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Standard Specification for Aluminum for Use in Iron and Steel Manufacture¹

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1. Scope*

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

1.2 *Units*—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units, which units that are provided for information only and are not considered standard.

1.3 *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 *ASTM Standards:*²

B 275 Practice for Codification of Certain Nonferrous Metals and Alloys, Cast and Wrought

B 660 Practices for Packaging/Packing of Aluminum and Magnesium Products

B 881 Terminology Relating to Aluminum- and Magnesium-Alloy Products

D 3951 Practice for Commercial Packaging

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

E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys E55 Practice for Sampling Wrought

Nonferrous Metals and Alloys for Determination of Chemical Composition⁵

E88 Practice for Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition⁵

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

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

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 Test Method for Analysis of Aluminum and Aluminum Alloys by Atomic Emission Spectrometry

2.2 *Other Standards:*³

CEN EN 14242 Aluminum and Aluminum Alloys – Chemical Analysis – Inductively Coupled Plasma Optical Emission Spectral Analysis

3. Terminology

3.1 *Definitions*—Refer to Terminology B 881 for definitions of product terms used in this specification.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bar*—a form of aluminum deoxidizing product with a rectangular cross section, similar to the appearance of a brick.

3.2.2 *cone*—a form of aluminum deoxidizing product with a round flat base and a pointed end.

3.2.3 *deox*—a common or commercial term used in place of aluminum deoxidizing product.

3.2.4 *nugget*—a form of aluminum deoxidizing product with a non-uniform (lump) shape.

3.2.5 *shot*—a form of aluminum deoxidizing product with a spheroid appearance of a pellet.

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

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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* Vol 02.02, volume information, refer to the standard's Document Summary page on the ASTM website.

³ Annual Book of ASTM Standards, Vol 15.09.

⁵ Available from European Committee for Standardization, Central Secretariat (CEN), rue de Stassart 36, B1050 Brussels, Belgium., www.CEN.eu/esearch.

*A Summary of Changes section appears at the end of this standard.

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, reported, and the total of copper, zinc, magnesium, silicon, 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 % or more of any “other element” shall constitute a “substantial concentration” and require that element to be reported.

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

4. Ordering Information

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

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

4.1.2 Grade of material (see Table 1),

4.1.3 Form of material (ingot, bar, rod, cone, nugget or shot),

4.1.4 Any required dimensional or weight limitations for the material, and

4.1.5 The quantity in either pieces or pounds (kilograms).

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

4.2.1 Special packaging (see Section 7),

4.2.2 Whether Practices B 660 applies and, if so, the levels of preservation, packaging and packing required (see 7.4),

4.2.3 Whether Practice D 3951 applies (see 7.4),

4.2.4 If inspection is required at manufacturer’s plant (see Section 8),

4.2.5 Whether certificate of conformance is required (see 6.3 and 10.1), and

4.2.6 Whether a certified chemical analysis is required (see 6.3, 6.9, and 6.10 and 6.3.1).

5. Quality Assurance

5.1 Unless otherwise specified in the contract or purchase order, the producer shall be responsible for the performance of all inspections and test requirements specified herein. Unless disapproved by the purchaser, the producer may use his own or any other suitable facilities for the performance of the inspection and test requirements specified herein. 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 confirm that the material conforms to prescribed requirements.

5.2 All testing shall be performed in accordance to applicable ASTM test methods.

5.3 The material covered by this specification shall be free of dross, slag, and other harmful contamination.

5.4 *Shot:*

5.4.1 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.

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

6. Chemical Composition

6.1 *Limits*—The average analysis of each lot of material shall conform to the chemical composition limits specified in Table 1. Conformance shall be determined by the producer’s analysis of samples from each cast, with the average analysis determined from the analytical results of all samples taken for that cast (see 6.9). Analytical samples from each cast shall be taken at the time