# Electrical Resistance

The limits of electrical resistance are derived from the calculations made in IEC standard 317-0-1 Annex C.1 “Method for the calculation of linear resistance” for copper wire and are restricted by a factor of 2.

| Nom. Diameter [mm] | AWG | Min [Ω/m] | Nominal [Ω/m] | Max [Ω/m] |
|---|---|---|---|---|
| 0.0098 | 58 | 629.7 | 662.9 | 696.0 |
| 0.0101 | | 592.9 | 624.1 | 655.3 |
| 0.0109 | 57 | 509.0 | 535.8 | 562.6 |
| 0.0113 | | 473.6 | 498.6 | 523.5 |
| 0.0120 | | 420.0 | 442.1 | 464.2 |
| 0.0125 | 56 | 387.1 | 407.4 | 427.8 |
| 0.0130 | 55.5 | 357.9 | 376.7 | 395.5 |
| 0.0135 | 55 | 331.8 | 349.3 | 366.8 |
| 0.0140 | | 308.6 | 324.8 | 341.0 |
| 0.0145 | 54.5 | 287.7 | 302.8 | 317.9 |
| 0.0155 | 54 | 251.7 | 265.0 | 278.2 |
| 0.0160 | | 236.2 | 248.7 | 261.1 |
| 0.0165 | 53.5 | 222.1 | 233.8 | 245.5 |
| 0.0170 | | 209.3 | 220.3 | 231.3 |
| 0.0175 | 53 | 197.5 | 207.9 | 218.3 |
| 0.0180 | | 186.7 | 196.5 | 206.3 |
| 0.0185 | 52.5 | 176.7 | 186.0 | 195.3 |
| 0.0190 | | 167.5 | 176.3 | 185.2 |
| 0.0195 | 52 | 159.1 | 167.4 | 175.8 |
| 0.0200 | | 151.2 | 159.2 | 167.1 |
| 0.0210 | 51.5 | 137.1 | 144.4 | 151.6 |
| 0.0215 | | 130.8 | 137.7 | 144.6 |
| 0.0220 | 51 | 125.0 | 131.5 | 138.1 |
| 0.0230 | 50.5 | 114.3 | 120.3 | 126.4 |
| 0.0240 | | 105.0 | 110.5 | 116.1 |
| 0.0245 | 50 | 100.8 | 106.1 | 111.4 |
| 0.0250 | | 96.77 | 101.9 | 107.0 |
| 0.0260 | 49.5 | 89.47 | 94.17 | 98.88 |
| 0.0270 | | 82.96 | 87.33 | 91.69 |
| 0.0275 | 49 | 79.97 | 84.18 | 88.39 |
| 0.0280 | | 77.14 | 81.20 | 85.26 |
| 0.0290 | 48.5 | 71.91 | 75.70 | 79.48 |
| 0.0300 | | 67.20 | 70.74 | 74.27 |
| 0.0310 | 48 | 62.93 | 66.25 | 69.56 |
| 0.0320 | | 59.06 | 62.17 | 65.28 |
| 0.0330 | 47.5 | 55.62 | 58.46 | 61.29 |
| 0.0340 | | 52.40 | 55.07 | 57.74 |
| 0.0350 | 47 | 49.45 | 51.97 | 54.49 |
| 0.0360 | | 46.74 | 49.12 | 51.50 |
| 0.0370 | 46.5 | 44.25 | 46.50 | 48.76 |
| 0.0380 | | 41.95 | 44.09 | 46.23 |
| 0.0381 | 46.1 | 41.73 | 43.86 | 45.98 |
| 0.0390 | 46.0 | 39.83 | 41.86 | 43.89 |
| 0.0400 | | 37.86 | 39.79 | 41.72 |
| 0.0410 | 45.5 | 36.03 | 37.87 | 39.71 |
| 0.0420 | | 34.34 | 36.09 | 37.84 |

