



ACCEPTANCE CRITERIA FOR TROWEL-, SPRAY- OR ROLLER-APPLIED WATER-RESISTIVE COATINGS USED AS WEATHER-RESISTIVE BARRIERS OVER EXTERIOR CEMENTITIOUS WALL COVERINGS

AC209

Approved September 2002

Effective October 1, 2002

(Editorially revised November 2006)

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*[®] reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (|) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (→) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

Copyright © 2006

ACCEPTANCE CRITERIA FOR TROWEL-, SPRAY- OR ROLLER-APPLIED WATER-RESISTIVE COATINGS USED AS WEATHER-RESISTIVE BARRIERS OVER EXTERIOR CEMENTITIOUS WALL COVERINGS

(NOTE: This criteria has been revised in its entirety.)

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for trowel-, spray- or roller-applied water-resistive coatings to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 and 2003 *International Building Code*[®] (IBC), the 2006 and 2003 *International Residential Code*[®] (IRC) and the 1997 *Uniform Building Code*[™] (UBC). Bases of recognition are 2006 and 2003 IBC Section 104.11, 2006 and 2003 IRC Section R104.11 and UBC Section 104.8.11.

The reason for the development of this acceptance criteria was to establish a basis for evaluation of proprietary coating systems that are used on exterior walls as alternatives to the water-resistive barriers specified in Section 1404.2 of the 2006 and 2003 IBC, the weather-resistant sheathing paper specified in Section R703.2 of the 2006 and 2003 IRC, and the weather-resistive barriers specified in Section 1402.1 of the UBC.

1.2 Scope: The coatings shall be covered with either a code-complying exterior wall covering, or one that is recognized in a current ICC-ES evaluation report. Substrates that can be considered under this criteria are existing exterior cementitious wall coverings.

When the water-resistive coating is intended to be the intervening material between two coats of exterior cementitious coatings, detrimental relative movement of the system shall be considered.

1.3 Codes and Reference Standards:

1.3.1 2006 *International Building Code*, International Code Council.

1.3.2 2006 *International Residential Code*, International Code Council.

1.3.3 2003 *International Building Code*, International Code Council.

1.3.4 2003 *International Residential Code*, International Code Council.

1.3.5 1997 *Uniform Building Code*.

1.3.6 AATCC, Test Method 127-1998, Water Resistance: Hydrostatic Pressure Test, American Association of Textile Chemists and Colorists.

1.3.7 ASTM C 297-94, Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions, ASTM International.

1.3.8 ASTM D 2247-97, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity, ASTM International.

1.3.9 ASTM E 72, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction, ASTM International. (See Table 1 for editions.)

1.3.10 ASTM E 96, Standard Test Method for Water Vapor Transmission of Materials, ASTM International. (See Table 1 for editions.)

1.3.11 ASTM E 331, Standard Test Method for Water Penetration of Exterior Windows, Skylight, Doors and Curtain Walls by Uniform Static Air Pressure Difference, ASTM International. (See Table 1 for editions.)

1.3.12 ASTM E 1233-97, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and doors by Cyclic Static Air Pressure Differential, ASTM International.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description:

2.1.1.1 A complete description of the water-resistive coating material, including base material and the thinning agent, shall be submitted and shall include the following, as applicable:

2.1.1.2 Percent-solids content of the water-resistive coating material.

2.1.1.3 Type and amount of priming material applied to the substrate prior to the application of the coating.

2.1.1.4 Amount of liquid material per shipping container, and density.

2.1.1.5 Statements on product-use limitations, including ultraviolet exposure.

2.1.2 Installation Instructions:

2.1.2.1 Printed installation procedures, available to the installer, shall be submitted, and shall include information as indicated below:

2.1.2.2 Application rate of liquid material applied to substrate, measured in gallons per square foot (l/m^2), and dry film thickness, shall be specified. Application procedures shall specify substrates. Conditions necessary for proper application, such as ambient temperature, site conditions (such as wet or muddy), and the material temperature, shall be included, as applicable.

2.1.2.3 Substrate preparation shall address the following:

2.1.2.3.1 Removal of deleterious materials that may affect bond and performance.

2.1.2.3.2 Treatments of voids, cracks, substrate joints and other excessively rough areas.

2.1.2.3.3 Applications of primers and other substrate conditioning materials with the water-resistive coating material.

2.1.2.3.4 Age of substrate, and substrate temperature at time of preparation and coating application.

2.1.2.4 Cure time, drying period and other time-related requirements shall be specified.

2.1.2.5 Preparation of materials prior to application, including components, proportions, temperature and humidity conditions, method of mixing and pot life of mixture, shall be specified.

ACCEPTANCE CRITERIA FOR TROWEL-, SPRAY- OR ROLLER-APPLIED WATER-RESISTIVE COATINGS USED AS WEATHER-RESISTIVE BARRIERS OVER EXTERIOR CEMENTITIOUS WALL COVERINGS

2.1.2.6 Type, location, and installation procedures for all flashing, counterflashing, caulking and other special treatments shall be specified.

2.1.2.7 Illustrative details shall be provided, showing water-resistive coating application, including interface with terminations, openings, penetrations, and other discontinuities, as applicable.

2.1.3 Packaging and Identification: A description of the method of packaging and identifying the material shall be submitted. Labeling for field identification shall include the following:

1. Name and address of manufacturer.
2. Product name.
3. Identification of components.
4. Lot or batch number.
5. Quantity of material in packaged mix.
6. Storage instructions.
7. Specific mixing instructions.
8. Curing instructions.
9. Expiration date (when applicable).
10. ICC-ES evaluation report number (ICC ES ESR-xxxx).

2.1.4 Field Preparation:

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Sampling of the test specimens for tests under this criteria shall comply with Section 3.1 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

- 3.1** Tensile bond testing as set forth in Section 4.1.
- 3.2** Freeze-thaw testing as set forth in Section 4.2.
- 3.3** Water-resistance testing as set forth in Section 4.3.
- 3.4** Water-vapor transmission testing as set forth in Section 4.4.
- 3.5** Water-penetration testing as set forth in Section 4.5.
- 3.6** Racking testing as set forth in Section 4.6.
- 3.7** Crack bridging and water resistance testing as set forth in Section 4.7.

EXCEPTION: This test may be waived when the coating is covered with a sheet-based weather- or water-resistive barrier complying with the applicable code.

4.0 TEST METHODS

4.1 Tensile Bond Testing:

4.1.1 Testing shall comply with ASTM C 297. Specimens shall be representative of those used in actual construction.

4.1.1.1 Five specimens shall be prepared by applying the water-resistive coating to the cementitious wall covering. The purpose of this test is to determine the adhesive performance of the coating when applied to a substrate.

4.1.1.2 Five specimens, without joints, shall be prepared by applying the water-resistive coating and the joint treatment material to the cementitious wall covering. The purpose of this test is to determine the adhesive performance of the coating and joint treatment when applied to a substrate.

4.1.1.3 For each flashing (including weep screed) material for which recognition is sought, five specimens shall be prepared by applying the water-resistive coating, and the flashing treatment, to the flashing material. The purpose of this test is to determine the adhesive performance of the coating and flashing treatment when applied to flashing.

4.1.2 Conditions of Acceptance: The flatwise tensile strength of each specimen shall be a minimum of 15 psi (105 kPa).

4.2 Freeze-thaw Tests:

4.2.1 For the cementitious wall covering, five 6-inch-square (23 226 mm²) specimens are tested. Cementitious wall covering specimens shall consist of either two cementitious wall covering sections assembled with a 1/8-inch-wide (3.2 mm) joint, or one cementitious wall covering section with a 1/8-inch-wide-by-1/4-inch-deep (3.2 mm by 6.4 mm) joint cut into the section. The joint shall be treated and the water-resistive coating shall be applied to the substrate surface in accordance with the manufacturer's recommended application instructions. The backs 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.

4.2.2 Specimens shall be subjected to 10 freeze-thaw cycles. Each cycle shall consist of air-drying at a temperature of 120°F (49°C) for a minimum of eight hours, followed by total immersion in water at 70°F to 80°F (21.1°C to 26.7°C) for eight hours, and exposure to a temperature of -20°F (-28.9°C) for 16 hours.

4.2.3 Conditions of Acceptance: Failure is defined as surface changes, as viewed by minimum 5x magnification, such as cracking, checking, crazing, erosion or other characteristics, that may affect performance as a weather-resistive barrier. Failure is also defined as delamination, or indications of delamination between components.

