



Designation: B502 – 02 (Reapproved 2007)

Standard Specification for Aluminum-Clad Steel Core Wire for Aluminum Conductors, Aluminum-Clad Steel Reinforced¹

This standard is issued under the fixed designation B502; 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 round, aluminum-clad steel core wire used for mechanical reinforcement in the manufacture of aluminum conductors, aluminum-clad steel reinforced.

1.2 The values stated in inch-pound or SI units are to be regarded separately as the standard. Each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. For conductor sizes designated by AWG, the requirements in SI units have been numerically converted from corresponding values stated or derived in inch-pound units. For conductor sizes designated by SI units only, the requirements are stated or derived in SI units.

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

E8 Test Methods for Tension Testing of Metallic Materials

3. Ordering Information

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

3.1.1 Quantity of each size,

3.1.2 Wire size: diameter in inches (see 6.1)

3.1.3 Package size: (see 17.1),

3.1.4 Special packaging and package marking if required (see 16.1), and

3.1.5 Place of inspection if other than place of manufacture (see 14.1).

¹ This specification is under the jurisdiction of ASTM Committee B01 on Electrical Conductors and is the direct responsibility of Subcommittee B01.06 on Composite Conductors.

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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.

4. Materials and Manufacture

4.1 The base metal shall be steel produced by the open-hearth, electric-furnace, or basic-oxygen process and shall be of such composition that the finished clad wire shall have the properties and characteristics prescribed in this specification.

4.2 The aluminum used for cladding shall have a purity and quantity sufficient to meet thickness and resistance requirements of this specification (see 7.1 and 9.1).

5. Tensile Properties

5.1 *Requirements*—The aluminum-clad steel core wire shall conform to the tensile requirements prescribed in Table 1. In computing stress at 1 % extension and ultimate tensile strength, the actual diameter of the finished wire shall be used.

5.2 *Elongation Test*—The elongation shall be determined by an extensometer suitable for measuring elongation in 10.0 in. (250 mm) and equipped with a vernier or other instrument reading to 0.001 in. (0.025 mm). It shall be attached to the test specimen at a load equal to the initial tensile stress shown in Table 2. At this load the extensometer shall be adjusted to the initial setting shown in Table 2. Upon application of further load, the tension shall be read at an extensometer reading of 1.0 % to determine conformance with the requirement in Table 1. Further elongation shall be observed while applying a tension load to the specimen. The elongation thus determined shall be not less than 1.5 % in 10.0 in. (250 mm). A test in which the extensometer reading is less than 1.5 % shall be disregarded if the fracture occurs less than 1.0 in. (25 mm) from either attachment. In this case, another specimen from the same reel or coil shall be tested.

5.3 The tension tests shall be made in accordance with Test Methods E8. The method for determining elongation is described in the Procedures Section of Test Methods E8.

6. Dimensions and Permissible Variations

6.1 The size shall be expressed by the wire diameter in decimals of an inch to the nearest 0.0001 in. (0.003 mm).

6.2 Within the range of diameters included in Table 3 the wire shall not vary from the nominal diameter by more than the amounts shown in this table. In computing permissible variations, diameters shall be rounded to the nearest 0.0001 in. (0.003 mm).