



Standard Practice for the Nondestructive Testing of Geomembrane Seams using the Spark Test¹

This standard is issued under the fixed designation D6365; 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 the nondestructive testing of field seams in geomembranes using the spark test. A suspect area is indicated by the generation of a spark. The test is applicable to seams made by the extrusion method, seams made by using welding tape (a strip of the same type of material as the geomembrane, that is welded over adjacent sections of geomembrane to create a seam), or seams where it is practical to insert a conductive material in the seam just prior to or during fabrication.

1.2 The spark test may produce an electrical spark and therefore can only be used where an electrical spark would not create a hazard.

1.3 Unless the voltages and distances prescribed are carefully adhered to, a “false positive” indication may result. This false positive occurs when the arc distance is too large for the voltage applied at the time and conditions of testing.

1.4 The values stated in SI units are to be regarded as standard. The values given 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 establish appropriate health and safety practices and to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D4439 Terminology for Geosynthetics

D4491 Test Methods for Water Permeability of Geotextiles by Permittivity

¹ This practice is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.10 on Geomembranes. Current edition approved June 1, 2011. Published July 2011. Originally approved in 1999. Last previous edition approved in 2006 as D6365 – 99(2006). DOI: 10.1520/D6365-99R11.

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. Terminology

3.1 Definitions:

3.1.1 *geomembrane, n*—an essentially impermeable geosynthetic composed of one or more synthetic sheets.

3.1.1.1 *Discussion*—In geotechnical engineering, essentially impermeable means that no measurable liquid flows through a geosynthetic when tested in accordance with Test Methods D4491.

3.1.2 *seam, n*—a permanent joining of two or more materials.

3.2 For definition of other terms, see Terminology D4439.

4. Summary of Practice

4.1 To use this practice a conductive material is inserted into the field seam just prior to or during fabrication. The conductive material in the seam is connected to the negative terminal of the test apparatus, and a positive voltage is applied across the seam edge. A suspect area in the seam is indicated by a spark from the voltage source to the conductive material.

5. Significance and Use

5.1 Spark testing of geomembrane field seams is particularly useful in locations where other nondestructive test methods are not practical, for example in tight corners or a circumferential seam around a pipe.

6. Apparatus

6.1 The test apparatus consists of a high-voltage, low-current source with a negative terminal for ground and a positive terminal for a voltage applicator. A voltage applicator may consist of a handle and wire brush, conductive neoprene squeegee, or other suitable applicator.

6.2 The range of the high voltage source is typically 20 000 to 35 000 V.

6.2.1 The voltage required to cause a discharge (spark) between the positive electrode and the negative electrode wire is expressed by the formula.

$$V = K\sqrt{D} \quad (1)$$

where:

V = test voltage,