



Designation: D4437 – 08(Reapproved 2013)

# Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes<sup>1</sup>

This standard is issued under the fixed designation D4437; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice is intended for use as a summary of nondestructive quality control test methods for determining the integrity of seams used in the joining of flexible sheet materials in a geotechnical application. This practice outlines the test procedures available for determining the quality of bonded seams. Any one or combination of the test methods outlined in this practice can be incorporated into a project specification for quality control. These test methods are applicable to manufactured flexible polymeric membrane linings that are scrim reinforced or nonreinforced. This practice is not applicable to destructive testing. For destructive test methods look at other ASTM Standards and Practices.

1.2 The types of seams covered by this practice include the following: Thermally Bonded Seams, Hot Air, Hot Wedge (or Knife), Extrusion, Solvent Bonded Seams, Bodied Solvent Bonded Seams, Adhesive Bonded or Cemented Seams, Taped Seams, Waterproofed Sewn Seams.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard may involve hazardous materials, operations, and equipment. 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:<sup>2</sup>

<sup>1</sup> 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 May 1, 2013. Published June 2013. Originally approved in 1984. Last previous edition approved in 2008 as D4437-08. DOI: 10.1520/D4437-08R13.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D5641 Practice for Geomembrane Seam Evaluation by Vacuum Chamber](#)

[D5820 Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes](#)

[D6365 Practice for the Nondestructive Testing of Geomembrane Seams using the Spark Test](#)

[D7006 Practice for Ultrasonic Testing of Geomembranes](#)

[D7177 Specification for Air Channel Evaluation of Polyvinyl Chloride \(PVC\) Dual Track Seamed Geomembranes](#)

## 3. Significance and Use

3.1 The use of geomembranes as barrier materials to restrict liquid migration from one location to another in soil and rock, and the large number of seam methods and types used in joining these geomembrane sheets, has created a need for standard tests by which the various seams can be compared and the quality of the seam systems can be non-destructively evaluated. This practice is intended to meet such a need.

3.2 The geomembrane sheet material shall be formulated from the appropriate polymers and compounding ingredients to form a plastic or elastomer sheet material that meets all specified requirements for the end use of the product. The sheet material (reinforced or nonreinforced) shall be capable of being bonded to itself by one of the methods described in 1.2 in accordance with the sheet manufacturer's recommendations and instructions.

## 4. Nondestructive Test Methods

4.1 For all test methods listed below, any and all flaws in seam construction that are detected under a given test procedure shall be repaired. All nondestructive test methods listed are not necessarily applicable to all polymeric geomembrane materials.

4.2 *Air Lance Test*—Inspect all seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, ripples indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a  $\frac{3}{16}$  in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge.