Designation: B852 – 16

Standard Specification for Continuous Galvanizing Grade (CGG) Zinc Alloys for Hot-Dip Galvanizing of Sheet Steel[1]

This standard is issued under the fixed designation B852; 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 grades of zinc alloys, commonly known as Continuous Galvanizing Grade (CGG) alloys that contain aluminum, or aluminum and lead, that are used in continuous hot-dip galvanizing of steel sheet. The compositions for CGG grades made from primary zinc are shown in Table 1. Exceptions for grades made from secondary zinc are found in footnote C.

1.2 CGG alloys specified in Specification B852 are used in continuous hot-dip galvanizing of steel sheet to produce product, as specified in Specification A653/A653M.

1.3 Other alloy compositions not included in B852, and as may be agreed upon between the producer and the user, may be used for continuous galvanizing.

1.4 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.

1.5 *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 Safety Data Sheet (SDS) 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:*[2]

A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

B897 Specification for Configuration of Zinc and Zinc Alloy Jumbo, Block, Half Block, and Slab Ingot

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)

E536 Test Methods for Chemical Analysis of Zinc and Zinc Alloys

E634 Practice for Sampling of Zinc and Zinc Alloys by Spark Atomic Emission Spectrometry

2.2 *ISO Standards:*[3]

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.

4. Ordering Information

4.1 Orders for zinc alloy ingot under this specification shall include information as specified in Specification B949.

5. Materials and Manufacture

5.1 The producer shall use care that each shipment of CGG alloy be as uniform in quality as possible.

6. Chemical Requirements

6.1 CGG alloy shall conform to the requirements of Table 1 as determined by chemical analysis by the producer on samples taken at his plant (see Section 9).

[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] 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.

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

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

TABLE 1 Chemical Requirements

Grade[A] (UNS)	Composition,%			
	Nominal		Range[B]	
	Aluminum	Lead	Aluminum	Lead[C]
Z80310	0.25	...	0.22 to 0.28	0.007 max
Z80411	0.35	...	0.31 to 0.39	0.007 max
Z80511	0.45	...	0.40 to 0.50	0.007 max
Z80531	0.45	0.02	0.40 to 0.50	0.01 to 0.03
Z80610	0.55	...	0.49 to 0.61	0.007 max
Z80710	0.65	...	0.58 to 0.72	0.007 max
Z80810	0.75	...	0.67 to 0.83	0.007 max
Z80910[D]	1.00	...	0.90 to 1.10	0.007 max
Z80XXX	0.005	...	0.001 to 0.01	0.007 max[E]

Impurities, %:	Iron[C]	0.0075 max[E]
	Cadmium	0.01 max
	Copper	0.01 max
	Other Elements	total of 0.01 max
Zinc:		balance by difference

[A] UNS numbers in conformance with Practice E527.
[B] For purposes of determining conformance with this specification, an observed value obtained from analysis shall be rounded to the nearest unit in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding method of Practice E29.
[C] Lead and Iron levels of 0.01 % max and 0.01 % max respectively are allowed for CGG alloys produced from secondary zinc.
[D] UNS Z80910 continuous galvanizing grade (CGG) alloy is primarily used to change the galvanizing pot chemistry to transition from galvanneal to galvanized production.
[E] Lead and Iron levels produced for secondary zinc are each 0.01 %.

6.2 Chemical requirement procedures shall be in compliance with the provisions of Specification B949.

7. Size and Shape

7.1 CGG alloy may be ordered as either jumbos, blocks, or slabs.

7.1.1 CGG alloy metal may be ordered in jumbos or blocks, as specified in Specification B897.

7.1.2 *Jumbos*—large castings of zinc or zinc alloy designed for handling by mechanical equipment. A jumbo usually weighs about 2400 lb (1087 kg). Jumbo shapes may vary, depending on the producer's practice, and may be referred to as strip jumbos or as block jumbos. The nominal weight, dimensions, and location of holes or openings shall be as agreed upon between the producer and the customer.

7.1.3 *Slabs*—smaller castings of zinc or zinc alloy designed for manual handling, but often handled by mechanical equipment. A slab usually weighs about 55 lb (25 kg) but may weigh anywhere from 40 to 60 lb (18 to 27 kg). Slabs are usually shipped in strapped bundles weighing about 2200 lb (one metric ton). Other bundle weights may be as agreed upon between the producer and the customer.

7.1.4 Other shapes and sizes as may be agreed upon between the producer and the customer may be cast to the chemical requirements (Table 1) of this specification.

8. Appearance

8.1 See Specification B949.

9. Sampling for Chemical Analysis

9.1 See Specification B949.

10. Methods of Chemical Analysis

10.1 The determination of chemical composition shall be made in accordance with Test Methods E536, or ISO 3815-1, or ISO 3815-2 or other methods. In case of dispute, the results secured by Test Methods E536, or ISO 3815-1, or ISO 3815-2 shall be the basis of acceptance.

NOTE 1—Test Methods E536 is directly applicable, in an unmodified form. ISO 3815-1 and ISO 3815-2 are generic methods applied to zinc and zinc alloys. Each of the methods may be modified and formatted for the alloy to be assayed. An experienced chemist, using suitable and/or traceable standards along with valid quality assurance techniques, will be able to perform and validate the methods and demonstrate acceptable precision and accuracy.

11. Rejection and Rehearing

11.1 See Specification B949.

12. Investigation of Claims

12.1 See Specification B949.

13. Settlement of Claims

13.1 See Specification B949.

14. Product Identification Marking and Packaging

14.1 See Specification B949.

15. Keywords

15.1 CGG alloy; Continuous Galvanizing Grade Zinc; zinc; zinc alloy; zinc metal

SUMMARY OF CHANGES

Committee B02 has identified the location of selected changes to this standard since the last issue (B852–14) that may impact the use of this standard. (Approved May 1, 2016.)

(1) A new alloy was added to Table 1.
(2) References to section numbers in Specification B949 were eliminated.