



Designation: B 736 – 00

Standard Specification for Aluminum, Aluminum Alloy and Aluminum-Clad Steel Cable Shielding Stock¹

This standard is issued under the fixed designation B 736; 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 selected aluminum, aluminum-alloy and aluminum clad steel cable shielding stock, both uncoated and coated, for applications such as electrostatic or electromagnetic shielding for insulated power, control, instrumentation and communication cables (including coaxial cable).

NOTE 1—See B 694, Specification for Copper, Copper Alloy, and Copper-Clad Stainless Steel Sheet and Strip for Electrical Cable Shielding² for related standards for copper-based shielding materials.

1.2 The materials covered are the following:

Type of Material ^A	Coating
Aluminum 1060	none
Aluminum 1100	none
Aluminum 1145	none
Aluminum 1235	none
Alloy 3003	none
Aluminum 1060	polyolefin
Aluminum 1100	polyolefin
Aluminum 1145	polyolefin
Aluminum 1235	polyolefin
Alloy 3003	polyolefin
Aluminum 1060	vinyl resin
Aluminum 1100	vinyl resin
Aluminum 1145	vinyl resin
Aluminum 1235	vinyl resin
Alloy 3003	vinyl resin
Aluminum Clad Steel ^B	none
Aluminum Clad Steel ^B	polyolefin

^A Aluminum designations are in accordance with ANSI H35.1. The equivalent Unified Numbering System alloy designations are those shown preceded by A9, for example, A91100 for aluminum 1100 in accordance with Practice E 527.

^B Cladding ratio must be specified (see 5.4).

1.3 For acceptance criteria for inclusion of new aluminum and aluminum alloys in this specification, see Annex A2.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

¹ This specification is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

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² Annual Book of ASTM Standards, Vol 02.01.

1.5 The following precautionary caveat pertains only to the test method portion, Section 12, 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 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:

A 568/A 568M Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for³

B 193 Test Method for Resistivity of Electrical Conductor Materials⁴

B 557 Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products⁵

D 903 Test Method for Peel or Stripping Strength of Adhesive Bonds⁶

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁷

E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum Base Alloys⁸

E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition⁸

E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique⁸

E 527 Practice for Numbering Metals and Alloys (UNS)⁹

E 607 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique, Nitrogen Atmosphere¹⁰

³ Annual Book of ASTM Standards, Vol 01.03.

⁴ Annual Book of ASTM Standards, Vol 02.03.

⁵ Annual Book of ASTM Standards, Vol 02.02.

⁶ Annual Book of ASTM Standards, Vol 15.06.

⁷ Annual Book of ASTM Standards, Vol 14.02.

⁸ Annual Book of ASTM Standards, Vol 03.05.

⁹ Annual Book of ASTM Standards, Vol 01.01.

¹⁰ Annual Book of ASTM Standards, Vol 03.06.



E 716 Practices for Sampling Aluminum and Aluminum Alloys For Spectrochemical Analysis¹⁰

E 1251 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Argon Atmosphere, Point-to Plane, Unipolar Self-Initiating Capacitor Discharge¹⁰

2.3 American National Standards:

H35.1 Alloy and Temper Designation Systems for Wrought Aluminum⁵

H35.2 Dimensional Tolerances for Aluminum Mill Products⁵

B46.1 Surface Texture¹¹

3. Terminology

3.1 Definitions:

3.1.1 *cable shielding stock*—a rolled product, rectangular in cross section and form, of nominal thickness 0.004 in. (0.10 mm) through 0.019 in. (0.48 mm) in coils (rolls) or traverse wound on reels or spools, with sheared or slit edges for electrical cable shielding applications.

3.1.2 *cladding ratio*—ratio by percent thickness of the aluminum/steel/aluminum component layers; for example, 20/60/20.

3.1.3 *producer*—the primary manufacturer of the material.

3.1.4 *supplier*—includes only the category of jobbers and distributors as distinct from producers.

