



Designation: D5162 – 24

Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates¹

This standard is issued under the fixed designation D5162; 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 practice covers procedures for determining discontinuities using two types of detectors:

- 1.1.1 *Method A*—Low Voltage Wet Sponge, and
- 1.1.2 *Method B*—High Voltage Spark Testers.

1.2 This practice addresses metallic substrates. For concrete surfaces, refer to Practice **D4787**.

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- D4787 Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates**
- D7091 Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals**

¹ This practice is under the jurisdiction of ASTM Committee **D01** on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee **D01.46** on Industrial Protective Coatings.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *discontinuity, as used in this standard, n*—a flaw, void, crack, thin spot, foreign inclusion, or contamination in the coating film that significantly lowers the dielectric strength of the coating film; a discontinuity may also be identified as a holiday or pinhole.

3.1.2 *holiday, as used in this standard, n*—a term that identifies a discontinuity.

3.1.3 *holiday detector, as used in this standard, n*—a device that locates discontinuities in a nonconductive coating film applied to an electrically conductive surface.

3.1.4 *pinhole, as used in this standard, n*—a film defect characterized by small pore like flaws in the coating which, when extended entirely through the film, will appear as a discontinuity; a pinhole in the finish coat may not appear as a discontinuity.

4. Significance and Use

4.1 A coating/lining is applied to a metallic substrate to prevent corrosion or reduce product contamination, or both. The degree of coating continuity required is dictated by service conditions. Discontinuities in a coating/lining are frequently very minute and may not be readily visible. This practice provides a procedure for electrical detection of discontinuities in nonconductive coating systems.

4.2 Electrical testing to determine the presence and number of discontinuities in a coating/lining is performed on a nonconductive coating/lining applied to an electrically conductive surface. The allowable number of discontinuities should be determined prior to conducting this test since the acceptable quantity of discontinuities will vary depending on film thickness, design, and service conditions.

4.3 Low voltage wet sponge test equipment is generally used for detecting discontinuities in coatings/linings having a total thickness of 0.5 mm (20 mil) or less. High voltage spark test equipment is generally used for detecting discontinuities in coatings/linings having a total thickness of greater than 0.5 mm (20 mil).

4.3.1 Coatings/linings less than 0.5 mm (20 mil) in thickness may be susceptible to damage if tested with high voltage