



Standard Test Method for Porosity in Gold or Palladium Coatings on Metal Substrates by Gel-Bulk Electrography¹

This standard is issued under the fixed designation B798; 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 test method covers equipment and techniques for determining porosity in noble metal coatings, particularly electrodeposits and clad metals used on electrical contacts.

1.2 The test method is designed to show whether the porosity level is less or greater than some value which by experience is considered by the user to be acceptable for the intended application.

1.3 Other porosity testing methods are outlined in Guide B765. Detailed critical reviews of porosity testing are also available.² Other porosity test methods are B735, B741, B799, and B809.

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

1.5 *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 become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer; to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Sections 7 and 8.

2. Referenced Documents

2.1 ASTM Standards:³

B374 Terminology Relating to Electroplating

B542 Terminology Relating to Electrical Contacts and Their Use

¹ This test method is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.11 on Electrical Contact Test Methods.

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² Nobel, F. J., Ostrow, B. D., and Thompson, D. W., “Porosity Testing of Gold Deposits,” *Plating*, Vol 52, 1965, p. 1001, and Krumbein S. J., “Porosity Testing of Contact Platings,” *Proceedings, Connectors and Interconnection Technology Symposium*, October 1987, p. 47.

³ 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.

B735 Test Method for Porosity in Gold Coatings on Metal Substrates by Nitric Acid Vapor

B741 Test Method for Porosity In Gold Coatings On Metal Substrates By Paper Electrography (Withdrawn 2005)⁴

B765 Guide for Selection of Porosity and Gross Defect Tests for Electrodeposits and Related Metallic Coatings

B799 Test Method for Porosity in Gold and Palladium Coatings by Sulfurous Acid/Sulfur-Dioxide Vapor

B809 Test Method for Porosity in Metallic Coatings by Humid Sulfur Vapor (“Flowers-of-Sulfur”)

3. Terminology

3.1 *Definitions*—Many terms used in this test method are defined in Terminology B542 and terms relating to metallic coatings are defined in Terminology B374.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *decorations, n*—those reaction products emanating from the pores that provide visual contrast with the gel medium.

3.2.2 *measurement area (or “significant surface”), n*—the surface that is examined for the presence of porosity. The significant surfaces or measurement areas of the part to be tested shall be indicated on the drawing of the part or by provision of suitably marked samples.

3.2.2.1 *Discussion*—For specification purposes, the significant surfaces or measurement areas are often defined as those portions of the surface that are essential to the serviceability or function of the part, such as its contact properties, or which can be the source of corrosion products or tarnish films that interfere with the function of the part.

3.2.3 *metallic coatings, n*—include platings, claddings, or other metallic layers applied to the substrate. The coatings can comprise a single metallic layer or a combination of metallic layers.

3.2.4 *porosity, n*—the presence of any discontinuity, crack, or hole in the coating that exposes a different underlying metal.

3.2.5 *underplate, n*—a metallic coating layer between the substrate and the topmost layer or layers. The thickness of an underplate is usually greater than 0.8 μm (30 $\mu\text{in.}$).

⁴ The last approved version of this historical standard is referenced on www.astm.org.