Designation: B559 – 12

Standard Specification for Nickel-Coated, Copper-Clad Steel Wire for Electronic Application[1]

This standard is issued under the fixed designation B559; 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 nickel-coated, round, copper-clad steel wire for electronic application.

1.2 Nickel coatings in mass percentages of the total mass of the coated wire are as follows: 2, 4, 7, 10, and 27 %. Nickel-coated wire having different minimum mass percentages of nickel may be obtained by mutual agreement between the manufacturer and the purchaser. For information purposes, the thickness of coating in microinches provided by the percentages listed above is shown in Table 1.

1.3 Four classes of nickel-coated, copper-clad steel wire are covered as follows:

1.3.1 *Class N30HS*—Nominal 30 % conductivity, hard drawn.

1.3.2 *Class N30A*—Nominal 30 % conductivity, annealed.

1.3.3 *Class N40HS*—Nominal 40 % conductivity, hard drawn.

1.3.4 *Class N40A*—Nominal 40 % conductivity, annealed.

1.4 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.

1.4.1 *Exception*—The SI values for resistivity are to be regarded as standard.

1.5 The following safety hazards caveat pertains only to the test method described in this specification. *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.* (**Warning—**Consideration should be given to toxicity and flammability when selecting solvent cleaners.)

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

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

B452 Specification for Copper-Clad Steel Wire for Electronic Application

E75 Test Methods for Chemical Analysis of Copper-Nickel and Copper-Nickel-Zinc Alloys (Withdrawn 2010)[3]

2.3 *American Chemical Society:*[4]

Standard Reagents Tests

2.4 *NIST Standard:*[5]

NBS Handbook 100 *Copper Wire Tables*

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *lot*—any amount of wire of one class and size presented for acceptance at one time, such amount, however, not to exceed 10 000 lb (4500 kg) (Note 1).

NOTE 1—A lot should comprise material taken from a product regularly meeting the requirements of this specification. Inspection of individual lots of less than 500 lb (230 kg) of wire cannot be justified economically.

[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.

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] *Reagent Chemicals, American Chemical Society Specifications* , American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.

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

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