



Standard Specification for Copper Rod for Electrical Purposes¹

This standard is issued under the fixed designation B49; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers the requirements for rod in diameters from ¼ to 1⅜ in. (6.4 to 35 mm) produced from high conductivity coppers listed in Table 1, namely, electrolytic tough-pitch, oxygen-free, or fire-refined high conductivity coppers, and are suitable for further fabrication into electrical conductors.

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.

1.3 The following safety hazards caveat pertains only to Section 13. *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.*

2. Referenced Documents

2.1 The following documents in the current issue of the Book of Standards form a part of this specification to the extent referenced herein and define materials suitable for use in rod manufacture:

2.2 ASTM Standards:²

- B5** Specification for High Conductivity Tough-Pitch Copper Refinery Shapes
- B115** Specification for Electrolytic Copper Cathode
- B170** Specification for Oxygen-Free Electrolytic Copper—Refinery Shapes
- B193** Test Method for Resistivity of Electrical Conductor Materials
- B224** Classification of Coppers

¹ This specification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.07 on Refined Copper.

Current edition approved April 1, 2016. Published May 2016. Originally approved in 1923. Last previous edition approved in 2015 as B49–15a. DOI: 10.1520/B0049-16.

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.

- B577** Test Methods for Detection of Cuprous Oxide (Hydrogen Embrittlement Susceptibility) in Copper
- B846** Terminology for Copper and Copper Alloys
- E8/E8M** Test Methods for Tension Testing of Metallic Materials
- E18** Test Methods for Rockwell Hardness of Metallic Materials
- E29** Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E53** Test Method for Determination of Copper in Unalloyed Copper by Gravimetry
- E478** Test Methods for Chemical Analysis of Copper Alloys
- E1606** Practice for Electromagnetic (Eddy Current) Examination of Copper and Aluminum Redraw Rod for Electrical Purposes
- E2575** Test Method for Determination of Oxygen in Copper and Copper Alloys

2.3 Other Document:³

- NBS Handbook 100** *Copper Wire Tables*

3. Terminology

3.1 For definitions of general terms relating to copper and copper alloys refer to Terminology **B846**.

4. Ordering Information

4.1 Orders for rod under this specification shall include the following information:

- 4.1.1 ASTM designation and year of issue,
- 4.1.2 Quantity of each size,
- 4.1.3 UNS designation and requirements of copper (Sections 5 – 10),
- 4.1.4 Finish (Sections 9 and 10),
- 4.1.5 Package with or without joints (see 5.3),
- 4.1.6 Rod diameter (see 9.2),
- 4.1.7 Inspection (Section 15),
- 4.1.8 Package size (see 19.1), and
- 4.1.9 Special package marking as agreed upon between the manufacturer and the purchaser (Section 19).

³ Available from National Technical Information Service (NTIS), 5301 Shawnee Rd., Alexandria, VA 22312, <http://www.ntis.gov>.

*A Summary of Changes section appears at the end of this standard