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Standard Guide for Preparation of Aluminum Alloys for Electroplating¹

This standard is issued under the fixed designation B253; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This guide covers cleaning and conditioning treatments used before metal deposition (Section 5), and immersion deposit/strike procedures (Section 6) that enhance the adhesion of metals that are subsequently applied to aluminum products by electrodeposition or by autocatalytic chemical reduction.

1.2 The following immersion deposit/strike procedures are covered:

- 1.2.1 Zinc immersion with optional copper strike (6.3).
- 1.2.2 Zinc immersion with neutral nickel strike (6.4).
- 1.2.3 Zinc immersion with acetate-buffered, nickel glycolate strike (6.5).
- 1.2.4 Zinc immersion with acid or alkaline electroless nickel strike.
- 1.2.5 Tin immersion with bronze strike (6.6).

1.3 From the processing point of view, these procedures are expected to give deposits on aluminum alloys that are approximately equivalent with respect to adherence. Corrosion performance is affected by many factors, however, including the procedure used to prepare the aluminum alloy for electroplating.

1.4 This guide is intended to aid electroplaters in preparing aluminum and its alloys for electroplating.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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.* For specific precautionary statements see Section 7 and Appendix X1.

1.7 *This international standard was developed in accordance with internationally recognized principles on standard-*

ization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*²

- B85 Specification for Aluminum-Alloy Die Castings
- B179 Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes
- B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- B209M Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
- B221 Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
- B221M Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
- B322 Guide for Cleaning Metals Prior to Electroplating
- B432 Specification for Copper and Copper Alloy Clad Steel Plate
- E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

3. Significance and Use

3.1 Various metals are deposited on aluminum alloys to obtain a decorative or engineering finish. The electroplates applied are usually chromium, nickel, copper, brass, silver, tin, lead, cadmium, zinc, gold, and combinations of these. Silver, tin, or gold is applied to electrical equipment to decrease contact resistance or to improve surface conductivity; brass, copper, nickel, or tin for assembly by soft soldering; chromium to reduce friction and obtain increased resistance to wear; zinc for threaded parts where organic lubricants are not permissible; tin or lead is frequently employed to reduce friction on bearing surfaces. Nickel plus chromium or copper plus nickel plus chromium is used in decorative applications. Nickel plus brass plus lacquer or copper plus nickel plus brass plus lacquer is

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.

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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.