4.3 Water-resistance Testing:

4.3.1 For the cementitious wall covering, three specimens, a minimum of 4 inches by 6 inches (102 mm by 152 mm) in size, and containing a 1/8-inch-wide (3.2 mm) joint, shall be tested. Cementitious wall covering specimens shall consist of either two cementitious wall covering sections assembled with a 1/8-inch-wide (3.2 mm) joint, or one cementitious wall covering section with a 1/8-inch-wide-by-1/4-inch-deep (3.2 mm by 6.4 mm) joint cut into the section. The joint shall be treated and the water-resistive coating applied to the substrate surface in accordance with the manufacturer's recommended application instructions. The backs and sides of the specimens shall be sealed with an impervious material that need not be the coating.

**ACCEPTANCE CRITERIA FOR TROWEL-, SPRAY- OR ROLLER-APPLIED
WATER-RESISTIVE COATINGS USED AS WEATHER-RESISTIVE BARRIERS
OVER EXTERIOR CEMENTITIOUS WALL COVERINGS**

Specimens shall be representative of those used in actual construction.

4.3.2 Testing shall be in accordance with ASTM D 2247. Periodic inspections shall be conducted. Testing may be concluded after 14 days, or after deleterious effects of exposure to water are observed.

4.3.3 Conditions of Acceptance: There shall be no deleterious effects from 14 days of exposure to water.

4.4 Water-vapor Transmission Testing:

4.4.1 Three specimens of the water-resistive coating shall be prepared by applying the coating, at the recommended thickness, to a nonadhesive surface. After curing, the coating films shall be removed from the surface; the average thickness shall be determined from material density, area, and weight. The films shall be used to set up three wet cups in accordance with ASTM E 96, Water Method. Specimens are conditioned at 75°F ± 5°F (24°C ± 3°C) and 50 percent relative humidity for 40 hours before testing. Each cup shall be placed in a room with controlled conditions of 75°F ± 5°F (24°C ± 3°C) and 50 percent relative humidity. Reduction in weight shall be recorded daily. Water vapor transmission and permeance shall be calculated in accordance with Section 13 of ASTM E 96, and reported in grams per square meter per 24 hours and perms, respectively.

4.4.2 Conditions of Acceptance: Water vapor transmission shall satisfy one of the grade requirements in Table 14-1-A of UBC Standard 14-1 or Table 1 of the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38).

4.5 Water Penetration Testing:

4.5.1 Cementitious Wall Covering Substrate: Three assemblies shall be prepared by applying the water-resistive coating to the cementitious wall covering substrate. The cementitious wall covering substrate shall be applied to gypsum sheathing in accordance with the cementitious wall covering manufacturer's instructions and to 2-by-4 wood framing members. The test assemblies shall be a minimum of 4 feet by 8 feet (1219 mm by 2338 mm) in size, and substrates shall include at least two 1/16-inch-wide (1.6 mm) horizontal saw cuts through the substrate per stud bay. In addition, a minimum of twenty-four 1/16-inch-diameter (1.6 mm) holes shall be drilled through the cementitious wall covering. Each specimen shall be tested in accordance with ASTM E 1233, Procedure A, with 80 percent positive design load (design load is defined as ultimate load with a safety factor of 3.0 imposed) as the maximum test load. The specimens shall be cycled for a minimum of 10 cycles. Each specimen shall then be tested in accordance with ASTM E 331. A 6.24 psf (298 Pa) air-pressure differential shall be maintained, across the test specimens, for 75 minutes.

4.5.2 Conditions of Acceptance: There shall be no water penetration on the plane of the exterior-facing side of the cementitious wall covering. The substrate shall be removed after the test to make this determination.

4.6 Racking Test: The intent of this test is to evaluate the crack resistance of the water-resistive coating when the coating is subjected to racking movements as might occur under normal aging conditions of a structure. Test setup,

measurements and application of loads shall comply with ASTM E 72, without hold-downs and as modified below.

