**Designation: ~~B801 – 07 (Reapproved 2012)~~ B801 – 16**

# Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation[1]

This standard is issued under the fixed designation B801; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers aluminum alloys in the 8000 series cited in B800 in tempers "0" and H1X or H2X bare compact-round, compressed and conventional concentric-lay-stranded conductors made from round or shaped wires used as covered or insulated electrical conductors. These conductors shall be composed of a central core surrounded by one or more compacted, compressed or conventional layers of helically applied wires (Explanatory Note 1 and Note 2).

1.2 The SI values for resistivity are regarded as standard. For all other properties, the inch-pound units are regarded as standard and the SI units may be approximate.

1.3 Sealed conductors that are intended to prevent longitudinal water propagation are also permitted within the guidelines of this specification.

## 2. Referenced Documents

2.1 The following documents of the issue in effect on date of material purchase form a part of this specification to the extent referenced herein.

2.2 *ASTM Standards:*[2]
B193 Test Method for Resistivity of Electrical Conductor Materials
B263 Test Method for Determination of Cross-Sectional Area of Stranded Conductors
B354 Terminology Relating to Uninsulated Metallic Electrical Conductors
B800 Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes—Annealed and Intermediate Tempers
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
2.3 *ANSI Standard:*[3]
ANSI H35.1 Alloy and Temper Designation Systems for Aluminum
2.4 *National Bureau of Standards:*[4]
NBS Handbook 100—Copper Wire Tables



## 3. Classification

3.1 For the purpose of this specification, conductors are classified as follows:
3.1.1 *Class A*—For conductors to be covered with weather/resistant materials.
3.1.2 *Class B*—For conductors to be insulated with various materials such as rubber, paper, varnished cloth, etc., and for the conductors indicated under Class A where greater flexibility is required.
3.1.3 *Class C and D*—For conductors where greater flexibility is required than is provided by Class B conductors.

## 4. Ordering Information

4.1 Orders for material under this specification shall include the following information:
4.1.1 Quantity of each size and class (Table 1).

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[1] This specification is under the jurisdiction of ASTM Committee B01 on Electrical Conductors and is the direct responsibility of Subcommittee B01.07 on Conductors of Light Metals.
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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the ~~standard's~~standard's Document Summary page on the ASTM website.
[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.
[4] Available from National Technical Information Service (NTIS), 5285 Port Royal Rd., Springfield, VA 22161, http://www.ntis.gov.

