



Designation: B252 – 92 (Reapproved 2009)

Endorsed by American
Electroplaters' Society
Endorsed by National
Association of Metal Finishers

Standard Guide for

Preparation of Zinc Alloy Die Castings for Electroplating and Conversion Coatings¹

This standard is issued under the fixed designation B252; 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 guide is intended as an aid in establishing and maintaining a procedure for preparing zinc alloy die castings for electroplating and conversion coatings. It is primarily intended for the preparation of Alloys UNS Z33521 (AG-40A) and UNS Z35530 (AC-41A) (Specification B86) for electroplating with copper, nickel, and chromium (Specification B456).

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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 establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

B6 Specification for Zinc

B86 Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings

B456 Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium

2.2 *Military Standard:*

MIL-S-13165C Shot Peening of Metal Parts³

¹ This guide is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.02 on Pre Treatment.

Current edition approved Sept. 1, 2009. Published December 2009. Originally approved in 1951. Last previous edition approved in 2004 as B252 – 92 (2004). DOI: 10.1520/B0252-92R09.

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 Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

3. Summary of Practice

3.1 The normal sequence of preparation steps is as follows: (1) smoothing of parting lines; (2) smoothing of rough or defective surfaces, if necessary; (3) buffing, if necessary; (4) precleaning and rinsing; (5) alkaline electrocleaning and rinsing; (6) acid dipping and rinsing; and (7) copper striking.

4. Significance and Use

4.1 The performance and quality of electroplated or conversion-coated zinc alloy die casting depends upon the surface cleanliness and condition. Various metals are electroplated or conversion coatings are established on zinc alloys for decorative or engineering finish. The common electroplates applied are usually copper, nickel, and chromium for decorative and functional uses. The common conversion coatings applied are phosphates, chromates, and anodized coatings. Electroplated zinc die castings and conversion coatings on zinc die castings are used in many industries such as the marine, automotive, plumbing fixtures, and appliance industries.

5. Composition and Characteristics of Zinc Alloy Die Castings

5.1 The alloys used in the manufacture of zinc alloy die castings are made with special high-grade zinc conforming to Specification B6, alloyed with about 4 % of aluminum, 0.04 % of magnesium, and either 0.25 (max) or 1.0 % copper (Alloys UNS Z33521 and UNS Z35530). Impurities such as lead, cadmium, tin, and iron are held at or below the specified low levels in Specification B86.

5.2 Die castings made of Alloys UNS 233521 and UNS 235530 are usually dense and fine grained but do not always have smooth surfaces. Defects sometimes encountered in the surface layers include cracks, crevices (cold shut), skin blisters, and hemispherical pores. Burrs are usually left at parting lines where fins and gates are removed by die trimming.

5.3 Cast surfaces are frequently contaminated with parting compounds applied at frequent intervals to die surfaces to



B252 – 92 (Reapproved2009)

facilitate the ejection of the castings and with water-soluble oils added to quenching tanks for corrosion inhibition.