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Standard Specification for Zinc Alloys in Ingot Form for Spin Casting¹

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1. Scope*

1.1 This specification covers zinc alloys in ingot form for remelting for the manufacture of Spin Castings as specified and designated, as shown in Table 1. Four alloy compositions are specified, designated as follows:

Common	UNS
Spin Casting Alloy SC-A	...
Spin Casting Alloy SC-B	...
Spin Casting Alloy SC-C	...
ZA-73	...

1.2 Zinc alloys #2, #3, #5, and ZA-8 specified in Specification B 240 are also used in the spin casting process.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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 become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer; 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 order acceptance form a part of this specification to the extent referenced herein:

2.2 ASTM Standards:²

B 240 Specification for Zinc and Zinc-Aluminum (ZA) Alloys in Ingot Form for Foundry and Die Castings

B 899 Terminology Relating to Non-ferrous Metals and Alloys

B 908 Practice for the Use of Color Codes for Zinc Casting Alloy Ingot

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

E 47 Test Methods for Chemical Analysis of Zinc Die-Casting Alloys³

E 88 Practice for Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition⁸

E 536 Test Methods for Chemical Analysis of Zinc and Zinc Alloys

E 634 Practice for Sampling of Zinc and Zinc Alloys for Optical Emission Spectrometric Analysis

2.3 ISO Standards:⁴

ISO 3815-1 Zinc and zinc alloys — Part 1: Analysis of solid samples by optical emission spectrometry

ISO 3815-2 Zinc and zinc alloys — Part 2: Analysis by inductively coupled plasma optical emission

3. Terminology

3.1 Terms shall be defined in accordance with Terminology B 899.

3.2 *Definitions of Terms Specific to This Standard:*

3.3 *spin casting, n*—a casting process in which molten metal is poured into a rubber, polymer, graphite or metal mold and spun centrifugally until solidified, also a product produced by such a process.

¹ This specification is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.04 on Zinc and Cadmium.

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

³ Withdrawn.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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

TABLE 1 Chemical and North American Color Code Requirements

	Alloy SC-A	Alloy SC-B	Alloy SC-C	ZA-73
Color Code ^A
Element ^B				
Aluminum	3.9–4.3	3.9–4.3	3.4–4.6	7.7–8.0
Magnesium	0.1–0.2	0.4–0.6	0.4–0.43	0.02–0.03
Copper	2.6–2.9	2.7–3.3	1.3–1.4	3.0–3.3
Iron, max	0.035	0.035	0.10	0.075
Lead, max	0.004	0.004	0.015	0.005
Cadmium, max	0.0030	0.0030	0.005	0.003
Tin, max	0.0015	0.0015	0.005	0.002
Nickel, max	0.02	...
Zinc	Remainder	Remainder	Remainder	Remainder

^A Per Practice B 908.

^B For purposes of acceptance and rejection, the observed value or calculated value obtained from analysis should be rounded to the nearest unit in the last right-hand place of figures, used in expressing the specific limit in accordance with the rounding procedure prescribed in Practice E 29.

4. Ordering Information

- 4.1 Orders for ingots under this specification shall include the following information:
- 4.1.1 Quantity in pounds,
 - 4.1.2 Alloy (Table 1),
 - 4.1.3 Size, if not the manufacturer's standard,
 - 4.1.4 Specification number and date,
 - 4.1.5 Source inspection (Section 7), and
 - 4.1.6 Marking (Section 9).

5. Materials and Manufacture

- 5.1 The alloys may be made by any approved process.
- 5.2 The material covered by this specification shall be of uniform quality and shall be free from dross or other harmful contamination.

6. Chemical Requirements

6.1 *Limits*—The alloy shall conform to the requirements as to chemical composition prescribed in Table 1. Conformance shall be determined by the producer by analyzing samples taken at the time the ingots are made. If the producer has determined the chemical composition of the metal during the course of manufacture, it shall not be required to sample and analyze the finished product.

6.2 In case of dispute, the following requirements shall apply:

- 6.2.1 *Number of Samples*—Samples for verification of chemical composition shall be taken as follows:
- 6.2.2 If the ingots are shipped in carload lots of the same alloy, not less than five (5) ingots shall be taken at random from the carload for sampling. If the shipment is less than a carload lot, one (1) sample ingot shall be taken from each 10 000 lb. or fraction thereof. When it is deemed necessary, a sample may be taken from each melt of 1000 lb. or more.

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

6.3.1 Samples for chemical analysis shall be taken from the material by drilling, sawing, milling, turning, or clipping a representative piece or pieces to obtain weight of prepared sample not less than 100 g. Sampling shall be in accordance with Practice E 88.

6.3.2 By agreement, an optional method of sampling for analysis may be by melting together representative portions of each ingot selected, and then sampling the liquid composite by casting suitable specimens for either spectrographic or chemical analysis.

6.4 *Method of Analysis*—~~The determination of chemical composition shall be made in accordance with suitable chemical (Test Method E536) or other methods. In case of dispute, the results secured by Test Method E536 only shall be the basis of acceptance.~~—The determination of chemical composition shall be made in accordance with suitable chemical (Test Methods E 536 or Test Methods E 47 for tin), suitable spectrochemical methods ISO 3815-1 and ISO 3815-2, or other methods. In case of dispute, the results should preferably be secured by Test Methods E 536 and Test Methods E 47 for tin only, or ISO 3815-1 or ISO 3815-2 and shall be the basis of acceptance.

6.5 Samples for spectrochemical and other methods of analysis shall be suitable for the form of material being analyzed and the type of analytical method used (for example, see Practice E 634).

7. Source Inspection

7.1 If the purchaser desires that his representative inspect or witness the inspection and testing of the product prior to shipment, such agreement shall be made by the purchaser and producer or supplier as part of the contract or purchase order.