



Designation: D7177 – 05

Standard Specification for Air Channel Evaluation of Polyvinyl Chloride (PVC) Dual Track Seamed Geomembranes¹

This standard is issued under the fixed designation D7177; 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 specification covers a nondestructive evaluation of the strength and continuity of parallel PVC geomembrane seams separated by an unwelded air channel. The unwelded air channel between the two distinct seamed regions is sealed and inflated with air to a predetermined pressure. Long lengths of seam can be evaluated by this specification more quickly than by other common nondestructive tests.

1.2 This specification can be used as a substitute for destructive testing or used in conjunction with destructive testing.

1.3 This specification covers PVC sheet 0.760 mm (0.030 in.) and thicker.

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 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

3. Terminology

3.1 *Definitions:*

3.1.1 *dual seam, n*—a geomembrane seam with two parallel welded zones separated by an unwelded air space.

3.1.1.1 *Discussion*—The dual seam itself can be made by a number of methods; hot wedge, hot air, and ultrasonic bonding are all typical techniques.

¹ This specification 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.

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

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

3.2 For definitions of other terms, see Terminology D4439.

4. Summary of Specification

4.1 This specification utilizes a dual seam where an air channel exists between the two welded zones. Both ends of the air channel are sealed and then a pressure gauge is attached to the air space. Air pressure is applied and the gauge is monitored.

4.2 Air pressures used in this specification are related to the ambient temperature of the PVC geomembrane and can be used for thickness 0.760 mm (0.030 in.) and thicker PVC geomembrane. The air pressure is not dependant on thickness of the PVC geomembrane being tested.

4.3 The minimum monitoring time is recommended to be ½ min (30 s) following stabilization of the pressure.

5. Significance and Use

5.1 The increased use of geomembranes as barrier materials to restrict liquid or gas movement, and the common use of dual track seams in joining these sheets, has created a need for a standard nondestructive test by which the quality of the seams can be assessed for continuity, water tightness, and strength. The test is also intended to provide an indication of the physical peel strength of the PVC seam.

5.2 This specification recommends an air pressure test within the channel created between dual seamed tracks whereby the presence of un-bonded sections or channels, voids, discontinuities, foreign objects, and the like, in the seamed region can be identified.

5.3 This technique is intended for use on seams of PVC Geomembrane sheets 0.760 mm (0.030 in.) and thicker formulated from the appropriate polymers and compounding ingredients to form a polyvinyl chloride sheet material that meets all specified requirements for the end use of the product.

5.4 This test is used to assure minimum peel strengths are met through the entire seam area.