



Standard Specification for Solid Hard-Drawn Aluminum Wire for Electrical Purposes¹

This standard is issued under the fixed designation B 889; 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 solid hard-drawn aluminum wire manufactured for electrical applications.

1.2 This specification contains requirements that are not in accordance with Specification B 230.

1.3 This specification is a North American harmonized document. (Canada, Mexico, and the United States).

1.4 Products manufactured in compliance with this standard will also be in agreement with IEC 889.

1.5 This specification sets forth requirements in metric units.

1.6 The following precautionary statement pertains only to the test method portion, Section 13, of 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.*

2. Referenced Documents

2.1 The following documents form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*

B 230 Specification for Aluminum 1350-H19 Wire for Electrical Purposes²

2.3 *IEC Standard:*

IEC 889 Hard Drawn Aluminum Wire for Overhead Line Conductors³

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *lot*—a group of production units that was produced during the same time period, under similar production conditions, and is presented for acceptance at the same time.

3.1.2 *production unit*—a coil, reel, spool, or other package of wire that represents a single usable length.

3.1.3 *quality assessment procedure*—a procedure followed by the manufacturer that shows evidence of statistical control.

¹ This guide is under the jurisdiction of ASTM Committee B-1 on Electrical Conductors and is the direct responsibility of Subcommittee B01.07 on Conductors of Light Metals.

Current edition approved Sept. 10, 1998. Published November 1998.

² *Annual Book of ASTM Standards*, Vol 02.03.

³ 1991 IEC/CEI International Standard 1089.

3.1.4 *sample*—the production unit or units from which a test specimen or specimens has been removed, and that is considered to have properties representative of the lot.

3.1.5 *specimen*—a length of wire removed for test purposes.

4. Special Ordering Information

4.1 Orders for material described in this specification should contain the requirement “ASTM B 889” to ensure compliance with harmonized attributes.

5. Aluminum Redraw Rod

5.1 Aluminum rod used to draw wires to this specification must have an aluminum content of 99.5 % minimum.

5.2 The aluminum rod shall be suitable for the density tensile and resistivity properties as outlined in this specification.

6. Tensile Properties At 20° C

6.1 The minimum tensile strength of the drawn wire is shown in Table 1.

6.2 When requested by the purchaser, tension tests shall be made on samples of wire containing joints. The minimum tensile strength of the wire joint shall be 130 MPa.

7. Bending Properties

7.1 The wire shall not break when wrapped eight turns around a mandrel of equal diameter to the wire at a rate not to exceed 60 rev/min. Six turns shall then be unwrapped and again closely wrapped.

8. Resistivity

8.1 The electrical resistivity shall not exceed 28.264 n Ω m at 20°C.

9. Density

9.1 The density of the aluminum shall be 2703 kg/m³ at 20°C.

9.2 The value in 9.1 shall be used to calculate the conductor area and weight.

9.3 The performance value of weight is required to determine installation tensioning.

9.4 The performance value of area may be used to calculate ampacity. If specified by the purchaser, the electrical performance of the conductor may be judged by its d.c. resistance in

TABLE 1 Minimum Tensile Strength

Nominal Diameter (mm)		Minimum Tensile Strength (MPa)
Over	Through	
...	1.25	200
1.25	1.50	195
1.50	1.75	190
1.75	2.00	185
2.00	2.25	180
2.25	2.50	175
2.50	3.00	170
3.00	3.50	165
3.50	6.50	160

which case the area measurement is not required.

10. Diameter

10.1 The wire diameter shall be expressed in millimeters to two decimal places.

10.2 Wire diameters 3.00 mm and less shall not vary from the nominal diameter more than ± 0.03 mm. Wires over 3.00 mm shall not vary from nominal more than ± 1 %.

11. Joints

11.1 No joints are permitted in packages weighing less than 500 kg.

11.2 Not more than 10 % of the packages in any one consignment may contain a joint.

11.3 Packages containing a joint must be identified.

12. Sampling

12.1 One sample shall be taken from 10 % of packages in any one consignment.

12.2 Alternatively, the purchaser may accept the quality assessment procedure operated by the manufacturer.

12.3 Special sampling procedures may be the result of agreement between the purchaser and manufacturer as an alternative to 12.1 or 12.2, or both.

13. Test Methods

13.1 The nationally-recognized industry test methods of the country of manufacture shall be used to assess the products manufactured to this specification, unless otherwise agreed upon between the purchaser and manufacturer.

14. Inspection

14.1 Unless otherwise specified in the purchase contract, the manufacturer shall be responsible for the performance of all inspection and testing requirements.

14.2 The manufacturer shall afford the purchaser reasonable access to the manufacturer's facilities consistent with the purchaser's need to ensure compliance with this specification.

15. Packaging and Marking

15.1 Package sizes and types shall be as agreed upon by the manufacturer and the purchaser at the time of placing the individual orders.

15.2 Each coil, reel spool or other package shall bear a tag showing the manufacturer's name or trademark; the product identification as hard-drawn aluminum wire; the size, length, and net mass of the material. Additional information shall be as agreed upon by the manufacturer and the purchaser at the time of placing the individual orders.

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