4. Ordering Information

4.1 Orders for material to this specification shall include the following information:

4.1.1 This specification designation (which includes the number, the year, and the revision letter, if applicable),

4.1.2 Quantity for each item, in pounds (kilograms),

4.1.3 Name of material (cable shielding),

4.1.4 Type of material (bare aluminum, coated aluminum, aluminum clad steel, or coated aluminum clad steel) (see 1.2),

4.1.5 Aluminum designation, when appropriate (see 1.2 and 5.3),

4.1.6 Cladding ratio, when appropriate (see 5.4),

4.1.7 Type of coating, class of coating and number of sides to be coated (see 1.2, 11.1 and Table 1),

4.1.8 Color of coated aluminum (see 11.3),

4.1.9 Temper when non-standard is required (see Section 9),

4.1.10 Dimensions (thickness and width),

4.1.11 How furnished: coils (rolls), traverse wound on reels or spools, etc.,

4.2 Additionally, orders for material to this specification shall include the following information when required by the purchaser:

4.2.1 Whether the resistivity test is required for any item (Section 13),

4.2.2 Core requirements (core material, inner core diameter, if required; see 17.2),

4.2.3 Coil dimension (outer coil diameter limitation, if required; see 17.2),

4.2.4 Weight of coils and packages (coil weights and package size limitations, if required; see 17.3),

4.2.5 Certification, if required (see Section 18),

4.2.6 Special tests or exceptions, if any.

5. General Requirements, Materials and Manufacture

5.1 The material and manufacturing methods used shall be such that the resulting products will conform to the properties and characteristics prescribed in this specification.

5.2 Cladding may be bonded to the base metal by any method that will produce a clad material that will conform to this specification.

5.3 For bare or coated aluminum, Aluminum 1100, 1145 and 1235 shall be understood to be interchangeable, unless otherwise agreed upon between the producer and purchaser.

5.4 Unless otherwise stated (4.1.6), the cladding ratio shall be the standard ratio listed in Table 2 and shall be expressed as xx/xx/xx, aluminum/steel/aluminum.

6. Responsibility for Quality Assurance

6.1 *Responsibility for Inspection and Tests*—Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements specified herein. The producer may use his own or any other suitable facilities for the performance of the inspection and test requirements specified herein, unless disapproved by the purchaser in the order or at the time of contract signing. The purchaser shall have the right to perform any of the inspections and tests set forth in this specification where such inspections are deemed necessary to assure that material conforms to prescribed requirements.

6.2 *Lot Definition*—An inspection lot shall consist of an identifiable quantity of the same material, temper, and nominal dimensions subjected to inspection at one time.

7. General Quality

7.1 All cable shielding stock shall be commercially flat and free of buckles; they shall be free of injurious surface defects and shall have an 80 μ in. (2.0 μ m) maximum roughness measurement (AA) per ANSI B46.1, unless otherwise agreed upon by the producer and purchaser. Unless otherwise specified, discoloration due to proper annealing shall not be a cause for rejection.

7.2 Each ordered item shall be examined to determine conformance to this specification with respect to general quality and package marking. On approval of the purchaser, however, the producer may use a system of statistical quality control for such examinations.

8. Chemical Composition

8.1 *Limits*—The aluminum for cable shielding shall conform to the chemical composition limits specified in Table 3. Conformance shall be determined by the producer by analyzing samples taken at the time the aluminum ingots are poured, or samples taken from the finished or semifinished product. If the producer has determined the chemical composition of the material during the course of manufacture, the producer shall not be required to sample and analyze the finished product.

¹¹ Available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.



