



Standard Specification for ACuZinc5¹ (Zinc-Copper-Aluminum) Alloy in Ingot Form for Die Castings²

This standard is issued under the fixed designation B 892; 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 ACuZinc5, a commercial zinc-copper-aluminum alloy (Z46540*), in ingot form for remelting for use in the production of castings.

1.2 *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:*

B 899 Terminology Relating to Nonferrous Metals and Alloys³

B 908 Practice for the Use of Color Codes for Zinc Casting Alloy Ingot³

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁴

E 47 Test Methods for Chemical Analysis of Zinc Die Casting Alloys⁵

E 88 Practice for Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition⁶

E 527 Practice for Numbering Metals and Alloys (UNS)⁷

¹ ACuZinc and ACuZinc5 are registered trade names of the General Motors Corporation.

² 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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*See **Table 1**, footnote A

³ *Annual Book of ASTM Standards*, Vol 02.04.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ Withdrawn; see 1998 *Annual Book of ASTM Standards*, Vol 03.05.

⁶ *Annual Book of ASTM Standards*, Vol 03.05.

⁷ *Annual Book of ASTM Standards*, Vol 01.01.

E 536 Test Method for Chemical Analysis of Zinc and Zinc Alloys⁶

E 634 Practice for Sampling of Zinc and Zinc Alloys for Optical Emission Spectrometric Analysis⁶

3. Terminology

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

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *die casting, n*—a casting process in which molten metal is injected under high velocity and pressure into a metal die and solidified, also a product produced by such a process. Alternately known as pressure die casting.

4. Ordering Information

4.1 Orders for ingot under this specification shall include the following information:

4.1.1 Quantity in pounds,

4.1.2 Chemical composition,

4.1.3 Size, if not manufacturer's standard,

4.1.4 Source inspection (Section 9), and

4.1.5 Marking (Section 11).

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 of harmful contamination.

6. Chemical Composition

6.1 The ingots shall conform to the requirements as to chemical composition prescribed in **Table 1**. Conformance shall be determined by the manufacturer by analyzing samples taken at the time the ingots are poured or samples taken from the ingots. Unless otherwise agreed in the contract or purchase order, sampling procedure will be the manufacturer's choice.

7. Sampling for Determination of Chemical Composition

7.1 In the event of a dispute, 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

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

**TABLE 1 ACuZinc5 Chemical and North American Color Code Requirements**

Composition, % Z46540 ^A	
Color Code ^B	Red
Elements	
Copper	5.2 - 6.0
Aluminum	2.8 - 3.3
Magnesium	0.035 - 0.050
Iron	0.05 max
Lead	0.004 max
Cadmium	0.003 max
Tin	0.002 max
Zinc	Remainder ^C

^AUNS Alloy designation has been established in accordance with Practice E 527^BRefer to Practice B 908.^CDetermined arithmetically by difference.

each 10 000 lb (4500 kg) or fraction thereof. Either party may request that a sample be taken from each melt of 1000 lb (450 kg) or more.

7.2 The sample for chemical analysis shall be taken by sawing, milling, or drilling in such a manner as to be representative of the average cross section of the ingot. The weight of a prepared sample shall be not less than 75 g in accordance with Practice E 88.

7.3 The saw, drill or cutter used for taking the sample shall be thoroughly cleaned. No lubricant shall be used in the operation, and the sawings or metal chips shall be carefully treated with a magnet to remove any particles of iron introduced in taking the sample by the method prescribed in 7.2.

7.4 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.

7.5 *Samples for Spectrochemical and Other Methods of Analysis*—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.

8. Methods of Chemical Analysis

8.1 The determination of chemical composition shall be made in accordance with suitable chemical (Test Methods E 536 or 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, or by a method agreed upon by both parties, shall be the basis of acceptance.

8.2 For purposes of determining compliance with specified composition limits as given in Table 1, an observed or calculated value shall be rounded to the nearest unit in the last right-hand place of figures shown in Table 1, in accordance with the rounding method of Practice E 29.

9. Source Inspection

9.1 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.

9.2 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.

10. Rejection and Rehearing

10.1 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.

11. Identification Marking

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

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

11.3 Each ingot, bundle or skid shall be marked with the red Color Code for this Zn-Cu-Al alloy as per North American requirements in Practice B 908.

12. Certification

12.1 When specified in the purchase order or contract, a producer's or supplier's certification shall be furnished to the purchaser that the material was manufactured, sampled, tested, and inspected in accordance with this specification and has been found to meet the requirements. When specified in the purchase order or contract, a report of the test results shall be furnished.

13. Preparation for Delivery

13.1 *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.

14. Keywords

14.1 ACuZinc; ACuZinc5; Casting alloys; die casting alloys; zinc; zinc alloys; zinc - copper - aluminum alloys



SUMMARY OF CHANGES

Committee B02 has identified the location of selected changes to this standard since the last issue (B 892 - 01^{e1}) that may impact the use of this standard.

(1) Addition of trade name ACuZinc5 and die casting definition.

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