



Standard Specification for Compact Round Concentric-Lay-Stranded Copper Conductors¹

This standard is issued under the fixed designation B496; 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 bare compact round concentric-lay-stranded conductors made from uncoated round copper wires for general use for electrical purposes. These conductors shall be constructed with a central core surrounded by one or more layers of helically laid compacted wires (Explanatory [Note 1](#) and [Note 2](#)).

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.2.1 For density, resistivity, and temperature, the values stated in SI units are to be regarded as standard.

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

[B3 Specification for Soft or Annealed Copper Wire](#)

[B263 Test Method for Determination of Cross-Sectional Area of Stranded Conductors](#)

[B354 Terminology Relating to Uninsulated Metallic Electrical Conductors](#)

3. Ordering Information

3.1 Orders for material under this specification shall include the following information:

3.1.1 Quantity of each size ([Table 1](#)),

3.1.2 Conductor size; circular-mil area or AWG, ([Section 6](#) and [Table 1](#)),

3.1.3 Packaging ([Section 15](#)), if required,

3.1.4 Special package marking, and

3.1.5 Place of inspection ([Section 14](#)).

4. Joints

4.1 Welds and brazes may be made in rods or in wires prior to final drawing.

4.2 Welds and brazes may be made in the individual round drawn wires for compact conductors, but shall not be closer together than 1 ft (300 mm) for conductor of 19 wires or less or closer than 1 ft (300 mm) in a layer for conductor of more than 19 wires.

4.3 No joint nor splice shall be made in a compact-stranded conductor as a whole.

5. Lay

5.1 The length of lay of the outer layer shall not be less than 8 nor more than 16 times the outside diameter of the completed conductor. The maximum length of lay for compact conductors AWG 2 (33.6 mm²) and smaller shall be 17.5 times the outside diameter of the conductor.

5.2 The direction of lay of the outer layer shall be left-hand, and it shall be reversed in successive layers, unidirectional, or unilay.

6. Construction

6.1 The construction of the compact round concentric-lay-stranded conductors shall be as shown in [Table 1](#).

6.2 The starting round copper wires used in the fabrication of the compact round conductor shall be of such diameter as to produce a finished conductor having a nominal cross-sectional area and diameter as prescribed in [Table 1](#).

7. Density

7.1 For the purpose of calculating linear densities, cross sections, and so forth, the density of the copper shall be taken as 8.89 g/cm³ (0.32117 lb/in.³) at 20°C.

8. Mass and Resistance

8.1 The mass per unit length and dc electrical resistance of a compact round conductor are greater than the total of these characteristics of the compressed wires composing the finished

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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 Document Summary page on the ASTM website.