**TABLE 1 Construction Requirements for Aluminum Conductors in the 8000 Series Alloys**

| Conductor Size | | | Class | Number[A] of Wires | Nominal Conductor Diameter | | | | | | Compact | | Nominal Mass | | Nominal d-c resistance[B] at 20°C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Conventional | | Reverse Concentric Compressed | | Unilay Compressed[C] | | | | | | | |
| Cmil | AWG | $mm^2$ | | | in. | mm | in. | mm | in. | mm. | in | mm | lbs/1000 ft | kg/km | Ω/1000 ft | Ω/km |
| 1000000 | | 507 | D | 127 | 1.153 | 29.3 | 1.119 | 28.4 | | | 1.060 | 26.9 | 941 | 1400 | 0.0173 | 0.0568 |
| 1000000 | | 507 | C | 91 | 1.153 | 29.3 | 1.118 | 28.4 | 1.084 | 27.5 | 1.060 | 26.9 | 941 | 1400 | 0.0173 | 0.0568 |
| 1000000 | | 507 | B, A | 61 | 1.152 | 29.3 | 1.117 | 28.4 | | | 1.060 | 26.9 | 941 | 1400 | 0.0173 | 0.0568 |
| 900000 | | 456 | D | 127 | 1.095 | 27.8 | 1.062 | 27.0 | | | 0.999 | 25.4 | 847 | 1260 | 0.0193 | 0.0633 |
| 900000 | | 456 | C | 91 | 1.093 | 27.8 | 1.060 | 26.9 | 1.028 | 26.1 | 0.999 | 25.4 | 847 | 1260 | 0.0193 | 0.0633 |
| 900000 | | 456 | B, A | 61 | 1.093 | 27.8 | 1.060 | 26.9 | | | 0.999 | 25.4 | 847 | 1260 | 0.0193 | 0.0633 |
| 800000 | | 405 | D | 127 | 1.032 | 26.2 | 1.001 | 25.4 | | | 0.938 | 23.8 | 753 | 1120 | 0.0217 | 0.0712 |
| 800000 | | 405 | C | 91 | 1.032 | 26.2 | 1.001 | 25.4 | 0.969 | 24.6 | 0.938 | 23.8 | 753 | 1120 | 0.0217 | 0.0712 |
| 800000 | | 405 | B, A | 61 | 1.031 | 26.2 | 1.000 | 25.4 | | | 0.938 | 23.8 | 753 | 1120 | 0.0217 | 0.0712 |
| 750000 | | 380 | D | 127 | 0.998 | 25.3 | 0.968 | 24.6 | | | 0.908 | 23.1 | 706 | 1050 | 0.0231 | 0.0758 |
| 750000 | | 380 | C | 91 | 0.999 | 25.4 | 0.969 | 24.6 | 0.939 | 23.9 | 0.908 | 23.1 | 706 | 1050 | 0.0231 | 0.0758 |
| 750000 | | 380 | B, A | 61 | 0.998 | 25.3 | 0.968 | 24.6 | | | 0.908 | 23.1 | 706 | 1050 | 0.0231 | 0.0758 |
| 700000 | | 355 | D | 127 | 0.965 | 24.5 | 0.936 | 23.8 | | | 0.877 | 22.3 | 659 | 981 | 0.0248 | 0.0814 |
| 700000 | | 355 | C | 91 | 0.965 | 24.5 | 0.936 | 23.8 | 0.907 | 23.0 | 0.877 | 22.3 | 659 | 981 | 0.0248 | 0.0814 |
| 700000 | | 355 | B, A | 61 | 0.964 | 24.5 | 0.935 | 23.7 | | | 0.877 | 22.3 | 659 | 981 | 0.0248 | 0.0814 |
| 650000 | | 329 | D | 127 | 0.930 | 23.6 | 0.902 | 22.9 | | | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 650000 | | 329 | C | 91 | 0.930 | 23.6 | 0.902 | 22.9 | 0.874 | 22.2 | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 650000 | | 329 | B | 61 | 0.929 | 23.6 | 0.901 | 22.9 | | | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 650000 | | 329 | A | 37 | 0.928 | 23.6 | 0.900 | 22.9 | | | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 600000 | | 304 | D | 127 | 0.893 | 22.7 | 0.866 | 22.0 | | | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 600000 | | 304 | C | 91 | 0.893 | 22.7 | 0.866 | 22.0 | 0.840 | 21.3 | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 600000 | | 304 | B | 61 | 0.893 | 22.7 | 0.866 | 22.0 | | | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 600000 | | 304 | A | 37 | 0.891 | 22.6 | 0.864 | 21.9 | | | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 556500 | | 282 | D | 127 | 0.861 | 21.9 | 0.835 | 21.2 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 556500 | | 282 | C | 91 | 0.860 | 21.8 | 0.834 | 21.2 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 556500 | | 282 | B | 61 | 0.860 | 21.8 | 0.834 | 21.2 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 556500 | | 282 | A | 37 | 0.858 | 21.8 | 0.832 | 21.1 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 550000 | | 279 | D | 127 | 0.855 | 21.7 | 0.829 | 21.1 | | | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 550000 | | 279 | C | 91 | 0.855 | 21.7 | 0.829 | 21.1 | | | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 550000 | | 279 | B | 61 | 0.855 | 21.7 | 0.829 | 21.1 | 0.804 | 20.4 | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 550000 | | 279 | A | 37 | 0.853 | 21.7 | 0.827 | 21.0 | | | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 500000 | | 253 | D | 91 | 0.815 | 20.7 | 0.791 | 20.1 | | | 0.736 | 18.7 | 471 | 701 | 0.0347 | 0.1139 |
| 500000 | | 253 | C | 61 | 0.815 | 20.7 | 0.791 | 20.1 | 0.766 | 19.5 | 0.736 | 18.7 | 471 | 701 | 0.0347 | 0.1139 |
| 500000 | | 253 | B, A | 37 | 0.813 | 20.7 | 0.789 | 20.0 | | | 0.736 | 18.7 | 471 | 701 | 0.0347 | 0.1139 |
| 477000 | | 242 | D | 91 | 0.796 | 20.2 | 0.772 | 19.6 | | | 0.722 | 18.3 | 449 | 668 | 0.0364 | 0.1194 |
| 477000 | | 242 | C | 61 | 0.796 | 20.2 | 0.772 | 19.6 | | | 0.722 | 18.3 | 449 | 668 | 0.0364 | 0.1194 |
| 477000 | | 242 | B, A | 37 | 0.795 | 20.2 | 0.771 | 19.6 | | | 0.722 | 18.3 | 449 | 668 | 0.0364 | 0.1194 |
| 450000 | | 228 | D | 91 | 0.773 | 19.6 | 0.750 | 19.0 | | | 0.700 | 17.8 | 424 | 631 | 0.0385 | 0.1263 |
| 450000 | | 228 | C | 61 | 0.773 | 19.6 | 0.750 | 19.0 | 0.727 | 18.5 | 0.700 | 17.8 | 424 | 631 | 0.0385 | 0.1263 |
| 450000 | | 228 | B, A | 37 | 0.772 | 19.6 | 0.749 | 19.0 | | | 0.700 | 17.8 | 424 | 631 | 0.0385 | 0.1263 |
| 400000 | | 203 | D | 91 | 0.729 | 18.5 | 0.707 | 18.0 | | | 0.659 | 16.7 | 376 | 559 | 0.0434 | 0.1424 |
| 400000 | | 203 | C | 61 | 0.729 | 18.5 | 0.707 | 18.0 | 0.685 | 17.4 | 0.659 | 16.7 | 376 | 559 | 0.0434 | 0.1424 |
| 400000 | | 203 | B, A | 37 | 0.728 | 18.5 | 0.706 | 17.9 | | | 0.659 | 16.7 | 376 | 559 | 0.0434 | 0.1424 |
| 397500 | | 201 | D | 91 | 0.727 | 18.5 | 0.705 | 17.9 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 397500 | | 201 | C | 61 | 0.726 | 18.4 | 0.704 | 17.9 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 397500 | | 201 | B | 37 | 0.725 | 18.4 | 0.703 | 17.9 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 397500 | | 201 | A | 19 | 0.724 | 18.4 | 0.702 | 17.8 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 350000 | | 177 | D | 91 | 0.682 | 17.3 | 0.661 | 16.8 | | | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 350000 | | 177 | C | 61 | 0.681 | 17.3 | 0.661 | 16.8 | 0.641 | 16.3 | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 350000 | | 177 | B | 37 | 0.681 | 17.3 | 0.661 | 16.8 | | | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 350000 | | 177 | A | 19 | 0.679 | 17.2 | 0.659 | 16.7 | | | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 336400 | | 170 | C | 61 | 0.669 | 17.0 | 0.649 | 16.5 | | | 0.603 | 15.3 | 317 | 472 | 0.0516 | 0.1693 |
| 336400 | | 170 | B | 37 | 0.668 | 17.0 | 0.648 | 16.5 | | | 0.603 | 15.3 | 317 | 472 | 0.0516 | 0.1693 |
| 336400 | | 170 | A | 19 | 0.666 | 16.9 | 0.646 | 16.4 | | | 0.603 | 15.3 | 317 | 472 | 0.0516 | 0.1693 |
| 300000 | | 152 | C | 61 | 0.631 | 16.0 | 0.612 | 15.5 | | | 0.570 | 14.5 | 282 | 420 | 0.0578 | 0.1896 |
| 300000 | | 152 | B | 37 | 0.630 | 16.0 | 0.611 | 15.5 | 0.594 | 15.1 | 0.570 | 14.5 | 282 | 420 | 0.0578 | 0.1896 |
| 300000 | | 152 | A | 19 | 0.629 | 16.0 | 0.610 | 15.5 | | | 0.576 | 14.5 | 282 | 420 | 0.0578 | 0.1896 |
| 266800 | | 135 | C | 61 | 0.595 | 15.1 | 0.577 | 14.7 | | | 0.537 | 13.6 | 251 | 373 | 0.0650 | 0.2133 |
| 266800 | | 135 | B | 37 | 0.594 | 15.1 | 0.576 | 14.6 | | | 0.537 | 13.6 | 251 | 373 | 0.0650 | 0.2133 |
| 266800 | | 135 | A | 19 | 0.593 | 15.0 | 0.575 | 14.6 | | | 0.537 | 13.6 | 251 | 373 | 0.0650 | 0.2133 |
| 250000 | | 127 | C | 61 | 0.576 | 14.6 | 0.559 | 14.2 | | | 0.520 | 13.2 | 235 | 350 | 0.0694 | 0.2277 |
| 250000 | | 127 | B | 37 | 0.575 | 14.6 | 0.558 | 14.2 | 0.542 | 13.8 | 0.520 | 13.2 | 235 | 350 | 0.0694 | 0.2277 |
| 250000 | | 127 | A | 19 | 0.574 | 14.6 | 0.557 | 14.1 | | | 0.520 | 13.2 | 235 | 350 | 0.0694 | 0.2277 |
| 211600 | 0000 | 107 | C | 37 | 0.529 | 13.4 | 0.513 | 13.0 | | | 0.475 | 12.1 | 199 | 296 | 0.0820 | 0.2690 |
| 211600 | 0000 | 107 | B | 19 | 0.528 | 13.4 | 0.512 | 13.0 | 0.498 | 12.6 | 0.475 | 12.1 | 199 | 296 | 0.0820 | 0.2690 |
| 211600 | 0000 | 107 | A | 7 | 0.522 | 13.3 | 0.506 | 13.0 | | | 0.475 | 12.1 | 199 | 296 | 0.0820 | 0.2690 |
| 167800 | 000 | 85.0 | C | 37 | 0.471 | 12.0 | 0.457 | 11.6 | | | 0.423 | 10.7 | 158 | 235 | 0.1033 | 0.3389 |
| 167800 | 000 | 85.0 | B | 19 | 0.470 | 11.9 | 0.456 | 11.6 | 0.443 | 11.3 | 0.423 | 10.7 | 158 | 235 | 0.1033 | 0.3389 |
| 167800 | 000 | 85.0 | A | 7 | 0.464 | 11.8 | 0.450 | 11.4 | | | 0.423 | 10.7 | 158 | 235 | 0.1033 | 0.3389 |

