



Designation: B659 – 90 (Reapproved 2014)

Standard Guide for Measuring Thickness of Metallic and Inorganic Coatings¹

This standard is issued under the fixed designation B659; 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 covers the methods for measuring the thickness of many metallic and inorganic coatings including electrodeposited, mechanically deposited, vacuum deposited, anodic oxide, and chemical conversion coatings.

1.2 This guide is limited to tests considered in ASTM standards and does not cover certain tests that are employed for special applications.

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

1.4 *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

- B244** Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments
- 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
- B530** Test Method for Measurement of Coating Thicknesses by the Magnetic Method: Electrodeposited Nickel Coat-

- ings on Magnetic and Nonmagnetic Substrates
- 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
- B588** Test Method for Measurement of Thickness of Transparent or Opaque Coatings by Double-Beam Interference Microscope Technique
- B681** Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Transparent Coatings on Opaque Surfaces Using the Light-Section Microscope (Discontinued 2001) (Withdrawn 2001)³
- B767** Guide for Determining Mass Per Unit Area of Electrodeposited and Related Coatings by Gravimetric and Other Chemical Analysis Procedures

2.2 ISO Standards:⁴

- 1463** Metal and Oxide Coatings—Measurement of Thickness by Microscopic Examination of Cross Sections
- 2128** Surface Treatment of Metals—Anodization (Anodic Oxidation) of Aluminum and Its Alloys—Measurement of the Thickness of Oxide Coatings—Nondestructive Measurement by Light Section Microscope
- 2176** Petroleum Products Lubricating Grease Determination of Dropping Point
- 2177** Metallic Coatings—Measurement of Coating Thickness—Coulometric Method by Anodic Solution
- 2178** Non-Magnetic Metallic and Vitreous or Porcelain Enamel Coatings on Magnetic Basis Metals, Measurement of Coating Thickness, Magnetic Method
- 2360** Non-Conductive Coatings on Non-Magnetic Basis Metals—Measurement of Coating Thickness—Eddy Current Method
- 2361** Electrodeposited Nickel Coatings on Magnetic and Non-Magnetic Substrates—Measurement of Coating Thickness—Magnetic Method
- 3497** Metallic Coatings—Measurement of Coating Thickness—X-Ray Spectrometric Methods
- 3543** Metallic and Non-Metallic Coatings—Measurement of Thickness—Beta Backscatter Method

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.

Current edition approved May 1, 2014. Published May 2014. Originally approved in 1979. Last previous edition approved in 2008 as B659-90(2008)^{ε1}. DOI: 10.1520/B0659-90R14.

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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.