



Standard Specification for Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors¹

This standard is issued under the fixed designation B 258; 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 prescribes standard nominal diameters and cross-sectional areas of American Wire Gage (AWG) sizes of solid round wires, used as electrical conductors, and gives equations and rules for the calculation of standard nominal mass and lengths, resistances, and breaking strengths of such wires (Explanatory Note 1).

1.2 The SI values for density 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 ASTM Standards:

- A 111 Specification for Zinc-Coated (Galvanized) “Iron” Telephone and Telegraph Line Wire²
- A 326 Specification for Zinc-Coated (Galvanized) High Tensile Steel Telephone and Telegraph Line Wire²
- B 1 Specification for Hard-Drawn Copper Wire³
- B 2 Specification for Medium-Hard-Drawn Copper Wire³
- B 3 Specification for Soft or Annealed Copper Wire³
- B 9 Specification for Bronze Trolley Wire³
- B 33 Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes³
- B 47 Specification for Copper Trolley Wire³
- B 105 Specification for Hard-Drawn Copper Alloy Wires for Electrical Conductors³
- B 189 Specification for Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes³
- B 227 Specification for Hard-Drawn Copper-Clad Steel Wire³
- B 230 Specification for Aluminum 1350-H19 Wire for Electrical Purposes³
- B 314 Specification for Aluminum 1350 Wire for Communication Cable³
- B 396 Specification for Aluminum-Alloy 5005-H19 Wire for Electrical Purposes³

B 398 Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes³

B 415 Specification for Hard-Drawn Aluminum-Clad Steel Wire³

B 609 Specification for Aluminum 1350 Round Wire, Annealed and Intermediate Tempers, for Electrical Purposes³

B 800 Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes—Annealed and Intermediate Tempers³

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁴

F 205 Test Method for Measuring Diameter of Fine Wire by Weighing⁵

3. Standard Reference Temperature

3.1 For the purpose of this specification, all wire dimensions and properties shall be considered as occurring at the internationally standardized reference temperature of 20°C (68°F).

4. Standard Rules for Rounding

4.1 All calculations for the standard nominal dimensions and properties of solid round wires shall be rounded in the *final* value only, in accordance with rounding method of Practice E 29.

5. Standard Nominal Diameters

5.1 Standard nominal diameters of AWG sizes of solid round wires shall be calculated in accordance with the conventional mathematical law of the American Wire Gage (see Explanatory Note 1) and in accordance with Section 4.

5.2 For wire sizes 4/0 to 44 AWG, inclusive, nominal diameters shall be expressed in no more than four significant figures but in no case closer than the nearest 0.1 mil (0.0001 in.).

5.3 For wire sizes 45 to 56 AWG, inclusive, nominal diameters shall be expressed to the nearest 0.01 mil (0.00001 in.).

5.4 The standard nominal diameters expressed in mils have been calculated in accordance with these rules and are given in Table 1 for convenient reference (Explanatory Note 2).

¹ This specification is under the jurisdiction of ASTM Committee B-1 on Electrical Conductors and is the direct responsibility of Subcommittee B01.02 on Methods of Test and Sampling Methods.

Current edition approved Sept. 10, 1996. Published November 1996. Originally published as B 258 – 51 T. Last previous edition B 258 – 81 (1991).

² Annual Book of ASTM Standards, Vol 01.06.

³ Annual Book of ASTM Standards, Vol 02.03.

⁴ Annual Book of ASTM Standards, Vol 14.02.

⁵ Annual Book of ASTM Standards, Vol 10.04.