**TABLE 1** *Continued*

| Conductor Size | | | Class | Number[A] of Wires | Nominal Conductor Diameter | | | | | | Compact | | Nominal Mass | | Nominal d-c resistance[B] at 20°C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Conventional | | Reverse Concentric Compressed | | Unilay Compressed[C] | | | | | | | |
| Cmil | AWG | $mm^2$ | | | in. | mm | in. | mm | in. | mm. | in | mm | lbs/1000 ft | kg/km | Ω/1000 ft | Ω/km |
| 133100 | 00 | 67.4 | B | 19 | 0.419 | 10.6 | 0.406 | 10.3 | 0.395 | 10.0 | 0.376 | 9.55 | 125 | 186 | 0.1303 | 0.4275 |
| 133100 | 00 | 67.4 | A | 7 | 0.414 | 10.5 | 0.402 | 10.2 | | | 0.376 | 9.55 | 125 | 186 | 0.1303 | 0.4275 |
| 105600 | 0 | 53.5 | B | 19 | 0.373 | 9.46 | 0.362 | 9.19 | | | 0.336 | 8.53 | 99.4 | 148 | 0.1642 | 0.5387 |
| 105600 | 0 | 53.5 | A | 7 | 0.368 | 9.36 | 0.357 | 9.07 | 0.352 | 8.94 | 0.336 | 8.53 | 99.4 | 148 | 0.1642 | 0.5387 |
| 83690 | 1 | 42.4 | B | 19 | 0.332 | 8.43 | 0.322 | 8.18 | 0.313 | 7.95 | 0.299 | 7.59 | 78.8 | 117 | 0.2072 | 0.6798 |
| 66360 | 2 | 33.6 | B, A | 7 | 0.292 | 7.42 | 0.283 | 7.19 | | | 0.268 | 6.81 | 62.5 | 93.0 | 0.2613 | 0.8573 |
| 52620 | 3 | 26.7 | B, A | 7 | 0.260 | 6.61 | 0.252 | 6.41 | | | 0.238 | 6.05 | 49.5 | 73.7 | 0.3296 | 1.0814 |
| 41740 | 4 | 21.2 | B, A | 7 | 0.232 | 5.88 | 0.225 | 5.72 | | | 0.213 | 5.41 | 39.3 | 58.5 | 0.4155 | 1.3633 |
| 26240 | 6 | 13.3 | B, A | 7 | 0.184 | 4.66 | 0.178 | 4.53 | | | 0.169 | 4.29 | 24.7 | 36.8 | 0.6609 | 2.1684 |
| 16510 | 8 | 8.37 | B, A | 7 | 0.146 | 3.70 | 0.142 | 3.60 | | | 0.134 | 3.40 | 15.5 | 23.1 | 1.0504 | 3.4464 |

