



Standard Specification for Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes¹

This standard is issued under the fixed designation B189; 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 lead-coated and lead-alloy-coated, round, soft or annealed copper wire for electrical purposes.

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. The SI values for density and resistivity are to be regarded as the standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* The hazard statement applies only to Section 6 of this specification.

2. Referenced Documents

2.1 The following documents of the issue in effect at the time of reference form a part of these methods to the extent referenced herein:

2.2 ASTM Standards:²

B49 Specification for Copper Rod Drawing Stock for Electrical Purposes

B193 Test Method for Resistivity of Electrical Conductor Materials

B258 Specification for Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors

2.3 NIST:

NBS Handbook 100 Copper Wire Tables³

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

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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.

³ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.

3. Ordering Information

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

- 3.1.1 Quantity of each size and type of coating;
- 3.1.2 Wire size: diameter in inches (see 5.3 and Table 1);
- 3.1.3 Type of coating (see Section 1);
- 3.1.4 Type of copper, if special (see 4.2);
- 3.1.5 Package size (see 8.1);
- 3.1.6 Special package marking, if required; and
- 3.1.7 Place of inspection (see 6.1).

4. Material

4.1 *Coating Material*—The coating material shall be commercially pure lead or a lead alloy. The lead alloy shall conform to the following requirements as to chemical composition as determined by analysis of samples from the coating bath:

Lead, min, %	25
Tin, max, %	75 ^A
Antimony, max, %	6

^A It is permissible to use alloying constituents other than those specified above to replace a portion of the tin.

4.2 *Copper-Base Metal*—The base metal shall be copper of such quality and purity that the finished product shall have properties and characteristics prescribed in this specification.

4.2.1 Copper of special qualities, forms, or types, as may be agreed upon between the manufacturer and the purchaser, and which will conform to the requirements prescribed in this specification may also be used.

NOTE 1—Specification B49 defines copper suitable for use.

5. General Requirements (See Section 9)

5.1 *Tensile Strength and Elongation (Explanatory Note 1)*—The coated wire shall conform to the requirements for elongation prescribed in Table 1. No requirements for tensile strength are specified. For wire whose nominal diameter is more than 0.001 in. (1 mil) greater than a size listed in Table 1, but less than that of the next larger size, the requirements of the next larger size shall apply.