.361	201.3 cmil	0.102	51.47	168.82	288 mA	130 kHz	<b>0.0153</b>	<b>0.389</b>	<b>0.0161</b>	<b>0.409</b>
28	<b>0.0126</b>	<b>0.320</b>	159.9 cmil	0.081	64.90	212.87	226 mA	170 kHz	<b>0.0137</b>	<b>0.348</b>	<b>0.0144</b>	<b>0.366</b>
29	0.0113	0.287	126.7 cmil	0.064	81.83	268.40	182 mA	210 kHz	<b>0.0123</b>	<b>0.312</b>	<b>0.0130</b>	<b>0.330</b>
30	<b>0.0100</b>	<b>0.254</b>	100.5 cmil	0.051	103.2	338.50	142 mA	270 kHz	<b>0.0109</b>	<b>0.277</b>	<b>0.0117</b>	<b>0.297</b>
31	0.0089	0.226	79.73 cmil	0.040	130.1	426.73	113 mA	340 kHz	<b>0.0097</b>	<b>0.246</b>	<b>0.0104</b>	<b>0.264</b>
32	<b>0.0080</b>	<b>0.203</b>	63.15 cmil	0.032	164.1	538.25	91.0 mA	430 kHz	<b>0.0088</b>	<b>0.224</b>	<b>0.0094</b>	<b>0.239</b>
33	0.0071	0.180	50.13 cmil	0.025	206.9	678.63	72.0 mA	540 kHz	<b>0.0078</b>	<b>0.198</b>	<b>0.0084</b>	<b>0.213</b>
34	0.0063	0.160	39.67 cmil	0.020	260.9	855.75	56.0 mA	690 kHz	<b>0.0070</b>	<b>0.178</b>	<b>0.0075</b>	<b>0.191</b>
35	0.0056	0.142	31.58 cmil	0.016	329.0	1079.1	44.0 mA	870 kHz	<b>0.0062</b>	<b>0.157</b>	<b>0.0067</b>	<b>0.170</b>
36	0.0050	0.127	25.06 cmil	0.013	414.8	1360.0	35.0 mA	1.10 MHz	<b>0.0056</b>	<b>0.142</b>	<b>0.0060</b>	<b>0.152</b>
37	0.0045	0.114	19.74 cmil	0.010	523.1	1715.0	28.9 mA	1.35 MHz	<b>0.0050</b>	<b>0.127</b>	<b>0.0054</b>	<b>0.137</b>
38	0.0040	0.102	15.73 cmil	0.0080	659.6	2163.0	22.8 mA	1.75 MHz	<b>0.0045</b>	<b>0.114</b>	<b>0.0048</b>	<b>0.122</b>
39	0.0035	0.0889	12.47 cmil	0.0063	831.8	2728.0	17.5 mA	2.25 MHz	<b>0.0040</b>	<b>0.102</b>	<b>0.0042</b>	<b>0.107</b>
40	0.0031	0.0787	9.887 cmil	0.0050	1049	3440.0	13.7 mA	2.90 MHz	<b>0.0035</b>	<b>0.0889</b>	<b>0.0038</b>	<b>0.0965</b>
41	0.0028	0.0711	7.835 cmil	0.0040	1316	4317.0	11.2 mA	3.35 MHz	<b>0.0032</b>	<b>0.0813</b>	<b>0.0035</b>	<b>0.0889</b>
42	0.0025	0.0635	6.256 cmil	0.0032	1652	5421.0	8.9 mA	4.20 MHz	<b>0.0028</b>	<b>0.0711</b>	<b>0.0031</b>	<b>0.0787</b>
43	0.0022	0.0559	4.835 cmil	0.0025	2137	7011.0	6.9 mA	5.50 MHz	<b>0.0025</b>	<b>0.0635</b>	0.0027	0.0686
44	0.0020	0.0508	4.006 cmil	0.0020	2589	8495.0	5.7 mA	6.55 MHz	<b>0.0023</b>	<b>0.0584</b>	0.0024	0.0610
45	0.00176	0.0447	3.098 cmil	0.0016	3348	10864	4.4 mA	8.50 MHz	0.00205	0.0521	0.00225	0.0572
46	0.00157	0.0399	2.467 cmil	0.0013	4207	13802	3.5 mA	10.7 MHz	0.00173	0.0439	0.00196	0.0498
47	0.00140	0.0356	1.954 cmil	0.0010	5291	17359	2.8 mA	13.4 MHz	0.00157	0.0399	0.00177	0.0450
48	0.00124	0.0315	1.539 cmil	0.0008	6745	22129	2.2 mA	17.1 MHz	0.00140	0.0356	0.00155	0.0394
49	0.00111	0.0282	1.224 cmil	0.00062	8417	27615	1.7 mA	21.4 MHz	0.00124	0.0315	0.00139	0.0353
50	0.00099	0.0252	0.987 cmil	0.00050	10580	34711	1.4 mA	26.9 MHz	0.00113	0.0287	0.00128	0.0325

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