[A] For compact-stranded constructions, the number of wires may be reduced as follows:

19-Wire Constructions—18 Wires Minimum
37-Wire Constructions—35 Wires Minimum
61-Wire Constructions—58 Wires Minimum
91-Wire Constructions—87 Wires Minimum
127-Wire Constructions—122 Wires Minimum

[B] Nominal d-c resistance is based on 61.0 % IACS conductivity (17.002 Ω/cmil/ft). See Explanatory Note 3.

[C] The diameters listed in the Unilay Compressed column correspond to Class B conductor constructions.

4.1.2 Conductor size; circular-mil area or Awg (Section 7),
4.1.3 Class (See 3.1),
4.1.4 Temper (Section 12),
4.1.5 Lay direction if nonstandard (See 6.3 and 6.4), reversed or unidirectional (See 6.3) or special (See 6.4),
4.1.6 Special tension test, if required (See 8.2),
4.1.7 Packaging (Section 19),
4.1.8 Special package marking (Section 19), and
4.1.9 Place of inspection (Section 18).



## 5. Joints

5.1 Joints may be made in any of the wires of any stranding by electric-butt welding, cold-pressure welding, or electric-butt, cold-upset welding.



5.2 Joints in the individual wires in a finished conductor shall be not closer together than 1 ft (0.3 m) for conductors of 19 wires or less, or closer than 1 ft (0.3 m) in a layer for conductors of more than 19 wires.

5.3 No joint or splice shall be made in a stranded conductor as a whole.

## 6. Lay

6.1 The length of lay for all classes shall be not less than 8 nor more than 16 times the outside diameter of that layer, except that for conductors composed of 37 wires or more, this requirement shall apply only to the two outer layers. The lay of the layers other than the two outer layers shall be at the option of the manufacturer, unless otherwise agreed upon.

6.1.1 For conductors to be used in covered or insulated wires or cables, the lay length of the wires shall be not less than 8 nor more than 16 times the outer diameter of the finished conductor. For conductors of 37 wires or more, this requirement shall apply to the wires in the outer two layers. The lay of the layers other than the two outer layers shall be at the option of the manufacturer, unless otherwise agreed upon.

6.2 The direction of lay for Class A conductors shall be right-hand.

~~**TABLE 1 Construction Requirements for Aluminum Conductors in the 8000 Series Alloys**~~

| ~~Conductor Size~~ | | | ~~Class~~ | ~~Number[A] of Wires~~ | ~~Nominal Conductor Diameter~~ | | | | | | ~~Compact~~ | | ~~Nominal Mass~~ | | ~~Nominal d-c resistance[B] at 20°C~~ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ~~Conventional~~ | | ~~Reverse Concentric Compressed~~ | | ~~Unilay Compressed~~ | | | | | | | |
| ~~Cmil~~ | ~~AWG~~ | ~~$mm^2$~~ | | | ~~in.~~ | ~~mm~~ | ~~in.~~ | ~~mm~~ | ~~in.~~ | ~~mm.~~ | ~~in~~ | ~~mm~~ | ~~lbs/1000 ft~~ | ~~kg/km~~ | ~~Ω/1000 ft~~ | ~~Ω/km~~ |
| ~~1000000~~ | | ~~507~~ | ~~D~~ | ~~127~~ | ~~1.153~~ | ~~29.3~~ | ~~1.119~~ | ~~28.4~~ | | | ~~1.060~~ | ~~26.9~~ | ~~941~~ | ~~1400~~ | ~~0.0173~~ | ~~0.0568~~ |
| ~~1000000~~ | | ~~507~~ | ~~C~~ | ~~91~~ | ~~1.153~~ | ~~29.3~~ | ~~1.118~~ | ~~28.4~~ | ~~1.084~~ | ~~27.5~~ | ~~1.060~~ | ~~26.9~~ | ~~941~~ | ~~1400~~ | ~~0.0173~~ | ~~0.0568~~ |

