



Designation: D7747/D7747M – 11 (Reapproved 2023)

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

This standard is issued under the fixed designation D7747/D7747M; 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 describes destructive quality control tests used to determine the integrity of thermo-fusion seams made with reinforced geomembranes. Test procedures are described for seam tests for peel and shear properties using strip specimens.

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

1.6 *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

D76/D76M Specification for Tensile Testing Machines for Textiles

D4439 Terminology for Geosynthetics

D7003/D7003M Test Method for Strip Tensile Properties of Reinforced Geomembranes

D7004/D7004M Test Method for Grab Tensile Properties of Reinforced Geomembranes

D7749/D7749M Test Method for Determining Integrity of Seams Produced Using Thermo-Fusion Methods for Reinforced Geomembranes by the Grab Method

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.