

# American Wire Gauge (AWG) & Metric Wire Gauge Wire Sizes

## AWG Wire Sizes (see table below)

AWG: In the American Wire Gauge (AWG), diameters can be calculated by applying the formula:  $D(\text{AWG}) = 0.005 \cdot 92^{((36-\text{AWG})/39)}$  inch. For the 00, 000, 0000 etc. gauges you use -1, -2, -3, which makes more sense mathematically than "double nought." This means that in American Wire Gauge every 6 gauge decrease gives a doubling of the wire diameter, and every 3 gauge decrease doubles the wire cross sectional area. Just like dB in signal levels.

## Metric Wire Gauges (see table below)

Metric Gauge: In the Metric Gauge scale, the gauge is 10 times the diameter in millimeters, thus a 50 gauge metric wire would be 5 mm in diameter. Note that in AWG the diameter goes up as the gauge goes down; metric is the opposite. Probably because of this confusion, most of the time metric sized wire is specified in millimeters rather than metric gauges.

## Load Carrying Capacities (see table below)

The following chart is a guideline of "ampacity", or copper wire current carrying capacity following the *Handbook of Electronic Tables and Formulas* for American Wire Gauge. As you might guess, the rated "ampacities" are just a rule of thumb. In careful engineering the insulation temperature limit, thickness, thermal conductivity, and air convection and temperature should all be taken into account. The Maximum Amps for Power Transmission uses the 700 circular mils per amp rule, which is very conservative. The Maximum Amps for Chassis Wiring is also a conservative rating, but is meant for wiring in air, and not in a bundle. For short lengths of wire, such as is used in battery packs you should trade off the resistance and load with size, weight, and flexibility.

**Table 1: AWG and MM Comptable**

AWG	外径		截面积 (mm <sup>2</sup> )	电阻值 (Ω/km)	正常电流 (A)	最大电流 (A)	AWG	外径		截面积 (mm <sup>2</sup> )	电阻值 (Ω/km)	正常电流 (A)	最大电流 (A)
	公制mm	英制inch						公制mm	英制inch				
0000	11.68	0.46	107.22	0.17	423.2	482.6	22	0.643	0.0253	0.3247	54.3	1.280	1.460
000	10.4	0.4096	85.01	0.21	335.5	382.6	23	0.574	0.0226	0.2588	48.5	1.022	1.165
00	9.27	0.3648	67.43	0.26	266.2	303.5	24	0.511	0.0201	0.2047	89.4	0.808	0.921
0	8.25	0.3249	53.49	0.33	211.1	240.7	25	0.44	0.0179	0.1624	79.6	0.641	0.731
1	7.35	0.2893	42.41	0.42	167.4	190.9	26	0.404	0.0159	0.1281	143	0.506	0.577
2	6.54	0.2576	33.62	0.53	132.7	151.3	27	0.361	0.0142	0.1021	128	0.403	0.460
3	5.83	0.2294	26.67	0.66	105.2	120.0	28	0.32	0.0126	0.0804	227	0.318	0.362
4	5.19	0.2043	21.15	0.84	83.5	95.2	29	0.287	0.0113	0.0647	289	0.255	0.291
5	4.62	0.1819	16.77	1.06	66.2	75.5	30	0.254	0.01	0.0507	361	0.200	0.228
6	4.11	0.162	13.3	1.33	52.5	59.9	31	0.226	0.0089	0.0401	321	0.158	0.181
7	3.67	0.1443	10.55	1.68	41.6	47.5	32	0.203	0.008	0.0316	583	0.128	0.146
8	3.26	0.1285	8.37	2.11	33.0	37.7	33	0.18	0.0071	0.0255	944	0.101	0.115
9	2.91	0.1144	6.63	2.67	26.2	29.8	34	0.16	0.0063	0.0201	956	0.079	0.091
10	2.59	0.1019	5.26	3.36	20.8	23.7	35	0.142	0.0056	0.0169	1200	0.063	0.072
11	2.3	0.0907	4.17	4.24	16.5	18.8	36	0.127	0.005	0.0127	1530	0.050	0.057
12	2.05	0.0808	3.332	5.31	13.1	14.9	37	0.114	0.0045	0.0098	1377	0.041	0.046
13	1.82	0.072	2.627	6.69	10.4	11.8	38	0.102	0.004	0.0081	2400	0.032	0.036
14	1.63	0.0641	2.075	8.45	8.2	9.4	39	0.089	0.0035	0.0062	2100	0.025	0.028
15	1.45	0.0571	1.646	10.6	6.5	7.4	40	0.079	0.0031	0.0049	4080	0.019	0.022
16	1.29	0.0508	1.318	13.5	5.2	5.9	41	0.071	0.0028	0.004	3685	0.016	0.018
17	1.15	0.0453	1.026	16.3	4.1	4.7	42	0.064	0.0025	0.0032	6300	0.013	0.014
18	1.02	0.0403	0.8107	21.4	3.2	3.7	43	0.056	0.0022	0.0025	5544	0.010	0.011
19	0.912	0.0359	0.5667	26.9	2.6	2.9	44	0.051	0.002	0.002	10200	0.008	0.009
20	0.813	0.032	0.5189	33.9	2.0	2.3	45	0.046	0.0018	0.0016	9180	0.006	0.007
21	0.724	0.0285	0.4116	42.7	1.6	1.9	46	0.041	0.0016	0.0013	16300	0.005	0.006

$$D_m = 92 \frac{36 - \text{AWG}}{39} \times 0.127$$

$$D_i^2 / 500$$

$$D_i^2 / 438.489$$

Di=1000外径英制inch

近似类比：(依次为 1/3 的关系)

1 AWG=7.5mm

10 AWG=2.5mm

20 AWG=0.8mm

30 AWG=0.20mm

只用记住 10 号线规为 2.5mm

AWM=Appliance Wiring Material

AWG=American Wring Gauge.

NO.28 一般也寫成 28AWG,芯線的構成常用二種方式:

1. 0.322/1

2. 0.127/7.也寫成 36AWG/7.

Manufacture [Crimping Tools](#), [Wire Stripper](#), [Cable Cutter](#) and [Hydraulic Tools](#).

Design by Fivestar Tools Co., Ltd