**TABLE 1** *Continued*

| Conductor Size | | | Class | Number[A] of Wires | Nominal Conductor Diameter | | | | | | Compact | | Nominal Mass | | Nominal d-c resistance[B] at 20°C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Conventional | | Reverse Concentric Compressed | | Unilay Compressed | | | | | | | |
| Cmil | AWG | $mm^2$ | | | in. | mm | in. | mm | in. | mm. | in | mm | lbs/1000 ft | kg/km | Ω/1000 ft | Ω/km |
| 1000000 | | 507 | B, A | 61 | 1.152 | 29.3 | 1.117 | 28.4 | | | 1.060 | 26.9 | 941 | 1400 | 0.0173 | 0.0568 |
| 900000 | | 456 | D | 127 | 1.095 | 27.8 | 1.062 | 27.0 | | | 0.999 | 25.4 | 847 | 1260 | 0.0193 | 0.0633 |
| 900000 | | 456 | C | 91 | 1.093 | 27.8 | 1.060 | 26.9 | 1.028 | 26.1 | 0.999 | 25.4 | 847 | 1260 | 0.0193 | 0.0633 |
| 900000 | | 456 | B, A | 61 | 1.093 | 27.8 | 1.060 | 26.9 | | | 0.999 | 25.4 | 847 | 1260 | 0.0193 | 0.0633 |
| 800000 | | 405 | D | 127 | 1.032 | 26.2 | 1.001 | 25.4 | | | 0.938 | 23.8 | 753 | 1120 | 0.0217 | 0.0712 |
| 800000 | | 405 | C | 91 | 1.032 | 26.2 | 1.001 | 25.4 | 0.969 | 24.6 | 0.938 | 23.8 | 753 | 1120 | 0.0217 | 0.0712 |
| 800000 | | 405 | B, A | 61 | 1.031 | 26.2 | 1.000 | 25.4 | | | 0.938 | 23.8 | 753 | 1120 | 0.0217 | 0.0712 |
| 750000 | | 380 | D | 127 | 0.998 | 25.3 | 0.968 | 24.6 | | | 0.908 | 23.1 | 706 | 1050 | 0.0231 | 0.0758 |
| 750000 | | 380 | C | 91 | 0.999 | 25.4 | 0.969 | 24.6 | 0.939 | 23.9 | 0.908 | 23.1 | 706 | 1050 | 0.0231 | 0.0758 |
| 750000 | | 380 | B, A | 61 | 0.998 | 25.3 | 0.968 | 24.6 | | | 0.908 | 23.1 | 706 | 1050 | 0.0231 | 0.0758 |
| 700000 | | 355 | D | 127 | 0.965 | 24.5 | 0.936 | 23.8 | | | 0.877 | 22.3 | 659 | 981 | 0.0248 | 0.0814 |
| 700000 | | 355 | C | 91 | 0.965 | 24.5 | 0.936 | 23.8 | 0.907 | 23.0 | 0.877 | 22.3 | 659 | 981 | 0.0248 | 0.0814 |
| 700000 | | 355 | B, A | 61 | 0.964 | 24.5 | 0.935 | 23.7 | | | 0.877 | 22.3 | 659 | 981 | 0.0248 | 0.0814 |
| 650000 | | 329 | D | 127 | 0.930 | 23.6 | 0.902 | 22.9 | | | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 650000 | | 329 | C | 91 | 0.930 | 23.6 | 0.902 | 22.9 | 0.874 | 22.2 | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 650000 | | 329 | B | 61 | 0.929 | 23.6 | 0.901 | 22.9 | | | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 650000 | | 329 | A | 37 | 0.928 | 23.6 | 0.900 | 22.9 | | | 0.845 | 21.5 | 612 | 911 | 0.0267 | 0.0876 |
| 600000 | | 304 | D | 127 | 0.893 | 22.7 | 0.866 | 22.0 | | | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 600000 | | 304 | C | 91 | 0.893 | 22.7 | 0.866 | 22.0 | 0.840 | 21.3 | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 600000 | | 304 | B | 61 | 0.893 | 22.7 | 0.866 | 22.0 | | | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 600000 | | 304 | A | 37 | 0.891 | 22.6 | 0.864 | 21.9 | | | 0.813 | 20.7 | 565 | 841 | 0.0289 | 0.0948 |
| 556500 | | 282 | D | 127 | 0.861 | 21.9 | 0.835 | 21.2 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 556500 | | 282 | C | 91 | 0.860 | 21.8 | 0.834 | 21.2 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 556500 | | 282 | B | 61 | 0.860 | 21.8 | 0.834 | 21.2 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 556500 | | 282 | A | 37 | 0.858 | 21.8 | 0.832 | 21.1 | | | 0.780 | 19.8 | 524 | 780 | 0.0312 | 0.1024 |
| 550000 | | 279 | D | 127 | 0.855 | 21.7 | 0.829 | 21.1 | | | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 550000 | | 279 | C | 91 | 0.855 | 21.7 | 0.829 | 21.1 | | | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 550000 | | 279 | B | 61 | 0.855 | 21.7 | 0.829 | 21.1 | 0.804 | 20.4 | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 550000 | | 279 | A | 37 | 0.853 | 21.7 | 0.827 | 21.0 | | | 0.775 | 19.7 | 518 | 771 | 0.0315 | 0.1034 |
| 500000 | | 253 | D | 91 | 0.815 | 20.7 | 0.791 | 20.1 | | | 0.736 | 18.7 | 471 | 701 | 0.0347 | 0.1139 |
| 500000 | | 253 | C | 61 | 0.815 | 20.7 | 0.791 | 20.1 | 0.766 | 19.5 | 0.736 | 18.7 | 471 | 701 | 0.0347 | 0.1139 |
| 500000 | | 253 | B, A | 37 | 0.813 | 20.7 | 0.789 | 20.0 | | | 0.736 | 18.7 | 471 | 701 | 0.0347 | 0.1139 |
| 477000 | | 242 | D | 91 | 0.796 | 20.2 | 0.772 | 19.6 | | | 0.722 | 18.3 | 449 | 668 | 0.0364 | 0.1194 |
