



Standard Specification for Aluminum for Use in Iron and Steel Manufacture¹

This standard is issued under the fixed designation B 37; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This specification covers aluminum and aluminum alloys in the form of ingots, rods, or shot, designated as shown in Table 1, for use in the manufacture of iron and steel.

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

2. Referenced Documents

2.1 ASTM Standards:

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specification²

E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys³

E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition³

E 101 Test Method for Spectrographic Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique⁴

E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique³

E 607 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique, Nitrogen Atmosphere⁵

E 716 Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis⁵

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 Discharge⁵

3. Ordering Information

3.1 Orders for material under this specification shall include the following:

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

¹ This specification is under the jurisdiction of ASTM Committee B-7 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.01 on Aluminum Alloy Ingots and Castings.

Current edition approved Aug. 10, 1996. Published September 1996. Originally published as B 37 – 20. Last previous edition B 37 – 92.

² Annual Book of ASTM Standards, Vol 14.02.

³ Annual Book of ASTM Standards, Vol 03.05.

⁴ Discontinued. See 1995 Annual Book of ASTM Standards, Vol 03.05.

⁵ Annual Book of ASTM Standards, Vol 03.06.

TABLE 1 Chemical Limits

NOTE 1—Analysis shall be made only for copper, zinc, magnesium, silicon, and iron unless the determination of additional elements is required by the contract or order, or the presence of other elements in substantial concentration is indicated during the course of the analysis. In the latter case, the amount of these other elements shall be determined and the total of copper, zinc, magnesium, silicon and iron, and “other elements” shall not exceed the specified amount prescribed in the last column of the table. Unless otherwise specified in the contract or order, 0.2 % of any “other element” shall constitute a “substantial concentration.”

NOTE 2—The following applies to all specified limits in this table: For purposes of determining conformance to these limits, an observed value or a calculated value obtained from analysis shall be rounded to the nearest unit in the last right-hand place of figures used in expressing the specified limit in accordance with the rounding-off method of Practice E 29.

| Grade | Composition, % | | | | |
|-------|------------------------------|-------------|-----------|----------------|------------------------------|
| | Aluminum, min, by difference | Copper, max | Zinc, max | Magnesium, max | Total of All Impurities, max |
| 990A | 99.0 | 0.2 | 0.2 | 0.2 | 1.0 |
| 980A | 98.0 | 0.2 | 0.2 | 0.5 | 2.0 |
| 950A | 95.0 | 1.5 | 1.5 | 1.0 | 5.0 |
| 920A | 92.0 | 4.0 | 1.5 | 1.0 | 8.0 |
| 900A | 90.0 | 4.5 | 3.0 | 2.0 | 10.0 |
| 850A | 85.0 | 5.0 | 5.5 | 2.5 | 15.0 |

3.1.2 Grade of material (see Table 1),

3.1.3 Form of material (ingot, rod or shot),

3.1.4 Dimensional limitations for material,

3.1.5 The quantity in either pieces or pounds,

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

3.2.1 Special packaging (see Section 6),

3.2.2 If inspection is required at manufacturers plant (see Section 7).

4. Quality

4.1 The material covered by this specification shall be commercially uniform in quality, in freedom from dross, slag, hollow shells, and other harmful contamination. Hollow shells shall not exceed 10 % by count in a minimum sample of 340 shot. The surface of material in shot form shall be free from a heavy oxidized coating.

4.2 The density of shot shall not be less than 90 lb/ft³.

5. Chemical Composition

5.1 *Limits*—The material shall conform to the chemical composition limits specified in Table 1. Conformance shall be determined by the producer by analyzing samples from each cast taken at the time the ingots rod or shot produced or samples taken from the finished product. If the producer has determined the chemical composition of the material during the course of manufacture, he shall not be required to sample and analyze the finished product.

5.2 *Number of Samples*—The number of samples taken for determination of chemical composition shall be as follows:

5.2.1 When the metal is shipped in carload lots of the same grade and cast, not less than five samples shall be taken at random from the carload for sampling. If the shipment is in less than carload lots or in mixed grades, one sample shall be taken for each 6000 lb (2 700 kg) or fraction thereof.

5.2.2 A sample shall consist of an ingot or section of rod in the case of material in these forms. In the case of material in shot form, a sample shall consist of a thin chill-cast bar approximately ¼ in. (6 mm) in thickness made by melting a small representative lot of the shot. An acceptable alternate sample configuration is described in Practices E 716.

5.2.3 When samples are taken at the time the molten metal is made into shot, rod, or ingot, at least one sample shall be taken from each source of molten metal.

5.3 *Methods of Sampling*—Samples for determination of chemical composition shall be taken in accordance with one of the following methods:

5.3.1 Samples for chemical analysis shall be taken by drilling, sawing, milling, turning, or clipping a representative piece or pieces to obtain a prepared sample of not less than 75 g. Sampling shall be in accordance with Practice E 55.

5.3.2 Sampling for spectrochemical analysis shall be in accordance with Practices E 716. Samples for other methods of analysis shall be suitable for the form of material being analyzed and the type of analytical method used.

5.4 *Methods of Analysis*—The determination of chemical composition shall be made in accordance with suitable chemical (Test Methods E 34), or spectrochemical (Test Methods E 101, E 227, E 607 and E 1251) methods. Other methods may be used only when no published ASTM method is available. In case of dispute, the methods of analysis shall be agreed upon by the producer and purchaser.

6. Packaging, Marking, and Shipping

6.1 The material shall be packaged in such a manner as to prevent damage in ordinary handling and transportation. The type of packaging and gross weight of individual containers shall be left to the discretion of the producer unless otherwise agreed upon. Packaging methods and containers shall be so selected as to permit maximum utility of mechanical equipment in unloading and subsequent handling. Each package or container shall contain only one size and one grade of material when packed for shipment unless otherwise agreed upon between the purchaser and producer.

6.2 Each package or container shall be marked with the purchase order number, quantity, specification number, grade, gross and net weights, and the name of the producer.

6.3 Packages or containers shall be such as to ensure acceptance by common or other carriers for safe transportation at the lowest rate to the point of delivery.

7. Inspection

7.1 If the purchaser desires to make an inspection of the material at the producer's works where the material is made, it shall be so stated in the contract or purchase order.

7.2 If the purchaser elects to have inspection made at the producer's works, the manufacturer shall afford the inspector representing the purchaser all reasonable facilities to satisfy him that the material is being furnished in accordance with this specification. All tests and inspection shall be so conducted as not to interfere unnecessarily with the operation of the works.

8. Rejection

8.1 Material that does not conform to the requirements of this specification may be rejected, and if rejected, shall be replaced by the producer. The full weight of the rejected material shall be returned to the producer.

9. Rehearing

9.1 In the case of dissatisfaction regarding rejections based on quality or chemical composition requirements as specified in Sections 4 and 5, respectively, the manufacturer may make claim for a rehearing as a basis of arbitration within 15 calendar days after receipt by the producer of the rejection notification.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

This standard is copyrighted by ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (<http://www.astm.org>).