| Nom. Diameter [mm] | AWG | Min [Ω/m] | Nominal [Ω/m] | Max [Ω/m] |
|---|---|---|---|---|
| 0.0430 | | 32.76 | 34.43 | 36.10 |
| 0.0437 | | 31.72 | 33.34 | 34.95 |
| 0.0440 | 45 | 31.29 | 32.88 | 34.48 |
| 0.0450 | | 29.91 | 31.44 | 32.96 |
| 0.0460 | | 28.63 | 30.09 | 31.55 |
| 0.0470 | 44.5 | 27.52 | 28.82 | 30.12 |
| 0.0480 | | 26.39 | 27.63 | 28.87 |
| 0.0490 | | 25.32 | 26.51 | 27.71 |
| 0.0500 | 44 | 24.32 | 25.46 | 26.61 |
| 0.0520 | 43.5 | 22.48 | 23.54 | 24.60 |
| 0.0530 | | 21.64 | 22.66 | 23.68 |
| 0.0550 | 43 | 20.10 | 21.05 | 21.99 |
| 0.0560 | | 19.39 | 20.30 | 21.21 |
| 0.0580 | | 18.07 | 18.92 | 19.78 |
| 0.0600 | 42.5 | 16.98 | 17.68 | 18.39 |
| 0.0620 | | 15.90 | 16.56 | 17.22 |
| 0.0630 | 42 | 15.40 | 16.04 | 16.68 |
| 0.0650 | 41.5 | 14.36 | 15.07 | 15.89 |
| 0.0670 | | 13.53 | 14.18 | 14.93 |
| 0.0680 | | 13.14 | 13.77 | 14.48 |
| 0.0700 | 41 | 12.42 | 12.99 | 13.65 |
| 0.0710 | | 12.08 | 12.63 | 13.26 |
| 0.0740 | | 11.14 | 11.63 | 12.18 |
| 0.0750 | 40.5 | 10.85 | 11.32 | 11.85 |
| 0.0780 | 40 | 10.04 | 10.46 | 10.94 |
| 0.0800 | | 9.555 | 9.947 | 10.39 |
| 0.0830 | 39.5 | 8.888 | 9.241 | 9.637 |
| 0.0850 | | 8.481 | 8.811 | 9.180 |
| 0.0880 | 39 | 7.921 | 8.221 | 8.554 |
| 0.0900 | | 7.579 | 7.860 | 8.171 |
| 0.0930 | 38.5 | 7.105 | 7.361 | 7.644 |
| 0.0950 | | 6.813 | 7.054 | 7.320 |
| 0.1000 | | 6.158 | 6.366 | 6.595 |
| 0.101 | 38.0 | 6.038 | 6.241 | 6.463 |
| 0.106 | 37.5 | 5.489 | 5.666 | 5.859 |
| 0.110 | | 5.102 | 5.261 | 5.435 |
| 0.112 | | 4.924 | 5.075 | 5.240 |
| 0.113 | 37 | 4.838 | 4.986 | 5.146 |
| 0.115 | | 4.673 | 4.814 | 4.966 |
| 0.118 | 36.5 | 4.442 | 4.572 | 4.714 |
| 0.120 | | 4.296 | 4.421 | 4.556 |
| 0.125 | | 3.963 | 4.074 | 4.194 |
| 0.126 | 36 | 3.901 | 4.010 | 4.127 |
| 0.130 | | 3.668 | 3.767 | 3.874 |
| 0.132 | | 3.558 | 3.654 | 3.756 |
| 0.134 | 35.5 | 3.454 | 3.545 | 3.643 |

