



Standard Practice for Time-to-Failure (Creep-Rupture) of Adhesive Joints Fabricated from EPDM Roof Membrane Material¹

This standard is issued under the fixed designation D 6383; 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 (€) indicates an editorial change since the last revision or reapproval.

€¹ NOTE—Table 1 and paragraph 9.1.2 were editorially corrected in June 2000.

1. Scope

1.1 This practice covers sample preparation temperatures, test parameters, and specimen exposure conditions that are applicable when Test Method D 5405 is used for conducting time-to-failure (creep-rupture) tests of adhesive joints fabricated from ethylene-propylene-diene terpolymer (EPDM) roof membrane material.

1.2 This practice is applicable to joints fabricated in the laboratory from EPDM roof membrane materials and adhesives received from suppliers, and to joints prepared from EPDM seams sampled from field installations.

1.3 The joints are bonded using preformed tape or liquid-based adhesives, and EPDM roof membrane materials that are non-reinforced, fabric- or scrim-reinforced, and fabric backed. Primers are also used as recommended for the specific adhesive.

1.4 This practice contains notes that are explanatory and are not part of the mandatory requirements of this practice.

1.5 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

1.6 *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 the regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 907 Terminology of Adhesives²

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials³

D 5405 Test Method for Conducting Time-to-Failure (Creep-Rupture) Tests of Joints Fabricated from Nonbituminous Organic Roof Membrane Material³

2.2 SPRI Document:

SPRI Recommended Laboratory Test Methods for Liquid and Tape Adhesives Used to Splice Single-Ply Membranes⁴

3. Terminology

3.1 *Definitions*— For definitions of terms used in this practice, refer to Terminologies D 907 and D 1079.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *creep-rupture test*—a test that measures the time-to-failure of a specimen subjected to a constant load; progressive specimen deformation may also be measured.

3.2.2 *failure*—rupture of the bond resulting in complete separation of its adherends under the test conditions; or, alternatively, rupture of the membrane material away from the bonded section of the test specimen (that is, material rupture).

3.2.3 *time-to-failure*—the period of time beginning when a joint specimen is placed under load and ending when failure occurs.

4. Summary of Practice

4.1 Adhesive joints are prepared in the laboratory at ambient and low temperatures using tape or liquid adhesives and EPDM roof membrane material. Creep-rupture tests are then conducted in accordance with Test Method D 5405 before and after subjecting these joints to artificial exposure in the laboratory. The loads are applied in either peel or shear configurations at ambient and elevated temperatures. Table 1 summarizes the preparation temperatures, test parameters, and exposure conditions incorporated in this practice. Alternatively, adhesive joints are prepared from EPDM seams sampled from roofs in service, and then subjected directly to creep-rupture testing.

5. Significance and Use

5.1 An important factor affecting the performance of seams of EPDM membranes is their ability to remain bonded over the membrane's expected service life. Time-to-failure tests provide a means of characterizing the behavior of joints under constant load over time.

NOTE 1—Table 1 is based on the results of an industry government

¹ This practice is under the jurisdiction of ASTM Committee D-8 on Roofing, Waterproofing, and Bituminous Materials and is the direct responsibility of Subcommittee D08.18 on Nonbituminous Organic Roof Coverings.

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² *Annual Book of ASTM Standards*, Vol 15.06.

³ *Annual Book of ASTM Standards*, Vol 04.04.

⁴ Available from SPRI, 175 Highland Ave., Needham, MA 01294.