



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

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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 units are to be regarded as the standard. The SI equivalents of the inch-pound units may be approximate.

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 193 Test Method for Resistivity of Electrical Conductor Materials²

E 8 Test Methods of Tension Testing of Metallic Materials³

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).

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).

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

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

³ *Annual Book of ASTM Standards*, Vol 03.01.

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 E 8. The method for determining elongation is described in the Procedures Section of Test Methods E 8.

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).

6.3 If accessible, one measurement shall be taken near each end and one near the middle of the coil or reel. In the case of reels, the center and one end may not be accessible and the prescribed measurement shall be taken along the length of the accessible material. If any of the selected coils or reels fail to conform to the requirements as prescribed in 6.2, all coils or reels shall be measured in the manner specified.

7. Thickness of Aluminum

7.1 The aluminum thickness at any point shall be not less