## Electrical Resistance (Continued)

| Nom. Diameter [mm] | AWG | Min [Ω/m] | Nominal [Ω/m] | Max [Ω/m] |
|---|---|---|---|---|
| 0.138 | | 3.259 | 3.343 | 3.433 |
| 0.140 | | 3.167 | 3.248 | 3.334 |
| 0.141 | 35 | 3.123 | 3.202 | 3.287 |
| 0.149 | 34.5 | 2.800 | 2.868 | 2.940 |
| 0.150 | | 2.763 | 2.829 | 2.900 |
| 0.159 | 34.0 | 2.462 | 2.518 | 2.578 |
| 0.160 | | 2.431 | 2.487 | 2.546 |
| 0.169 | 33.5 | 2.181 | 2.229 | 2.280 |
| 0.170 | | 2.156 | 2.203 | 2.253 |
| 0.179 | 33 | 1.946 | 1.987 | 2.030 |
| 0.180 | | 1.925 | 1.965 | 2.007 |
| 0.189 | | 1.747 | 1.782 | 1.819 |
| 0.190 | 32.5 | 1.729 | 1.763 | 1.800 |
| 0.200 | | 1.562 | 1.592 | 1.623 |
| 0.202 | 32 | 1.531 | 1.560 | 1.591 |
| 0.210 | | 1.417 | 1.444 | 1.471 |
| 0.212 | 31.5 | 1.391 | 1.416 | 1.443 |
| 0.220 | | 1.292 | 1.315 | 1.339 |
| 0.222 | | 1.269 | 1.292 | 1.315 |
| 0.224 | | 1.247 | 1.269 | 1.292 |
| 0.225 | 31 | 1.231 | 1.258 | 1.286 |
| 0.230 | | 1.178 | 1.203 | 1.230 |
| 0.236 | | 1.119 | 1.143 | 1.168 |
| 0.239 | | 1.092 | 1.115 | 1.139 |
| 0.240 | 30.5 | 1.083 | 1.105 | 1.129 |
| 0.250 | | 0.9985 | 1.019 | 1.040 |
| 0.253 | 30 | 0.9751 | 0.9946 | 1.015 |
| 0.260 | | 0.9237 | 0.9417 | 0.9607 |
| 0.265 | | 0.8894 | 0.9065 | 0.9245 |
| 0.268 | 29.5 | 0.8697 | 0.8864 | 0.9038 |

| Nom. Diameter [mm] | AWG | Min [Ω/m] | Nominal [Ω/m] | Max [Ω/m] |
|---|---|---|---|---|
| 0.270 | | 0.8570 | 0.8733 | 0.8904 |
| 0.280 | | 0.7973 | 0.8120 | 0.8274 |
| 0.286 | 29 | 0.7644 | 0.7783 | 0.7928 |
| 0.290 | | 0.7436 | 0.7570 | 0.7710 |
| 0.295 | | 0.7188 | 0.7315 | 0.7449 |
| 0.300 | | 0.6952 | 0.7074 | 0.7201 |
| 0.301 | 28.5 | 0.6906 | 0.7027 | 0.7153 |
| 0.315 | | 0.6309 | 0.6416 | 0.6527 |
| 0.319 | 28 | 0.6153 | 0.6256 | 0.6363 |
| 0.335 | | 0.5582 | 0.5673 | 0.5767 |
| 0.339 | 27.5 | 0.5452 | 0.5540 | 0.5630 |
| 0.345 | | 0.5265 | 0.5349 | 0.5435 |
| 0.350 | | 0.5117 | 0.5197 | 0.5280 |
| 0.355 | | 0.4974 | 0.5052 | 0.5132 |
| 0.360 | 27 | 0.4838 | 0.4912 | 0.4989 |
| 0.375 | | 0.4461 | 0.4527 | 0.4596 |
| 0.380 | 26.5 | 0.4333 | 0.4409 | 0.4487 |
| 0.383 | | 0.4266 | 0.4340 | 0.4417 |
| 0.390 | | 0.4115 | 0.4186 | 0.4259 |
| 0.400 | | 0.3913 | 0.3979 | 0.4047 |
| 0.402 | 26 | 0.3875 | 0.3939 | 0.4007 |
| 0.420 | | 0.3552 | 0.3609 | 0.3668 |
| 0.425 | | 0.3469 | 0.3525 | 0.3582 |
| 0.427 | 25.5 | 0.3437 | 0.3492 | 0.3548 |
| 0.450 | | 0.3096 | 0.3144 | 0.3193 |
| 0.453 | 25 | 0.3056 | 0.3102 | 0.3151 |
| 0.475 | | 0.2781 | 0.2822 | 0.2864 |
| 0.481 | 24.5 | 0.2712 | 0.2752 | 0.2793 |
| 0.500 | | 0.2511 | 0.2546 | 0.2583 |
| 0.508 | 24 | 0.2428 | 0.2467 | 0.2507 |