



Standard Specification for Electrodeposited Coatings of Tin¹

This standard is issued under the fixed designation B545; 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 Department of Defense.

1. Scope

1.1 This specification covers the requirements for electrodeposited (electroplated) coatings of tin applied to metallic articles. Tin coatings are used to provide a low contact-resistance surface, to protect against corrosion (see 1.2), to facilitate soldering, to provide anti-galling properties, and to be a stopoff coating in the nitriding of high-strength steels.

1.2 Some corrosion can be expected from tin coatings exposed outdoors. In normal indoor exposure, tin is protective on iron, steel, nickel, copper, and their alloys. Corrosion can be expected at discontinuities in the coating (such as pores) due to galvanic couples formed between the tin and the underlying metal through the discontinuities, especially in humid atmospheres. Porosity increases as the coating thickness decreases, so that minimum thicknesses must be specified for each application. Parts coated with tin can be assembled safely in contact with iron and steel, tin-coated aluminum, yellow chromated zinc, cadmium, and solder coatings. (See X5.1 for oxidation and corrosion properties.)

1.3 This specification applies to electroplated coatings of not less than 99 % tin (except where deliberately alloyed for special purposes, as stated in X6.3) obtained from any of the available tin electroplating processes (see 4.3).

1.4 This specification does not apply to hot-dipped tin or other non-electrodeposited coating; it also does not apply to mill products. For mill products, refer to Specifications A623 or A623M.

1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

¹ This specification is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.06 on Soft Metals.

Current edition approved May 1, 2013. Published July 2013. Originally approved in 1971. Last previous edition approved in 2009 as B545 – 97 (2009). DOI: 10.1520/B0545-13.

2. Referenced Documents

2.1 ASTM Standards:²

- A623 Specification for Tin Mill Products, General Requirements
- A623M Specification for Tin Mill Products, General Requirements [Metric]
- B32 Specification for Solder Metal
- B183 Practice for Preparation of Low-Carbon Steel for Electroplating
- B242 Guide for Preparation of High-Carbon Steel for Electroplating
- B246 Specification for Tinned Hard-Drawn and Medium-Hard-Drawn Copper Wire for Electrical Purposes
- B281 Practice for Preparation of Copper and Copper-Base Alloys for Electroplating and Conversion Coatings
- B320 Practice for Preparation of Iron Castings for Electroplating
- B322 Guide for Cleaning Metals Prior to Electroplating
- B374 Terminology Relating to Electroplating
- B487 Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section
- B499 Test Method for Measurement of Coating Thicknesses by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals
- B504 Test Method for Measurement of Thickness of Metallic Coatings by the Coulometric Method
- B507 Practice for Design of Articles to Be Electroplated on Racks
- B542 Terminology Relating to Electrical Contacts and Their Use
- B558 Practice for Preparation of Nickel Alloys for Electroplating
- B567 Test Method for Measurement of Coating Thickness by the Beta Backscatter Method
- B568 Test Method for Measurement of Coating Thickness by X-Ray Spectrometry

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.