



Standard Specification for GALFAN¹ (Zinc-5 % Aluminum-Mischmetal) Alloy in Ingot Form for Hot-Dip Coatings²

This standard is issued under the fixed designation B750; 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 GALFAN, zinc-5 % aluminum-mischmetal (Zn-5Al-MM) alloy (UNS Z38510)³ in ingot form for remelting for use in the production of hot-dip coatings on steel. Alloy composition is specified in **Table 1**.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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 ASTM Standards:⁴

B899 Terminology Relating to Non-ferrous Metals and Alloys

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

E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

E1277 Test Method for Chemical Analysis of Zinc-5 % Aluminum-Mischmetal Alloys by ICP Emission Spectrometry

2.2 Other Standard:⁵

GF-1 Standard Practice for Determination of Cerium and Lanthanum Compositions in GALFAN Alloy (5 % -0.04 % La-0.04 % Ce-Bal SHG Zn)

2.3 ISO Standards:⁶

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 spectrometry

3. Terminology

3.1 Terms shall be defined in accordance with Terminology **B899**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *mischmetal, n*—a naturally occurring mixture of rare-earth elements in metallic form, primarily cerium and lanthanum.

3.3 Abbreviations:

3.3.1 MM—mischmetal.

3.3.2 Zn-5Al-MM—zinc-5 % aluminum mischmetal.

4. Ordering Information

4.1 Orders for ingot under this specification shall include the relevant information as listed 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 free from dross, slag, or other harmful contamination.

6. Chemical Composition

6.1 *Limits*—The alloys shall conform to the requirements as to chemical composition prescribed in **Table 1**. Conformance

¹ GALFAN is a registered trademark of the GALFAN Information Center, Inc.

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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³ UNS number in conformance with Practice **E527**.

⁴ 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.

⁵ Available from International Lead Zinc Research Organization, 2525 Meridian Parkway, P.O. Box 12036, Research Triangle Park, NC 27709 – 2036, <http://www.ilzro.org>.

⁶ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

TABLE 1 GALFAN, Zn-5Al-MM Alloy Ingot Chemical Requirements^{A,B,C,D,E}

Element	UNS Z38510 Composition, %
Aluminum ^F	4.2–6.2
Cerium + lanthanum, total	0.03–0.10
Iron, max	0.075
Silicon, max	0.015
Lead ^G , max	0.005
Cadmium ^G , max	0.005
Tin ^G , max	0.002
Others ^H , each, max	0.02
Others ^H , total, max	0.04
Zinc	Remainder

^A 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 specified limit, in accordance with the rounding procedure prescribed in Section 3 of Practice E29.

^B By agreement between purchaser and supplier, analysis may be required and limits established for elements or compounds not specified in the table of chemical composition.

^C GALFAN, Zn-5Al-MM alloy ingot for hot-dip coatings may contain antimony, copper, and magnesium in amounts of up to 0.002, 0.1, and 0.05 %, respectively. No harmful effects have ever been noted due to the presence of these elements up to these concentrations and, therefore, analyses are not required for these elements.

^D Magnesium may be specified by the buyer up to 0.1 % maximum.

^E Zirconium and titanium may each be specified by the buyer up to 0.02 % maximum.

^F Aluminum may be specified by the buyer up to 12 % maximum.

^G Lead and cadmium, and to a lesser extent tin and antimony, are known to cause intergranular corrosion in zinc-aluminum alloys. For this reason it is important to maintain the levels of these elements below the limits specified.

^H Except antimony, copper, magnesium, zirconium, and titanium.

shall be determined by the producer by analyzing samples taken at the time 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.

7. Sampling

7.1 See appropriate requirements in Section 6 of Specification B949.

8. Analytical Methods

8.1 *Method of Analysis*—The determination of chemical composition shall be made in accordance with ICP argon

plasma spectrometric (Test Method E1277) or other methods (including spectrochemical methods ISO 3815-1 or ISO 3815-2. In case of dispute, the results secured by Test Method E1277 shall be the basis of acceptance.

8.2 A standard practice for X-ray fluorescence spectrometry for determination of cerium and lanthanum in a zinc-5 % aluminum alloy has been established by the International Lead Zinc Research Organization (Standard Practice GF-1). In case of dispute, the results secured by Test Method E1277 shall be the basis of acceptance.

9. Inspection

9.1 See Section 9 of Specification B949.

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.

10.2 For additional information see Specification B949, Section 8.

11. Certification

11.1 See Section 9 of Specification B949.

12. Product Marking

12.1 See Section 10 of Specification B949.

13. Packaging and Package Marking

13.1 See Section 10 of Specification B949.

14. Keywords

14.1 GALFAN; hot dip coating alloy; zinc alloy; zinc-5 % aluminum mischmetal alloy

SUMMARY OF CHANGES

Committee B02 has identified the location of selected changes to this standard since the last issue (B750 - 09) that may impact the use of this standard. (Approved May 1, 2012.)

(1) Revisions have been made to Sections 2, 4, 7, 9, 10, 11, 12 and 13 to reference Specification B949 and deletion of certain sections of these sections formerly a part of this standard.

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