Designation: E 47 – 93

AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race St. Philadelphia, Pa 19103

Standard Test Methods for Chemical Analysis of Zinc Die-Casting Alloys[1]

This standard is issued under the fixed designation E 47; 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 These test methods cover procedures for the chemical analysis of zinc die-casting alloys having chemical compositions within the following limits:

Lead	0.001 to 0.1
Aluminum	0.1 to 5
Copper	0.01 to 5
Magnesium	0.01 to 0.2
Cadmium	0.001 to 0.1
Iron	0.005 to 0.2
Tin	0.001 to 0.1

1.2 The analytical procedures appear in the following order:

	Sections
Lead:	
Electrolytic Method	2
Dithizone (Photometric) Method	3
Aluminum by the Oxide or 8-Hydroxyquinoline Method	2
Copper:	
Electrolytic and Iodide Methods	3
Hydrobromic Acid (Photometric) Method	2
Magnesium:	
Mercury Cathode Separation Method	2
Diammonium Phosphate Method	2
Cadmium by the Sulfide Method	2
Iron by the Permanganate Method	2
Tin by the Iodine Titration Method	37 to 40

1.3 *This standard does not purport to address all of the safety problems, 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.* For specific hazards to be observed, refer to Practices E 50.

2. Referenced Documents

2.1 *ASTM Standards:*

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications[4]

E 50 Practices for Apparatus, Reagents, and Safety Precautions for Chemical Analysis of Metals[5]

E 88 Practice for Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition[5]

E 536 Test Method for Chemical Analysis of Zinc and Zinc Alloys[6]

3. Significance and Use

3.1 These test methods for the chemical analysis of metals and alloys are primarily intended to test such materials for compliance with compositional specifications. It is assumed that all who use these methods will be trained analysts capable of performing common laboratory procedures skillfully and safely. It is expected that work will be performed in a properly equipped laboratory.

4. Apparatus and Reagents

4.1 Apparatus and reagents required for each determination are listed in separate sections preceding the procedure. The apparatus, standard solutions, and certain other reagents used in more than one procedure are referred to by number and shall conform to the requirements prescribed in Practices E 50.

5. Sampling

5.1 Zinc-base die-casting alloys shall be sampled in accordance with Practice E 88.

6. Rounding Calculated Values

6.1 Calculated values shall be rounded to the desired number of places in accordance with the rounding method given in the Rounding-Off Method section of Practice E 29.

LEAD BY THE ELECTROLYTIC TEST METHOD

(This test method, which consisted of Sections 7 through 9 of these test methods, was discontinued in 1977 and replaced by appropriate test methods in Test Method E 536.)

LEAD BY THE DITHIZONE (PHOTOMETRIC) TEST METHOD

(This test method, which consisted of Section 10 of these test methods, was discontinued in 1993 and replaced by appropriate test methods in Test Method E 536.)

ALUMINUM BY THE OXIDE OR 8-HYDROXYQUINOLINE TEST METHOD

(This test method, which consisted of Sections 11 through 13 of these test methods, was discontinued in 1977 and replaced by appropriate test methods in Test Method E 536.)

[1] These test methods are under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry for Metals, Ores, and Related Materials and are the direct responsibility of Subcommittee E01.05 on Zinc, Tin, Lead, Cadmium, Beryllium and Other Metals.

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[2] Discontinued as of Dec. 15, 1977.

[3] Discontinued as of Jan. 15, 1993.

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

[5] *Annual Book of ASTM Standards*, Vol 03.05.

[6] *Annual Book of ASTM Standards*, Vol 03.06.