



Standard Specification for Compact Round Stranded Copper Conductors Using Single Input Wire Construction¹

This standard is issued under the fixed designation B 835; 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 stranded conductors made from uncoated copper wires of a single input wire (SIW) diameter for general use in covered or insulated electrical wires or cables. These conductors shall be constructed with one or more layers of helically laid compacted wires (Explanatory Note 1, Note 2, and Note 3).

1.2 The values stated in inch-pound or SI units are to be regarded separately as standard. The values in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

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:

B 3 Specification for Soft or Annealed Copper Wire²

B 263 Test Method for Determination of Cross-Sectional Area of Stranded Conductors²

B 354 Terminology Relating to Uninsulated Metallic Electrical Conductors²

2.3 NIST Document:

NBS Handbook 100—Copper Wire Tables³

3. Classification

3.1 The conductors described in this specification are intended for subsequent insulation or covering. The classification of these conductors is SIW compact.

4. Ordering Information

4.1 Orders for material in accordance with this specification shall include the following information:

¹ This specification is under the jurisdiction of ASTM Committee B-1 on Electrical Conductors and is the direct responsibility of Subcommittee B01.04 on Conductors of Copper and Copper Alloys.

Current edition approved April 10, 2000. Published June 2000. Originally published as B 835 – 93. Last previous edition B 835 – 93.

² *Annual Book of ASTM Standards*, Vol 02.03.

³ Available from National Institute of Standards and Technology (NIST), Gaithersburg, MD 20899.

4.1.1 Quantity of each size (Table 1);

4.1.2 Conductor size, circular-mil area or AWG (Section 8);

4.1.3 Packaging (Section 15), if required;

4.1.4 Special package marking; and

4.1.5 Place of inspection (Section 14).

5. Requirements for Wires

5.1 Before stranding and compacting, the copper wire shall meet all of the requirements of Specification B 3.

6. Joints

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

6.2 Welds and brazes may be made in the individual wires for compact conductors, but they shall not be closer together than 1 ft (0.3 m) for conductor of 19 wires or less or closer than 1 ft (0.3 m) in a layer for conductor of more than 19 wires.

6.3 No joint or splice shall be made in a compact-stranded conductor as a whole.

7. Lay

7.1 The length of lay shall not be less than 8 or more than 16 times the outside diameter of the completed conductor.

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

7.3 Other lay requirements may be furnished upon special agreement between the manufacturer and the purchaser.

8. Construction

8.1 The construction of the compact round SIW stranded conductors shall be as given in Table 1.

8.2 Wires used in the fabrication of the compact round conductor shall be of such dimensions as to produce a finished conductor as prescribed in Table 1.

9. Density

9.1 For the purpose of calculating mass per unit length, 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.

9.2 The mass and electrical resistance of a unit length of stranded unsealed conductor are a function of the length of lay. The approximate mass and electrical resistance may be determined using the standard increments shown in Table 2. When greater accuracy is desired, the increment based on the specific