



Designation: C488 – 16 (Reapproved 2023)

Standard Test Method for Conducting Exterior Exposure Tests of Finishes for Thermal Insulation¹

This standard is issued under the fixed designation C488; 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 test method covers out-of-doors exposure testing of finishes that are normally field-applied to thermal insulation and possibly include joints or joint sealants, or both. Such exposure is essential prior to the determination of certain physical properties when the finish is to be exposed to exterior weather conditions. This test method also indicates possible compatibility problems between the joint sealant and the finish as well as the ability of the finish to span a dry joint. This test method is not intended to evaluate mildew resistance, efflorescence, or chemical resistance.

NOTE 1—For testing free plastic films, see Practice D1435.

1.2 This test method does not prescribe the method of application, test duration, or inspection intervals.

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 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.33 on Insulation Finishes and Moisture.

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2. Referenced Documents

2.1 *ASTM Standards*:²

C168 Terminology Relating to Thermal Insulation
D1435 Practice for Outdoor Weathering of Plastics

3. Terminology

3.1 *Definitions*: Terminology C168 applies to the terms used in this test method.

4. Summary of Test Method

4.1 This test method specifies out-of-doors exposure, under ambient conditions, of field-applied finishes on thermal insulations, utilizing a minimum of three test specimens and one control specimen stored indoors.

5. Significance and Use

5.1 Both physical and chemical changes possibly occur from weather exposure, and these changes affect performance properties, service life, and maintenance schedules. For this reason, tests of properties relating to performance shall be made both before and after specific periods of outdoor exposure.

5.2 This test method recognizes that differing geographical locations, environmental conditions, differences between surface temperatures and ambient temperatures, and test durations have extremely varied effects upon the test results.

5.3 This test method is to be used for comparative qualitative testing.

6. Test Specimens

6.1 A minimum of three test specimens and one control specimen, each having been applied to an insulation base of minimum dimensions 1 in. by 6 in. by 12 in. (25 mm by 150 mm by 300 mm), shall be prepared. Insulation shall be the same as that which is proposed for the application. The control specimen shall be stored indoors.

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.

6.1.1 If the insulation thickness in actual application is less than 1 in. (25 mm), then the thickness of the insulation base shall be as in practice.

6.2 The following types of specimens are possible for testing:

- 6.2.1 Thermal insulation with no joints,
- 6.2.2 Thermal insulation with dry joints, and
- 6.2.3 Thermal insulation with joints filled with joint sealant.

6.3 For testing compatibility of sealants with finishes, joints at least 1 in. (25 mm) deep by $\frac{1}{16}$ in. to $\frac{3}{16}$ in. (2 mm to 5 mm) wide by 12 in. (300 mm) long shall be cut in the insulation block. Joints shall be at least 4 in. (100 mm) apart and at least 4 in. (100 mm) from the edges, parallel to the joint. More than one sealant is potentially tested with a single finish by varying the sealant in each successive joint. These individual insulation pieces shall be adhered with a suitable adhesive to a larger slab of the same insulation of dimensions of the desired completed specimen size in order to form a stable base for the specimen.

6.3.1 For test specimens resulting in less than 1 in. (25 mm) thickness, the joint shall be practiced on the fully cut specimen.

6.4 The joints filled with the joint sealant are to have the finish applied immediately or allowed to cure or set for a week. The compatibility results will possibly vary significantly depending upon how long the joint sealant is exposed to the atmosphere before the finish coat is applied.

6.5 The finish to be evaluated shall be applied to the specified test face and edges of the insulation base material. The application procedure for single and multiple coats shall be made a part of the test records.

6.6 The thickness of the finish shall be made a part of the test record.

6.7 The specimen shall be prepared, flashed or sealed, and mounted so that liquid water cannot enter the specimen.

6.8 The use of any reinforcing membrane shall be made a part of the test record.

7. Procedure

7.1 The exposure or mounting position of the out-of-doors test specimens shall be 45° from the horizontal, facing upward and due south. The 6-in. (150 mm) dimension shall be horizontal, east to west.

7.2 Record the geographical latitude, longitude, and altitude of the test location.

7.3 Mount the test specimens so that they are neither in a shadow nor cast shadows on each other, and in such a manner that any products of weathering and rain water drippings shall not flow from one test specimen to another. Fasten specimens by the back surface in such a manner as to prevent displacement by the wind.

7.4 The test period shall be either as specified or sufficient to evaluate the characteristics of the finishes under evaluation.

7.5 Make inspections at regular intervals, observing:

- 7.5.1 Discoloration,
- 7.5.2 Cracking,
- 7.5.3 Crazeing,
- 7.5.4 Flaking,
- 7.5.5 Chalking,
- 7.5.6 Shrinkage,
- 7.5.7 Blistering,
- 7.5.8 Holes,
- 7.5.9 Loss of adhesion, and
- 7.5.10 Incompatibility between sealant and finish.

8. Report

8.1 Report the following information:

- 8.1.1 Type of insulation,
- 8.1.2 Size of sample,
- 8.1.3 Presence of joints,
- 8.1.4 Type and identification of joint sealants,
- 8.1.5 Length of cure time of joint sealants prior to application of finish,
- 8.1.6 Type of finish and color,
- 8.1.7 Application procedure for single and multiple coats,
- 8.1.8 Use of any reinforcing membrane,
- 8.1.9 Thickness of finish,
- 8.1.10 Geographical location (latitude, longitude, and altitude),
- 8.1.11 Test duration and dates of exposure and removal, and
- 8.1.12 Inspection intervals.

8.2 Report the following observations:

- 8.2.1 Discoloration,
- 8.2.2 Cracking,
- 8.2.3 Crazeing,
- 8.2.4 Flaking,
- 8.2.5 Chalking,
- 8.2.6 Shrinkage,
- 8.2.7 Blistering,
- 8.2.8 Holes,
- 8.2.9 Loss of adhesion, and
- 8.2.10 Incompatibility between sealant and finish.

9. Precision and Bias

9.1 No statement is made about either the precision or bias of this test method since the result merely reports the visual presence of discoloration, cracking, crazeing, flaking, chalking, shrinkage, blistering, holes, loss of adhesion, and incompatibility between sealant and finish.

10. Keywords

10.1 coatings; exterior exposure test; test procedure; vapor barrier finishes