



Standard Guide for Determining Mass Per Unit Area of Electrodeposited and Related Coatings by Gravimetric and Other Chemical Analysis Procedures¹

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1. Scope

1.1 This guide outlines a general method for determining the mass per unit area of electrodeposited, electroless, mechanically-deposited, vacuum-deposited, anodized, and chemical conversion coatings by gravimetric and other chemical analysis procedures.

1.2 This guide determines the average mass per unit area over a measured area.

1.3 The stripping methods cited are described in specifications or in the open literature or have been used routinely by at least one laboratory.

1.4 The procedures outlined can be used for many coating-substrate combinations. They cannot be used where the coating cannot be separated from the substrate by chemical or physical means as would be the case if white brass were plated with yellow brass.

1.5 In principle, these procedures can be used to measure very thin coatings or to measure coatings over small areas, but not thin coatings over small areas. The limits depend on the required accuracy. For example, 2.5 mg/cm² of coating might require 2.5 mg of coating covering 1 cm², but 0.1 mg/cm² of coating would require 25 cm² to obtain 2.5 mg of coating.

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

1.7 *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 guide is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.10 on Test Methods.

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2. Referenced Documents

2.1 ASTM Standards:²

A90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
A309 Test Method for Weight and Composition of Coating on Terne Sheet by the Triple-Spot Test (Withdrawn 2015)³
A428/A428M Test Method for Weight [Mass] of Coating on Aluminum-Coated Iron or Steel Articles
B137 Test Method for Measurement of Coating Mass Per Unit Area on Anodically Coated Aluminum
B449 Specification for Chromates on Aluminum

2.2 British Standards Institution Documents:⁴

BS 729 Hot Dip Galvanized Coatings on Iron and Steel Articles, Specification for
BS 1706 Electroplated Coatings of Cadmium and Zinc on Iron and Steel, Specification for
BS 1872 Electroplated Coatings of Tin, Specification for
BS 3189 Phosphate Treatment of Iron and Steel, Specification for
BS 3382 Electroplated Coatings on Threaded Components, Specification for
BS 3597 Electroplated Coatings of 65/35 Tin-Nickel Alloy, Specification for

2.3 Government Standards:

2.3.1 DOD Standard:⁵

DOD-P-16232F Phosphate Coatings, Heavy, Manganese or Zinc Base (for Ferrous Metals)

2.3.2 Federal Standards:⁶

FED-STD 151b Metals; Test Methods: Test 513.1 for Weight of Coating on Hot Dip Tin Plate and Electrolytic Tin Plate

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 The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from British Standards Institute (BSI), 389 Chiswick High Rd., London W4 4AL, U.K.

⁵ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

⁶ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.