



Standard Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials¹

This standard is issued under the fixed designation D 5636; 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.

^{e1} NOTE—Editorially switched from English dominant to SI dominant.

1. Scope

1.1 This test method covers the procedure for the physical testing and analysis of surface cracking due to low temperature unrolling of roofing composed of bituminous impregnated felts and reinforced polymer modified bituminous sheet materials. These products may employ various surfacing materials on one side.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials²

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology D 1079.

4. Summary of Test Method

4.1 The felt or sheet roofing or waterproofing material roll is temperature conditioned. Specimens are then taken from the roll, wrapped around a mandrel, temperature conditioned, unrolled, and inspected for cracking.

5. Significance and Use

5.1 Since felts or sheet roofing or waterproofing materials are brought to the roof in a roll and unrolled, this test method simulates felt or membrane behavior under actual field conditions during the unrolling process.

5.2 This test method is designed to aid those interested in

the physical properties of roofing and waterproofing felts and sheet materials.

5.3 This test method enables a researcher to measure the relative behavior of low temperature unrolling of roofing and waterproofing felt or sheet materials under laboratory conditions.

5.4 The data obtained from this test method will not permit service life prediction or the ability of the material to be installed at the tested temperature. Unrolling capabilities are important during application, and the temperature at the time of unrolling is believed to affect the performance of roofing and waterproofing membranes. However, the actual link between the test data and performance is unknown and is dependent on the materials and exposure.

6. Apparatus

6.1 The mandrel for the test procedure is a ± 80 mm (3.125 in.) outer diameter (Schedule 30) PVC pipe, a minimum ± 250 mm (10.0 in.) in length.

7. Test Method

7.1 *Unrolling at Low Temperatures*—This test method determines the temperature at which no cracking is observed in the felt or sheet roofing or waterproofing materials after unrolling at the test temperature from a ± 80 mm (3.125 in.) diameter mandrel.

7.2 Sampling:

7.2.1 The specimens are to be taken from a roll of roofing or waterproofing materials conditioned at $23 \pm 3^\circ\text{C}$ ($73.6 \pm 3.4^\circ\text{F}$) and $50 \pm 5\%$ relative humidity for 24 h. No specimens are to be taken closer than ± 1.22 m (4 ft.) from the leading edge or closer than ± 150 mm (6 in.) from the side of the roll.

7.2.2 Cut four specimens from the roll in the longitudinal direction. The specimens shall be ± 250 mm (± 3 mm) [10 in. ($\pm 1/8$ in.)] wide by ± 450 mm (± 3 mm) [18 in. ($\pm 1/8$ in.)] long.

8. Procedure

8.1 Secure the specimen to the mandrel, weather side against mandrel, with polyethylene tape. Wrap the temperature conditioned specimen evenly and firmly around the mandrel. Secure the specimen to the mandrel, wrapping sufficiently with

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² *Annual Book of ASTM Standards*, Vol 04.04.

clear plastic wrap, and maintain the specimen on the mandrel at $23 \pm 3^{\circ}\text{C}$ ($73 \pm 3.4^{\circ}\text{F}$) and $50 \pm 5\%$ relative humidity for 24 h.

8.2 Place the specimen assembly in a refrigeration unit at a temperature where the felt or sheet is presumed to be capable of passing. If this information is not available, make a preliminary screening test at $0 \pm 1^{\circ}\text{C}$ ($32 \pm 2^{\circ}\text{F}$). Maintain the temperature in the refrigeration unit at desired temperature 0.5°C ($\pm 1^{\circ}\text{F}$) for a minimum of 2 h. Change the temperature intervals in preceding tests at $\pm 2^{\circ}\text{C}$ ($\pm 4^{\circ}\text{F}$). Allow the refrigerated unit and mandrel to equilibrate before proceeding with subsequent testing.

8.3 Remove the specimen assembly from the refrigeration unit. Remove the plastic wrap. Carefully and evenly clamp the exposed end of the specimen to a clip board. Unroll the specimen onto a horizontal surface, keeping the material flat against the surface. Time allowance for removal from refrigerated unit to unrolling is 30 s, and time allowance of unrolling is between 4 and 6 s. Inspect for signs of cracking. Record the location and length of any cracks. Consider any visible surface ruptures as a failure.

8.4 Repeat the procedure until the lowest temperature at which none of the specimens show cracking is achieved. Allow the refrigeration unit to equilibrate before testing subsequent specimens at different temperatures.

9. Report

9.1 Report complete specimen identification and the lowest temperature where cracking is not evident to the unaided eye. Tested specimens may not be reused for successive testing at lower or higher temperatures. For the purposes of this test method, any surface crack is considered a failure at the tested temperature where the crack appears.

10. Precision and Bias

10.1 No statement is made about either the precision or bias of Test Method D 5636 for measuring low temperature unrolling since the result merely states whether there is conformance to the criteria for success specified in the procedure.

11. Keywords

11.1 cracking; felt; low temperature; sheet roofing; unrolling; waterproofing

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