



Standard Specification for Medium-Hard-Drawn Copper Wire¹

This standard is issued under the fixed designation B 2; 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 Department of Defense.

1. Scope

1.1 This specification covers medium-hard-drawn round copper wire for electrical purposes (see Explanatory Note 1).

1.2 The SI values of density and resistivity are to be regarded as standard. For all other properties the inch-pound values are to be regarded as standard, and the SI 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 5 Specification for Electrolytic Tough-Pitch Copper Refinery Shapes²

B 49 Specification for Copper Redraw Rod for Electrical Purposes²

B 170 Specification for Oxygen-Free Electrolytic Copper—Refinery Shapes²

B 193 Test Method for Resistivity of Electrical Conductor Materials³

B 258 Specification for Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors³

2.3 Other Document:

NBS Handbook 100—Copper Wire Tables of the National Bureau of Standards⁴

3. Ordering Information

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

3.1.1 Quantity of each size,

3.1.2 Wire size: diameter in inches (see 5.1 and Table 1),

3.1.3 Type of copper, if special (see Section 4),

3.1.4 Package size (see 10.1),

3.1.5 Special package marking, if required, and

3.1.6 Place of inspection (Section 10).

4. Materials and Manufacture

4.1 The material shall be copper of such quality and purity that the finished product shall have the properties and characteristics prescribed in this specification.

NOTE 1—Specifications B 5, B 49, and B 170 define the materials suitable for use.

4.2 Copper bars 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.

5. Dimensions and Permissible Variations

5.1 The wire sizes shall be expressed as the diameter of the wire in decimal fractions of an inch to the nearest 0.0001 in. (0.1 mil) or in millimetres to the nearest 0.001 mm (Explanatory Note 2).

5.2 Within the range of diameters included in Table 1 the wire shall not vary from the specified diameter by more than $\pm 1\%$, expressed to the nearest 0.0001 in. (0.1 mil) 0.001 mm.

5.3 Ten percent, but not less than five coils or spools (or all if the lot is less than five) from any lot of wire shall be gaged at three places. If accessible, one gaging shall be taken near each end and one near the middle. If any of the selected coils or spools fails to conform to the requirements prescribed in 5.2, all coils or spools shall be gaged in the manner specified.

6. Workmanship, Finish, and Appearance

6.1 The wire shall be free from all imperfections not consistent with the best commercial practice.

7. Tensile Properties

7.1 The wire shall conform to the requirements as to tensile properties prescribed in Table 1 (Explanatory Note 2 and Note 3).

7.2 Tests on a specimen containing a joint shall show at least 95 % of the minimum tensile strength given in Table 1. Elongation tests shall not be made on a specimen containing a joint.

7.3 For wire the nominal diameter of which is more than 0.001 in. (1 mil) (0.025 mm) greater than a size listed in Table

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.

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² Annual Book of ASTM Standards, Vol 02.01.

³ Annual Book of ASTM Standards, Vol 02.03.

⁴ Available from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161.