

Wire Sizes and Resistance

The resistance of a length of wire is described by

$$R = \frac{l}{a}$$

where ρ = resistivity of copper; 10.371 Ω /cir. mil-ft

l = length of the wire

a = cross sectional area of the wire in cir. mil

For Solid Wire

Gauge	Dia. mils	Cross Section cir mil	ρ /1000'
16.00	51.00	2580.00	4.10
18.00	40.00	1620.00	6.53
20.00	32.00	1020.00	10.37
22.00	25.30	642.00	16.47
24.00	20.10	404.00	26.17
26.00	15.90	254.00	41.62
28.00	12.60	160.00	66.08
30.00	10.00	101.00	104.68
32.00	8.00	63.20	167.29
34.00	6.30	39.50	267.66
36.00	5.00	25.00	422.91
38.00	4.00	15.70	673.42
40.00	3.00	9.91	1066.87

Typical Stranded Wire

Gauge	cond/strand	Cross Section cir mil	ρ /1000'
16.00	26/30	2626.00	4.03
18.00	16/30	1616.00	6.54
20.00	10/30	1010.00	10.47
22.00	7/30	707.00	14.95
24.00	7/32	442.40	23.90
26.00	7/34	276.50	38.24
28.00	7/36	175.00	60.42