



Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes¹

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1. Scope

1.1 This practice is intended for use as a summary of destructive and nondestructive quality control test methods for determining the integrity of field 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.

1.2 The types of field seams covered by this practice include the following:

1.2.1 *Thermally Bonded Seams:*

1.2.1.1 *Hot Air*—A seam produced by applying high-temperature air or gas between two polymeric sheet surfaces, thus melting the surfaces, at which time pressure is applied to form a homogeneous bond between the two membrane surfaces.

1.2.1.2 *Hot Wedge (or Knife)*—A seam produced by melting the two intimate surfaces by running a hot metal wedge between the surfaces followed immediately by pressure to form a homogeneous bond.

1.2.1.3 *Extrusion*—A bonded seam produced by extruding molten parent material between or at the edge of two overlapped polymer sheet materials to effect a homogeneous melt between the two sheets to be joined.

1.2.2 *Solvent Bonded Seams*—A solvent is used to soften the surfaces to be bonded, followed by pressure to form a homogeneous bond.

1.2.3 *Bodied Solvent Bonded Seams*—The parent lining polymer material is dissolved in a solvent that is then applied in the same manner as a straight solvent, thus effecting a homogeneous bond.

1.2.4 *Adhesive Bonded or Cemented Seams*—An adhesive system is used to bond two polymeric surfaces together. This system forms an adhesive bond between the sheet materials.

1.2.5 *Taped Seams*—An adhesive-based tape is placed between two polymer sheet materials forming a surface bond.

1.2.6 *Waterproofed Sewn Seams*—Seam fabricated by mechanical sewing of the overlapped sheet materials and sealed with an appropriate sealant as recommended by the sheet manufacturer.

1.3 The values stated in inch-pound units are to be regarded as the 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:*

D 413 Test Methods for Rubber Property—Adhesion to Flexible Substrate²

D 618 Practice for Conditioning Plastics for Testing³

D 816 Methods of Testing Rubber Cements²

3. Significance and Use

3.1 The increased 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 evaluated. This practice is intended to meet such a need.

4. Materials and Manufacture

4.1 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.

¹ This practice 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 *Annual Book of ASTM Standards*, Vol 09.01.

³ *Annual Book of ASTM Standards*, Vol 08.01.