| 477000 | | 242 | C | 61 | 0.796 | 20.2 | 0.772 | 19.6 | | | 0.722 | 18.3 | 449 | 668 | 0.0364 | 0.1194 |
| 477000 | | 242 | B, A | 37 | 0.795 | 20.2 | 0.771 | 19.6 | | | 0.722 | 18.3 | 449 | 668 | 0.0364 | 0.1194 |
| 450000 | | 228 | D | 91 | 0.773 | 19.6 | 0.750 | 19.0 | | | 0.700 | 17.8 | 424 | 631 | 0.0385 | 0.1263 |
| 450000 | | 228 | C | 61 | 0.773 | 19.6 | 0.750 | 19.0 | 0.727 | 18.5 | 0.700 | 17.8 | 424 | 631 | 0.0385 | 0.1263 |
| 450000 | | 228 | B, A | 37 | 0.772 | 19.6 | 0.749 | 19.0 | | | 0.700 | 17.8 | 424 | 631 | 0.0385 | 0.1263 |
| 400000 | | 203 | D | 91 | 0.729 | 18.5 | 0.707 | 18.0 | | | 0.659 | 16.7 | 376 | 559 | 0.0434 | 0.1424 |
| 400000 | | 203 | C | 61 | 0.729 | 18.5 | 0.707 | 18.0 | 0.685 | 17.4 | 0.659 | 16.7 | 376 | 559 | 0.0434 | 0.1424 |
| 400000 | | 203 | B, A | 37 | 0.728 | 18.5 | 0.706 | 17.9 | | | 0.659 | 16.7 | 376 | 559 | 0.0434 | 0.1424 |
| 397500 | | 201 | D | 91 | 0.727 | 18.5 | 0.705 | 17.9 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 397500 | | 201 | C | 61 | 0.726 | 18.4 | 0.704 | 17.9 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 397500 | | 201 | B | 37 | 0.725 | 18.4 | 0.703 | 17.9 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 397500 | | 201 | A | 19 | 0.724 | 18.4 | 0.702 | 17.8 | | | 0.659 | 16.7 | 374 | 557 | 0.0436 | 0.1431 |
| 350000 | | 177 | D | 91 | 0.682 | 17.3 | 0.661 | 16.8 | | | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 350000 | | 177 | C | 61 | 0.681 | 17.3 | 0.661 | 16.8 | 0.641 | 16.3 | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 350000 | | 177 | B | 37 | 0.681 | 17.3 | 0.661 | 16.8 | | | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 350000 | | 177 | A | 19 | 0.679 | 17.2 | 0.659 | 16.7 | | | 0.616 | 15.6 | 329 | 490 | 0.0495 | 0.1624 |
| 336400 | | 170 | C | 61 | 0.669 | 17.0 | 0.649 | 16.5 | | | 0.603 | 15.3 | 317 | 472 | 0.0516 | 0.1693 |
| 336400 | | 170 | B | 37 | 0.668 | 17.0 | 0.648 | 16.5 | | | 0.603 | 15.3 | 317 | 472 | 0.0516 | 0.1693 |
| 336400 | | 170 | A | 19 | 0.666 | 16.9 | 0.646 | 16.4 | | | 0.603 | 15.3 | 317 | 472 | 0.0516 | 0.1693 |
| 300000 | | 152 | C | 61 | 0.631 | 16.0 | 0.612 | 15.5 | | | 0.570 | 14.5 | 282 | 420 | 0.0578 | 0.1896 |
| 300000 | | 152 | B | 37 | 0.630 | 16.0 | 0.611 | 15.5 | 0.594 | 15.1 | 0.570 | 14.5 | 282 | 420 | 0.0578 | 0.1896 |
| 300000 | | 152 | A | 19 | 0.629 | 16.0 | 0.610 | 15.5 | | | 0.576 | 14.5 | 282 | 420 | 0.0578 | 0.1896 |
| 266800 | | 135 | C | 61 | 0.595 | 15.1 | 0.577 | 14.7 | | | 0.537 | 13.6 | 251 | 373 | 0.0650 | 0.2133 |
| 266800 | | 135 | B | 37 | 0.594 | 15.1 | 0.576 | 14.6 | | | 0.537 | 13.6 | 251 | 373 | 0.0650 | 0.2133 |
| 266800 | | 135 | A | 19 | 0.593 | 15.0 | 0.575 | 14.6 | | | 0.537 | 13.6 | 251 | 373 | 0.0650 | 0.2133 |
| 250000 | | 127 | C | 61 | 0.576 | 14.6 | 0.559 | 14.2 | | | 0.520 | 13.2 | 235 | 350 | 0.0694 | 0.2277 |
| 250000 | | 127 | B | 37 | 0.575 | 14.6 | 0.558 | 14.2 | 0.542 | 13.8 | 0.520 | 13.2 | 235 | 350 | 0.0694 | 0.2277 |
| 250000 | | 127 | A | 19 | 0.574 | 14.6 | 0.557 | 14.1 | | | 0.520 | 13.2 | 235 | 350 | 0.0694 | 0.2277 |
| 211600 | 0000 | 107 | C | 37 | 0.529 | 13.4 | 0.513 | 13.0 | | | 0.475 | 12.1 | 199 | 296 | 0.0820 | 0.2690 |
| 211600 | 0000 | 107 | B | 19 | 0.528 | 13.4 | 0.512 | 13.0 | 0.498 | 12.6 | 0.475 | 12.1 | 199 | 296 | 0.0820 | 0.2690 |
| 211600 | 0000 | 107 | A | 7 | 0.522 | 13.3 | 0.506 | 13.0 | | | 0.475 | 12.1 | 199 | 296 | 0.0820 | 0.2690 |
| 167800 | 000 | 85.0 | C | 37 | 0.471 | 12.0 | 0.457 | 11.6 | | | 0.423 | 10.7 | 158 | 235 | 0.1033 | 0.3389 |
| 167800 | 000 | 85.0 | B | 19 | 0.470 | 11.9 | 0.456 | 11.6 | 0.443 | 11.3 | 0.423 | 10.7 | 158 | 235 | 0.1033 | 0.3389 |
| 167800 | 000 | 85.0 | A | 7 | 0.464 | 11.8 | 0.450 | 11.4 | | | 0.423 | 10.7 | 158 | 235 | 0.1033 | 0.3389 |
| 133100 | 00 | 67.4 | B | 19 | 0.419 | 10.6 | 0.406 | 10.3 | 0.395 | 10.0 | 0.376 | 9.55 | 125 | 186 | 0.1303 | 0.4275 |
| 133100 | 00 | 67.4 | A | 7 | 0.414 | 10.5 | 0.402 | 10.2 | | | 0.376 | 9.55 | 125 | 186 | 0.1303 | 0.4275 |
| 105600 | 0 | 53.5 | B | 19 | 0.373 | 9.46 | 0.362 | 9.19 | | | 0.336 | 8.53 | 99.4 | 148 | 0.1642 | 0.5387 |

**TABLE 1** *Continued*

| Conductor Size | | | Class | Number[A] of Wires | Nominal Conductor Diameter | | | | | | Compact | | Nominal Mass | | Nominal d-c resistance[B] at 20°C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Conventional | | Reverse Concentric Compressed | | Unilay Compressed | | | | | | | |
| Cmil | AWG | $mm^2$ | | | in. | mm | in. | mm | in. | mm. | in | mm | lbs/1000 ft | kg/km | Ω/1000 ft | Ω/km |
| 105600 | 0 | 53.5 | A | 7 | 0.368 | 9.36 | 0.357 | 9.07 | 0.352 | 8.94 | 0.336 | 8.53 | 99.4 | 148 | 0.1642 | 0.5387 |
| 83690 | 1 | 42.4 | B | 19 | 0.332 | 8.43 | 0.322 | 8.18 | 0.313 | 7.95 | 0.299 | 7.59 | 78.8 | 117 | 0.2072 | 0.6798 |
| 66360 | 2 | 33.6 | B, A | 7 | 0.292 | 7.42 | 0.283 | 7.19 | | | 0.268 | 6.81 | 62.5 | 93.0 | 0.2613 | 0.8573 |
| 52620 | 3 | 26.7 | B, A | 7 | 0.260 | 6.61 | 0.252 | 6.41 | | | 0.238 | 6.05 | 49.5 | 73.7 | 0.3296 | 1.0814 |
| 41740 | 4 | 21.2 | B, A | 7 | 0.232 | 5.88 | 0.225 | 5.72 | | | 0.213 | 5.41 | 39.3 | 58.5 | 0.4155 | 1.3633 |
| 26240 | 6 | 13.3 | B, A | 7 | 0.184 | 4.66 | 0.178 | 4.53 | | | 0.169 | 4.29 | 24.7 | 36.8 | 0.6609 | 2.1684 |
| 16510 | 8 | 8.37 | B, A | 7 | 0.146 | 3.70 | 0.142 | 3.60 | | | 0.134 | 3.40 | 15.5 | 23.1 | 1.0504 | 3.4464 |

[A] For compact-stranded constructions, the number of wires may be reduced as follows:

—

19-Wire Constructions—18 Wires Minimum
37-Wire Constructions—35 Wires Minimum
61-Wire Constructions—58 Wires Minimum
91-Wire Constructions—87 Wires Minimum
127-Wire Constructions—122 Wires Minimum

[B] Nominal d-c resistance is based on 61.0 % IACS conductivity (17.002 Ω/cmil/ft).
See Explanatory Note 3.

6.3 The direction of lay of the outer layer shall be left-hand for all other classes, unless the direction is specified otherwise by the purchaser.

6.4 The direction of lay shall be reversed in successive layers in conventional and compressed constructions. In compact constructions, the lay of the successive layers may be either reversed or unidirectional.

6.4.1 For conductors to be used in covered or insulated wires or cables, the direction of lay of the outer layer shall be left-hand and may be reversed or unidirectional or unilay in successive layers, unless otherwise agreed upon with the purchaser.

6.5 The maximum length of lay for compact conductors AWG 2 and smaller shall be 17.5 times the outside diameter of that layer.

6.6 Other lay requirements may be furnished by special agreement between the manufacturer and the purchaser.



## 7. Construction

7.1 The construction of the conductors shall be as shown in Table 1 as to number of wires and cross-sectional area of the completed conductor, and the lay shall be in accordance with Section 6.



7.2 Wire used in the fabrication of conductor shall be of such dimensions as to produce a finished conductor having a nominal cross-sectional area and diameter as prescribed in Table 1.

