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

This standard is issued under the fixed designation B 750; 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 the standard. The values stated in parentheses are for information only.~~

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

B 899 Terminology Relating to Non-ferrous Metals and Alloys

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

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 Composition

E 527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

E 1277 Test Method for Chemical Analysis of Zinc-5 % Aluminum-Mischmetal Alloys by ICP Emission Spectrometry

2.2 Other Standard:⁶

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

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 E 527.

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 Withdrawn.

⁶ Available from International Lead Zinc Research Organization, 2525 Meridian Parkway, P.O. Box 12036, Research Triangle Park, NC 27709 – 2036, <http://www.ilzro.org>.

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

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 E 29.

^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.

2.3 ISO Standards:⁷

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 B 899.

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 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 year of issue,

4.1.5 Inspection (Section 9), and

4.1.6 Product marking (Section 12).

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