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Standard Specification for Zinc Alloys in Ingot Form for Spin Casting¹

This standard is issued under the fixed designation B952/B952M; 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 zinc alloys in ingot form for remelting for the manufacture of Spin Castings as specified and designated, as shown in Table 1. Seven alloy compositions are specified, designated as follows:

Common	Traditional	UNS
Spin Casting Alloy SC-A	...	...
Spin Casting Alloy SC-B	...	...
Spin Casting Alloy SC-C	...	...
Spin Casting Alloy SC-D	HJ10	...
Spin Casting Alloy SC-E	HJ20	...
Spin Casting Alloy SC-F	HJ40	...
ZA-73	...	...

1.2 Zinc alloys #2, #3, #5, and ZA-8 specified in Specification B240 are also used in the spin casting process.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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

B240 Specification for Zinc and Zinc-Aluminum (ZA) Alloys in Ingot Form for Foundry and Die Castings

B899 Terminology Relating to Non-ferrous Metals and Alloys

B908 Practice for the Use of Color Codes for Zinc Casting Alloy Ingot

B949 Specification for General Requirements for Zinc and Zinc Alloy Products

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications E88

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

E536 Test Methods for Chemical Analysis of Zinc and Zinc Alloys E634

E634 Practice for Sampling of Zinc and Zinc Alloys by Spark Atomic Emission Spectrometry

2.3 ISO Standards:³

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 B899.

3.2 Definitions of Terms Specific to This Standard:

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 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	Alloy SC-D	Alloy SC-E	Alloy SC-F
Color Code ^A							
Element ^B							
Aluminum	3.9–4.3	3.9–4.3	3.4–4.6	7.7–8.0	3.2–3.8	3.2–3.8	3.25–3.75
Magnesium	0.1–0.2	0.4–0.6	0.4–0.43	0.02–0.03	0.15–0.30	0.45–0.75	0.45–4.75
Copper	2.6–2.9	2.7–3.3	1.3–1.4	3.0–3.3	1.2–1.8	2.5–3.25	4.25–4.75
Iron, max	0.035	0.035	0.10	0.075	0.035	0.075	0.035
Lead, max	0.004	0.004	0.015	0.005	0.004	0.005	0.004
Cadmium, max	0.0030	0.0030	0.005	0.003	0.003	0.003	0.003
Tin, max	0.0015	0.0015	0.005	0.002	0.002	0.003	0.002
Nickel, max	...	...	0.02	...	...	0.02	...
Zinc	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder

^A Per Practice B908.

^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 E29.

3.2.1 *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.

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);

4.1 Orders for zinc alloy ingot under this specification shall include information as specified in Specification B949, Section 4.

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. [4500 kg] or fraction thereof. When it is deemed necessary, a sample may be taken from each melt of 1000 lb. [450 kg] or more.

6.2 Chemical requirement procedures shall be in compliance with the provisions of Specification B949, Section 5.2.

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 E88.

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. Sampling procedures shall be in compliance with the provisions of Specification B949, Section 6.

6.4 *Method of Analysis*—The determination of chemical composition shall be made in accordance with suitable chemical Test Methods—Approved methods include: Test Methods E536, suitable spectrochemical methods ISO3815-1 and ISO3815-2, or other methods. In case of dispute, the results should preferably be secured by Test Methods E536 or ISO3815-1 or ISO3815-2 and shall be the basis of acceptance, ISO 3815-1, or ISO 3815-2.

NOTE 1—Test Methods E536 is not directly applicable to the alloys in Specification B952/B952M. ISO3815-1 and ISO3815-2 1—Test Methods E536 is directly applicable in an unmodified form, only to alloys 3, 5, and 7. ISO 3815-1 and ISO 3815-2 are generic methods applied to zinc and zinc alloys.