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Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage¹

This standard is issued under the fixed designation ~~E2570~~E2570/E2570M; 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.

^{ε1} NOTE—Units information was editorially corrected and editorial changes were made throughout in September 2014.

1. Scope

1.1 These test methods apply to trowel, roller, or spray applied Water-resistive barrier (WRB) coatings that are applied over exterior sheathing prior to application of EIFS or EIFS with drainage wall claddings.

1.2 Test methods for in place wall system and cladding related to tests such as fire resistance, wind load capability, air barrier performance, and so forth. should also be considered but are outside the scope of this document.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as the standard. ~~The values given in parentheses are for information only.~~ stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[C297/C297M Test Method for Flatwise Tensile Strength of Sandwich Constructions](#)

[D2247 Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity](#)

[D2898 Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing](#)

[E72 Test Methods of Conducting Strength Tests of Panels for Building Construction](#)

[E96/E96M Test Methods for Water Vapor Transmission of Materials](#)

[E330/E330M Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference](#)

[E331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference](#)

[E631 Terminology of Building Constructions](#)

[E1233/E1233M Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential](#)

[E2110 Terminology for Exterior Insulation and Finish Systems \(EIFS\)](#)

[E2134/E2134M Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System \(EIFS\)](#)

[E2485/E2485M Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems \(EIFS\) and Water Resistive Barrier Coatings](#)

¹ This test method is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.58 on Exterior Insulation and Finish Systems (EIFS).

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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.

2.2 AATCC Standards:³

AATCC 127 Water Resistance: Hydrostatic Pressure Test

3. Terminology

3.1 Definitions related to EIFS may be found in Terminology E2110 and general terms in Terminology E631.

4. Significance and Use

4.1 This series of test methods provides a means to evaluate performance of the water-resistive barrier coating when subjected to various physical and environmental conditions. The water-resistive barrier coating is applied between the EIFS and substrate in an EIFS-clad wall assembly and is intended to provide additional protection to the building and its contents from incidental moisture intrusion that may occur through the building envelope. Although protected from direct weather exposure after the EIFS is installed, the coating must be durable and weather resistant as it is subjected to various environmental conditions prior to application of the EIFS as well as while the system is in service.

5. Test Specimens

5.1 Tensile ~~Bond~~Bond:

5.1.1 Prepare five samples for each sheathing substrate, a minimum of 152 mm × 152 mm (~~6~~~~6 in. × 6 in.~~~~in.~~), that consists of two sheathing sections assembled with a 3.2 mm (~~1~~~~8 in.~~~~in.~~) wide joint. Apply the joint treatment, if applicable, and water-resistive barrier coating in accordance with the manufacturer's recommended instructions.

5.1.2 Test where the water resistive barrier is a system composed of multiple products that overlap, the bond between water resistive barrier products.

5.1.3 Prepare five specimens for each flashing material for which recognition is sought, a minimum of 51 mm × 51 mm (~~2~~~~2 in. × 2 in.~~~~in.~~) by applying the water-resistive barrier coating, and the flashing treatment, to the flashing material.

5.2 Freeze ~~Thaw~~Thaw:

5.2.1 Construct five samples for each sheathing substrate, a minimum of 152 mm × 152 mm (~~6~~~~6 in. × 6 in.~~~~in.~~) that consists of two sheathing sections assembled with a 3.2 mm (~~1~~~~8 in.~~~~in.~~) wide joint. Apply the joint treatment, if applicable, and the water-resistive barrier coating in accordance with the manufacturer's recommended instructions. The back and sides of the specimens shall be sealed with an impervious material that need not be the coating. Specimens shall be representative of those used in actual construction.

5.3 Water ~~Resistance~~Resistance:

5.3.1 Prepare three samples, a minimum of 102 mm × 152 mm (~~4~~~~4 in. × 6 in.~~~~in.~~), and containing a 6.4 mm (~~1~~~~4 in.~~~~in.~~) wide joint for each substrate by applying the joint treatment, if applicable, and the water-resistive barrier coating to the substrate according to the manufacturer's recommended application instructions. The back and sides of the samples shall be sealed with material impervious to water that need not be the water resistive barrier coating. Specimens shall be representative of those used in actual construction.

5.4 Water Vapor ~~Transmission~~Transmission:

5.4.1 Prepare three samples, a minimum of 70 mm (~~2~~~~3~~~~4 in.~~~~in.~~) diameter of the water-resistive barrier coating by applying the water-resistive barrier coating, at the recommended thickness, to a non-adhesive surface. After curing for the time recommended by the manufacturer, the coating is removed from the non-adhesive surface and the average thickness is determined from the material density, area, and weight or by using a micrometer or calipers to the nearest 0.025 mm (~~0~~~~.001 in.~~~~in.~~).

