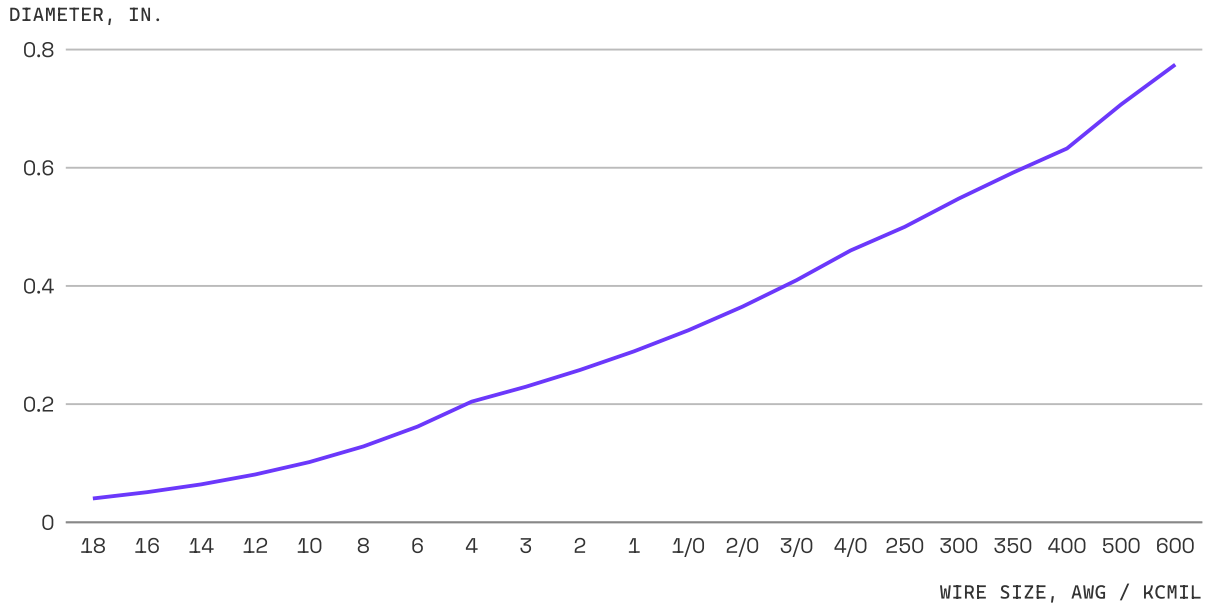
AWG chart

12 AWG wire is 0.0808 in. (2.05 mm) across and has an area of 6,530 circular mils. Every three gauge numbers smaller, the area of an AWG wire roughly doubles.

AWG wire sizes: diameter in inches and millimeters, area in circular mils and square millimeters, and copper and aluminum resistance per 1,000 ft

SIZE	DIAMETER, IN.	DIAMETER, MM	AREA, CMIL	AREA, MM²	COPPER, Ω PER 1,000 FT	ALUMINUM, Ω PER 1,000 FT
18 AWG	0.0403	1.02	1,620	0.823	7.9630	—
16 AWG	0.0508	1.29	2,580	1.31	5.0000	—
14 AWG	0.0641	1.63	4,110	2.08	3.1387	—
12 AWG	0.0808	2.05	6,530	3.31	1.9755	3.2466
10 AWG	0.1019	2.59	10,380	5.26	1.2428	2.0424
8 AWG	0.1285	3.26	16,510	8.37	0.7813	1.2841
6 AWG	0.1620	4.12	26,240	13.3	0.4916	0.8079
4 AWG	0.2043	5.19	41,740	21.2	0.3091	0.5079
3 AWG	0.2294	5.83	52,620	26.7	0.2452	0.4029
2 AWG	0.2576	6.54	66,360	33.6	0.1944	0.3195
1 AWG	0.2893	7.35	83,690	42.4	0.1541	0.2533
1/0 AWG	0.3249	8.25	105,600	53.5	0.1222	0.2008
2/0 AWG	0.3648	9.27	133,100	67.4	0.0969	0.1593
3/0 AWG	0.4096	10.40	167,800	85	0.0769	0.1263
4/0 AWG	0.4600	11.68	211,600	107.2	0.0610	0.1002
250 kcmil	0.5000	12.70	250,000	127	0.0516	0.0848
300 kcmil	0.5477	13.91	300,000	152	0.0430	0.0707
350 kcmil	0.5916	15.03	350,000	177	0.0369	0.0606

SIZE	DIAMETER, IN.	DIAMETER, MM	AREA, CMIL	AREA, MM²	COPPER, Ω PER 1,000 FT	ALUMINUM, Ω PER 1,000 FT
400 kcmil	0.6325	16.06	400,000	203	0.0323	0.0530
500 kcmil	0.7071	17.96	500,000	253	0.0258	0.0424
600 kcmil	0.7746	19.67	600,000	304	0.0215	0.0353



Conductor diameter by wire size.

How the AWG sizes are calculated

AWG diameters follow the formula d = 0.005 in. × 92^((36 − n) ÷ 39), where n is the gauge number and 1/0, 2/0, 3/0, 4/0 count as 0, −1, −2 and −3. Diameters are for a solid conductor; stranded wire of the same gauge is slightly larger. kcmil sizes are defined by area, and their diameter here is that of a solid conductor of the same area.

Resistance uses the same constants as the voltage-drop calculations on this site: 12.9 Ω·cmil/ft for copper and 21.2 for aluminum, which correspond to a conductor at operating temperature.

SOURCES

- ASTM B258, Standard Specification for Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes: American Wire Gauge diameter formula, d = 0.005 in × 92^((36 − n) / 39)
- NFPA 70, National Electrical Code (2023): Conductor properties, Chapter 9 Table 8

▶ Compared with 2 published documents, last on 2026-11-13

Calculated by Calculate.diy with the method of the National Electrical Code® (NEC®), 2023 edition; not the NEC text. Methodology. For planning only: check local code and use a licensed electrician.