



Standard Test Method for Porosity in Metallic Coatings by Humid Sulfur Vapor ("Flowers-of-Sulfur")¹

This standard is issued under the fixed designation B809; 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 standard covers equipment and test methods for determining the porosity of metallic coatings, where the pores penetrate down to a silver, copper, or copper-alloy substrate.

1.2 This test method is suitable for coatings consisting of single or combined layers of any coating that does not significantly tarnish in a reduced sulfur atmosphere, such as gold, nickel, tin, tin-lead, and palladium, or their alloys.

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

1.4 Recent reviews of porosity testing and testing methods can be found in the literature.^{2,3} Guide B765 is suitable to assist in the selection of porosity tests for electrodeposits and related metallic coatings. Other porosity test standards are Test Methods B735, B741, B798, and B799.

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.* For specific hazards statements, see Section 8.

¹ This test method 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 Clarke, M., "Porosity and Porosity Tests," *Properties of Electrodeposits*, Sard, Leidheiser, and Ogburn, eds., The Electrochemical Society, 1975, p. 122.

³ Krumbein, S. J., "Porosity Testing of Contact Platings," *Transactions of the Connectors and Interconnection Technology Symposium*, Philadelphia, PA, October 1987, p. 47.

2. Referenced Documents

2.1 ASTM Standards:⁴

B374 Terminology Relating to Electroplating

B542 Terminology Relating to Electrical Contacts and Their Use

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)⁵

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

B798 Test Method for Porosity in Gold or Palladium Coatings on Metal Substrates by Gel-Bulk Electrography

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

3. Terminology

3.1 *Definitions*—Many terms used in this test method are defined in Terminologies B374 and B542.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *corrosion products*—reaction products of the basis metal or underplate, that protrude from, or are otherwise attached to, the coating surface after the test exposure.

3.2.2 *measurement area*—in this test method, that portion or portions of the surface that is examined for the presence of porosity. The measurement area shall be indicated on the drawings of the parts, or by the provision of suitably marked samples.

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

⁴ 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.

⁵ The last approved version of this historical standard is referenced on www.astm.org.