



Standard Test Method for Determining Integrity of Seams Produced Using Thermo- Fusion Methods for Reinforced Geomembranes by the Grab Method¹

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1. Scope

1.1 This test method describes destructive quality control tests used to determine the integrity of thermo-fusion seams made with reinforced geomembranes. A test procedure is described that uses seam tests using grab specimens for seam shear strength.

1.2 The types of thermal field and factory seaming techniques used to construct geomembrane seams include the following.

1.2.1 *Hot Air*—This technique introduces high-temperature air between two geomembrane surfaces to facilitate melting. Pressure is applied to the top or bottom geomembrane, forcing together the two surfaces to form a continuous bond.

1.2.2 *Hot Wedge*—This technique melts the two geomembrane surfaces to be seamed by running a hot metal wedge between them. Pressure is applied to the top and bottom geomembrane to form a continuous bond. Some seams of this kind are made with dual tracks separated by a non-bonded gap. These seams are sometimes referred to as dual hot wedge seams or double-track seams.

1.2.3 *Extrusion*—This technique encompasses extruding molten resin between two geomembranes or at the edge of two overlapped geomembranes to effect a continuous bond.

1.2.4 *Radio Frequency (RF) or Dielectric*—High frequency dielectric equipment is used to generate heat and pressure to form an overlap seam in factory fabrication.

1.2.5 *Impulse*—Clamping bars heated by wires or a ribbon melts the sheets clamped between them. A cooling period while still clamped allows the polymer to solidify before being released.

1.3 The types of materials covered by this test method include, but are not limited to, reinforced geomembranes made from the following polymers.

1.3.1 *Very Low Density Polyethylene (VLDPE)*.

1.3.2 *Linear Low Density Polyethylene (LLDPE)*.

1.3.3 *Flexible Polypropylene (fPP)*.

1.3.4 *Polyvinyl Chloride (PVC)*.

1.3.5 *Chlorosulfonated polyethylene (CSPE)*.

1.3.6 *Ethylene Interpolymer Alloy (EIA)*.

1.4 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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

2. Referenced Documents

2.1 *ASTM Standards*:²

[D4439 Terminology for Geosynthetics](#)

[D7004 Test Method for Grab Tensile Properties of Reinforced Geomembranes](#)

[D7003 Test Method for Strip Tensile Properties of Reinforced Geomembranes](#)

[D76 Specification for Tensile Testing Machines for Textiles](#)

3. Terminology

3.1 Definitions—Refer to Terminology for Geosynthetics, [D4439](#) for definitions of terms applying to this test method.

4. Significance and Use

4.1 The use of reinforced geomembranes as barrier materials has created a need for a standard test method to evaluate the quality of seams produced by thermo-fusion methods. This test method is used for quality control purposes and is intended to provide quality control and quality assurance personnel with data to evaluate seam quality.

¹ This test method is under the jurisdiction of ASTM Committee [D35](#) on Geosynthetics and is the direct responsibility of Subcommittee [D35.10](#) on Geomembranes.

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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.