



Standard Specification for Zinc Alloys in Ingot Form for Slush Casting¹

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^{ε1} NOTE—Paragraph 9.3 was corrected editorially and a Summary of Changes section was added in July 2001.

1. Scope *

1.1 This specification covers commercial zinc alloys in ingot form for remelting for the manufacture of castings from the alloys as specified and designated as shown in Table 1.

1.2 Slush casting alloys are used primarily for the manufacture of lighting fixtures, lamp bases, and small statues.

1.3 This specification covers two zinc alloys which are specified and designated as follows:

UNS	ASTM
Z34510	Slush Casting Alloy A
Z30500	Slush Casting Alloy B

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 Data Sheet 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:

- B 899 Terminology Relating to Nonferrous Metals and Alloys²
- B 908 Practice for the Use of Color Codes for Zinc Casting Alloy Ingot²
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance With Specifications³
- E 47 Test Methods for Chemical Analysis of Zinc Die-Casting Alloys⁴
- E 88 Practice for Sampling Nonferrous Metals and Alloys

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 Annual Book of ASTM Standards, Vol 02.04.

³ Annual Book of ASTM Standards, Vol 14.02.

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

TABLE 1 Chemical and North American Color Code Requirements^{A,B}

Color Code ^C	Composition, %	
	UNS Z34510 Slush Casting Alloy A	UNS Z30500 Slush Casting Alloy B
Element	Black/Red	Black/Orange
Copper	0.2–0.3	0.1 max
Aluminum	4.50–5.00	5.25–5.75
Lead	0.007 max	0.007 max
Cadmium	0.005 max	0.005 max
Tin	0.005 max	0.005 max
Iron	0.100 max	0.100 max
Magnesium	0.010 max	0.010 max
Zinc	Remainder	Remainder

^AThe following applies to all specified limits in this table. For purposes of determining conformance with this specification, the observed or calculated value obtained from analysis shall be rounded off "to the nearest unit" in the last right-hand place of figures used in expressing the specified limit, in accordance with the rounding method of Practice E 29.

^BUNS designations were established in accordance with Practice E 527.

^CRefer to Practice B 908. (Note: Colors indicated are for North American applications.)

in Cast Form for Determination of Chemical Composition⁵
E 527 Practice for Numbering Metals and Alloys (UNS)⁶
E 536 Test Method for Chemical Analysis of Zinc and Zinc Alloys⁷

3. Terminology

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

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 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 Annual Book of ASTM Standards, Vol 03.05.

⁶ Annual Book of ASTM Standards, Vol 01.01.

⁷ Annual Book of ASTM Standards, Vol 03.06.

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

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, slag, or other harmful contamination. The ingot shall also be reasonably free of surface corrosion and adhering foreign matter.

6. Chemical Requirements

6.1 *Limits*—This 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, he 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:

6.2.1.1 If the ingots are shipped in carload lots of the same alloy, not less than five ingots shall be taken at random from the carload for sampling. If the shipment is less than a carload lot, one sample ingot shall be taken for each 10 000 lb (4 500 kg) or fraction thereof. When it is deemed necessary, a sample may be taken from each melt of 1 000 lb (450 kg) 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.

6.3.3 Sample may also be in the form of a separately cast spectrographic specimen taken from the same pour used to cast the ingot.

6.4 *Method of Analysis*—The determination of chemical composition shall be made in accordance with suitable chemical (Test Method E 536 or Test Method E 47 for tin) or other

methods. In case of dispute, the results secured by Test Method E 536 and Test Method E 47 for tin only shall be the basis of acceptance.

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.

7.2 When such inspection or witness of inspection and testing is agreed upon, the producer or supplier shall afford the purchaser's representative all reasonable facilities to satisfy him that the product meets the requirements of this specification. Inspection and tests shall be conducted so there is no unnecessary interference with the producer's operations.

8. Rejection and Rehearing

8.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing. If the rehearing establishes that the material does not conform to the requirements of this specification, as much of the rejected original material as possible shall be returned to the producer or supplier.

9. Identification Marking

9.1 All ingots shall be properly marked for identification with the producer's name or brand.

9.2 Each bundle or skid shall be identified with the producer's heat, lot, or other identification mark.

9.3 Each ingot, bundle or skid shall be marked with the appropriate Color Code for the alloy as per North American Requirements in Practice B 908.

10. Preparation for Delivery

10.1 *Packaging*—Unless otherwise specified, the ingot shall be packaged to provide adequate protection during normal handling and transportation. Each package shall contain only one alloy unless otherwise agreed upon.

11. Keywords

11.1 casting; casting alloys; gravity casting; permanent mold casting; slush casting; zinc; zinc alloys

SUMMARY OF CHANGES

This section contains the principal changes to the standard that have been incorporated since the last issue.

- (1) Practice B 908 was added to Referenced Documents.
- (2) North American Color Code Requirements added to Table 1.
- (3) Color Code requirement added to Identification Marking.

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