7.3 Where compressed stranding is required in order to insulate the conductor properly, one or more layers of any stranded conductor consisting of seven wires or more may be slightly compressed, thereby reducing the outside diameter of the conductor by not more than 3 %, provided that the area of cross-section after compressing is in accordance with Section 15.

## 8. Mechanical and Electrical Tests of Conductors in 8000 Series Alloys in "0" Temper, H1X or H2X Wire and Not Annealed After Stranding

8.1 Tests for the mechanical and electrical properties of wire composing the conductor shall be made before, but not after stranding, unless otherwise agreed upon between the manufacturer and the purchaser as provided in 8.2 (Explanatory Note 4).

8.2 At the option of the purchaser, at the time of placing the order, tension and elongation tests of wire before stranding may be waived, and the completed conductor may be tested as a unit. The minimum breaking strength of conductors so tested shall be not less than the minimum rated strength of 8000 Series Aluminum Alloys "0" Temper or H1X and H2X conductors, whichever is applicable. The minimum breaking strength of bare conductors shall be not less than minimum rated strength if failure occurs in the free length at least 1 in. (25 mm) beyond the end of either gripping device, or shall be not less than 95 % of the minimum rated strength if failure occurs inside, or within 1 in. of the end of either gripping device. The maximum breaking strength of 8000 Series Aluminum Alloys "0" Temper or H1X and H2X conductors, whichever is applicable, shall be not greater than their maximum rated strengths. The free length between grips of the test specimen shall be not less than 24 in. (600 mm) and care shall be taken to ensure that the wires in the conductor are evenly gripped during the test (Section 13 and Explanatory Note 5).

## 9. Mechanical and Electrical Tests of Conductors Fabricated from Wires Other Than 8000-H2X and Annealed After Stranding to Meet 8000 "0" Temper or H2X Requirements

9.1 At the option of the manufacturer, mechanical and electrical tests may be performed in accordance with either paragraph 9.1.1 or 9.1.2.

9.1.1 The completed conductor shall be tested as a unit. The minimum breaking strength of bare conductors shall be not less than minimum rated strength if failure occurs in the free length at least 1 in. (25 mm) beyond the end of either gripping device, or shall be not less than 95 % of the minimum rated strength if failure occurs inside, or within 1 in. of the end of either gripping device. The maximum breaking strength of 8000 "0" Temper, or H2X conductors shall be not greater than their maximum rated strengths. The free length between grips of the test specimen shall be not less than 24 in. (600 mm), and care shall be taken to ensure that the wires in the conductor are evenly gripped during the test (Section 13 and Explanatory Note 5).

9.1.1.1 The nominal d-c resistance of the completed conductor in Ω/1000 ft shall conform to Table 1. The maximum d-c resistance for any conductor shall be taken as nominal + 2 %.

9.1.2 When wires removed from the stranded conductor are tested, intermediate temper (–H2X) wire shall have tensile strengths not less than 95 % of the minimum tensile strength nor more than 105 % of the maximum tensile strength prescribed in Specification B800.

9.1.3 When electrical testing is conducted on wires removed from the stranded conductor, the resistivity shall conform to Specification B800.

## 10. Mass and Electrical Resistance

10.1 The mass and electrical resistance of a unit length of stranded conductor are a function of the length of lay. The approximate mass and electrical resistance may be determined using an increment of 2 %. When greater accuracy is desired, the increment based on the specific lay of the conductor may be calculated (Explanatory Note 6).

10.2 The maximum electrical resistance of a unit length of stranded conductor shall not exceed the nominal d-c resistance (Table 1) + 2 %. (See Explanatory Note 6).

10.2.1 When the d-c resistance is measured at other than 20°C, it is to be corrected by using the multiplying factor given in Table 2.

10.3 For conductors to be used in covered or insulated wires or cables, direct current (D-C) resistance measurement may be used instead of the method outlined in Section 15 to determine compliance with this specification.

## 11. Workmanship, Finish, and Appearance

11.1 The conductor shall be clean and free from imperfections not consistent with good commercial practice.

## 12. Requirements of Wires

12.1 Wires annealed before stranding shall meet the requirements of Specification B800.

12.2 Wires shaped before stranding are not required to meet a specific dimension or area tolerance. The area tolerances for shaped wire of all tempers shall be such that the finished conductor conforms to Section 15. The tensile requirements shall be the same as those for round wires of equal nominal area.



## 13. Rated Strength of Conductor

13.1 Calculations for rated strengths of 8000 "0" Temper, H1X, and H2X conductors shall be made on the basis of the strengths of the component wires using the nominal wire diameter for the noncompacted construction and the specified maximum and

**TABLE 2 Temperature Correction Factors for Conductor Resistance**

| ~~Temperature,° C~~Temperature, °C | Multiplying Factor for Conversion to 20°C |
|---|---|
| 0 | 1.088 |
| 5 | 1.064 |
| 10 | 1.042 |
| 15 | 1.020 |
| 20 | 1.000 |
| 25 | 0.980 |
| 30 | 0.961 |
| 35 | 0.943 |
| 40 | 0.925 |
| 45 | 0.908 |
| 50 | 0.892 |
| 55 | 0.876 |
| 60 | 0.861 |
| 65 | 0.846 |
| 70 | 0.832 |
| 75 | 0.818 |
| 80 | 0.805 |
| 85 | 0.792 |
| 90 | 0.780 |