5.5 Durability (~~Transverse Load, Racking, Environmental Conditioning, and Water Penetration~~)Penetration):

5.5.1 Construct one sample, a minimum of 2438 mm × 2438 mm (~~8~~~~8 ft × 8 ft~~~~ft~~) with either steel studs or 2 × 4 wood studs spaced a minimum of 406 mm (~~16~~~~in.~~~~in.~~) oc. Attach the sheathing substrate to the framing and include 3.2 mm (~~1~~~~8 in.~~~~in.~~) wide vertical and horizontal substrate joints. Flashing shall also be included in the sample preparation to ensure that the interface of the water-resistive barrier coating and flashing will not be affected by various loading conditions. Apply the joint treatments, if applicable, and water-resistive barrier coating to the sheathing and cured in accordance with the manufacturer's recommendations. The sheathing used in the test shall be the least shear-resistant sheathing material to which application of the water-resistive barrier coating is proposed for application.

5.6 Weathering (~~Ultraviolet Light Exposure, Wet/Dry Cycling, and Hydrostatic Exposure~~)Exposure):

5.6.1 Prepare five samples, a minimum of 102 mm × 152 mm (~~4~~~~4 in. × 6 in.~~~~in.~~) containing a 6.4 mm (~~1~~~~4 in.~~~~in.~~) wide joint for each substrate. Apply the joint treatment, if applicable, and the water-resistive barrier coating to the substrate according to the manufacturer's recommended application instructions. Sheathing specimens shall consist of two sheathing sections assembled with the 6.4 mm (~~1~~~~4 in.~~~~in.~~) wide joint. Seal the sides of the samples with material impervious to water that need not be the water resistive barrier coating.

³ Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709-27709-2215, <http://www.aatcc.org>.

6. Apparatus

6.1 The description of apparatus in this section is general in nature consequently any set up capable of performing the test is acceptable.

6.2 ~~Tensile Bond~~Bond:

6.2.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Test Method [C297/C297M](#) or Test Method [E2134E2134/E2134M](#).

6.3 ~~Freeze Thaw~~Thaw:

6.3.1 The apparatus shall be capable of subjecting specimen uniformly to test conditions and cycles described in Test Method [E2485E2485/E2485M](#).

6.4 ~~Water Resistance~~Resistance:

6.4.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Practice [D2247](#) for 14 days.

6.5 ~~Water Vapor Transmission~~Transmission:

6.5.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Test Method [E72](#) and [8.4.1](#) of ~~this standard~~these test methods.

6.6 ~~Durability (Transverse Load, Racking, Environmental Conditioning, and Water Penetration)~~Penetration):

6.6.1 ~~Transverse Load~~Load:

6.6.1.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Test Method [E1233E1233/E1233M](#) and [8.5.1.1](#) of ~~this standard~~these test methods.

6.6.2 ~~Racking~~Racking:

6.6.2.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Test Methods [E72](#) and [8.5.2.1](#) of ~~this standard~~these test methods.

6.6.3 ~~Environmental Conditioning~~Conditioning:

6.6.3.1 The apparatus for the water spray shall be capable of uniformly wetting the entire panel surface. The apparatus for radiant heat shall be capable of producing conditions described in [8.5.3.1](#) of ~~this standard~~these test methods.

6.6.4 ~~Water Penetration~~Penetration:

6.6.4.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Test Method [E331](#) and [8.5.4.1](#) of ~~this standard~~these test methods.

6.7 ~~Weathering~~Weathering:

6.7.1 ~~Ultraviolet Light Exposure~~Exposure:

6.7.1.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in Test Methods [D2898](#), Method B and [8.6.1.1](#) of ~~this standard~~these test methods.

6.7.2 ~~Wet/Dry Cycling~~Cycling:

6.7.2.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in [8.6.2](#) of ~~this standard~~these test methods.

6.7.3 ~~Hydrostatic Pressure~~Pressure:

6.7.3.1 The apparatus shall be capable of subjecting the specimen uniformly to test conditions described in AATCC 127 and [8.6.3.1](#) of ~~this standard~~these test methods.

7. Conditioning

7.1 7.1 Dry or cure test samples a minimum of 28 days for cementitious materials and 7 days for acrylic materials under ambient conditions prior to testing.

8. Procedure

8.1 ~~Tensile Bond~~Bond:

8.1.1 ~~8.1.1~~ Conduct tests in accordance with Test Methods [C297/C297M](#) or [E2134E2134/E2134M](#).

8.2 ~~Freeze Thaw~~Thaw:

8.2.1 Conduct tests in accordance with Section 9.2 of Test Method [E2485E2485/E2485M](#).

8.3 ~~Water Resistance~~Resistance:

8.3.1 Conduct tests in accordance with Practice [D2247](#) for 14 ~~days~~days.

8.3.2 Conduct periodic inspection of the samples. Testing may be concluded sooner if cracking, erosion or delamination from the substrate is noted.

8.4 ~~Water Vapor Transmission~~Transmission:

8.4.1 Condition the samples at $24^{\circ}\text{C} \pm 3^{\circ}\text{C}$ (75°F [$75 \pm 5^{\circ}\text{F}$] 5°F) and $50\% \pm 5\%$ relative humidity for 40 ~~hour~~h prior to testing.