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TABLE 1 Property Requirements for Coated Metals

Coating				Performance Requirements, lbf/in. (N/m), min			
Type No.	Description	Class	Sides Coated	Bonding to Metal (12.2)	Heat Sealability (12.3)	Lap-Shear (12.4)	Moisture Resistance (12.5)
I	Polyolefin	1	1	1.5 (260)	5.0 (875)	The coated metal tape fails in tension before the bond between coatings fails in shear.	1.5 (260)
		2	1	3.5 (610)	10.0 (1750)		3.5 (610)
			2				
II	Vinyl Resin	1	1	N/A	5.0 (875)		
			2				N/A

TABLE 2 Mechanical Property Limits^{A,B}

Aluminum Designation	Temper	Specified Thick-ness in. (mm)	Tensile Strength, ksi (MPa)		Yield Strength (0.2 % offset)		Elongation in 2 in. (51 mm) min, %
			min	max	ksi (MPa)		
					min	max	
1060	0	0.004–0.019 (0.10–0.50)	8.0 (55)	14.0 (95)	2.5 (15)	...	15
1100	0	0.004–0.019 (0.10–0.50)	11.0 (75)	15.5 (105)	3.5 (25)	...	15
1145	0	0.004–0.019 (0.10–0.50)	8.0 (55)	14.0 (95)	3.0 (20)	...	15
1235	0	0.004–0.019 (0.10–0.50)	8.0 (55)	14.0 (95)	3.0 (20)	...	15
3003	0	0.004–0.019 (0.10–0.50)	14.0 (95)	19.0 (130)	5.0 (35)	...	14
Aluminum Clad Steel							
Cladding ^C Ratio	Total Thickness in. (mm)						
33/33/33	Annealed ^D	0.009 (0.225)	20.0 (140)	34.0 (235)	18 (125)	...	15

^A To determine conformance to this specification, each value for tensile strength shall be rounded to the nearest 0.1 ksi and each value for elongation to the nearest 0.5 %, both in accordance with the round method of Practice E 29.

^B For aluminum and aluminum alloys, the basis for establishment of mechanical property limits is shown in Annex A1. The listed mechanical property limits are statistically valid only for material thicknesses of 0.006 in. and over (over 15 mm).

^C Other cladding ratios may be supplied when agreed upon between the producer and purchaser.

^D Specification A 568.

TABLE 3 Chemical Requirements^{A,B,C}

Aluminum Designation	Silicon	Iron	Copper	Manganese	Magnesium	Zinc	Vanadium	Titanium	Other Elements ^D		Aluminum ^E
									Each	Total ^F	
1060	0.25	0.35	0.05	0.03	0.03	0.05	...	0.03	0.03	...	99.60 min
1100	0.95 Si + Fe		0.05–0.20	0.05	...	0.10	...	...	0.05	0.15	99.00 min
1145	0.55 Si + Fe		0.05	0.05	0.05	0.05	0.05	0.03	0.03	...	99.45 min
1235	0.65 Si + Fe		0.05	0.05	0.05	0.10	0.05	0.06	0.03	...	99.35 min
3003	0.6	0.7	0.05–0.20	1.0–1.5	...	0.10	...	...	0.05	0.15	remainder

^A Limits are in weight (mass) percent maximum unless stated otherwise.

^B Analysis shall be made for the elements for which limits are shown in this table.

^C For purposes of determining conformance to these limits, an observed value or a calculated value attained from analysis shall be rounded-off to the nearest unit in the last righthand place of figures used in expressing the specified limit, in accordance with the rounding method of Practice E 29.

^D Others includes listed elements for which no specific limit is shown as well as unlisted metallic elements. The producer may analyze samples for trace elements not specified in the specification. However, such analysis is not required and may not cover all metallic Others elements. Should any analysis by the producer or the purchaser establish that an Others element exceeds the limit of Each or that the aggregate of several Others elements exceeds the limit of Total the material shall be considered nonconforming.

^E By difference.

^F Other Elements—Total shall be the sum of unspecified metallic elements 0.010 % or more, rounded to the second decimal before determining the sum.

NOTE 2—It is standard practice in the United States aluminum industry to determine conformance to the chemical composition limits prior to further processing of ingots into wrought products. Due to the continuous nature of the process, it is not practical to keep a specific ingot analysis identified with a specific quantity of finished material.

8.2 Aluminum cladding shall be, unless otherwise specified, an aluminum conforming in chemical composition to Aluminum 1100, 1145 or 1235 (Table 3). These aluminums shall be