4.6.1 Cementitious Wall Covering Substrate: Three assemblies shall be prepared by applying the water-resistive coating to the cementitious wall covering substrate. The cementitious wall covering substrate shall be applied to gypsum sheathing in accordance with the cementitious wall covering manufacturer's instructions and to 2-by-4 wood framing members. The test assemblies shall be a minimum of 8 feet by 8 feet (2438 mm by 2438 mm) in size and shall include at least two 1/16-inch-wide-by-1/4-inch-deep (1.6 mm by 6.4 mm) vertical saw cuts and two 1/16-inch-wide-by-1/4-inch-deep (1.6 mm by 6.4 mm) horizontal saw cuts. In addition, a minimum of twenty-four 1/16-inch-diameter (1.6 mm) holes shall be drilled through the substrate and the gypsum sheathing. Specimen construction shall be based on minimum allowable conditions. Application of load shall be in increments as described in the ASTM E 72 test method. Throughout the test, the coated surface of the wall shall be inspected for signs of cracking or shear pinching of the water-resistive coating within the field of the panel and at substrate cuts and holes.

4.6.2 Conditions of Acceptance: There shall be no failure of the coating at substrate joints, cuts or holes before failure of the coating in the field of the specimen. The results may be considered acceptable if there is no failure within the field or at the joints, cuts or holes when 1-inch (25 mm) net deflection is achieved.

4.7 Crack Bridging and Water Resistance Test:

4.7.1 Procedure: The purpose of this test is to evaluate the ability of the water-resistive coating, at substrate joints, to remain functional and watertight after exposure to movement of the joint.

Six specimens, with cementitious wall covering substrates, shall be prepared from 4-inch-by-6-inch (102 mm by 152 mm) substrate sections. Each specimen shall consist of the two substrate sections aligned so that the 6-inch-long (152 mm) edges are separated by 1/8 inch (3.2 mm). The water-resistive coating shall be applied to the joint per manufacturer's instructions and conditioned at 73 ± 4°F (22.8 ± 2.2°C) for seven days. After conditioning, the three samples shall be placed in a cold box, which is maintained at -20°F (-28.9°C) for seven days. Three additional samples shall be subjected to ultraviolet light exposure in accordance with Section 4.7.2. Specimens shall be then cycled between a 1/8-inch (3.2 mm) and 1/4-inch (6.4 mm) substrate edge separation for 100 cycles while the temperature is maintained at -20°F (-28.9°C). The rate of movement shall be 1/8 inch (3.2 mm) per hour. The cracked assembly shall be tested according to AATCC Test Method 127. A 6.24 psf (298 Pa) water pressure shall be applied to the surface. Test duration shall be a minimum of two hours.

4.7.2 Ultraviolet Light Exposure: Samples shall be exposed to light from ultraviolet sun lamps for 210 hours (10 hours per day for 21 days) in an enclosure. Ultraviolet light exposure shall be directed on the sample surfaces that will be exposed to sunlight in normal application. Lamps and enclosure shall be adjusted so the specimen temperature is between 135°F and 140°F (57°C and 60°C). Sunlamp bulbs shall be General Electric Type H275 RUV (275 W) or

ACCEPTANCE CRITERIA FOR TROWEL-, SPRAY- OR ROLLER-APPLIED WATER-RESISTIVE COATINGS USED AS WEATHER-RESISTIVE BARRIERS OVER EXTERIOR CEMENTITIOUS WALL COVERINGS

equivalent bulbs, providing UV characteristics of 5.0 W/m²/nm irradiance at a wavelength of 315 to 400 nm at 1 meter.

4.7.3 Conditions of Acceptance: There shall be no cracking of the coating, or bond failure between the coating and the substrate. There shall be no water penetration on the plane of the exterior facing side of the substrate.

5.0 QUALITY CONTROL

5.1 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

5.2 Third-party follow-up inspections are not required under this acceptance criteria.

6.0 EVALUATION REPORT RECOGNITION

6.1 Installation shall be by a contractor recognized by the evaluation report holder as being trained to perform such

installations. A list of the names and addresses of recognized contractors shall be maintained by the evaluation report holder, and shall be available to the code official or ICC-ES upon request.

6.2 2006 and 2003 IBC: For recognition under the IBC, special inspections are required at the jobsite in accordance with Sections 1704.1 and 1704.13 of the IBC. Duties of the inspector include verifying field preparation of materials, expiration dates, installation of components, curing of components, installation of joints and sealants.

6.3 UBC: An installation card, having the format shown in Figure 1, shall be completed by the recognized contractor and shall be presented to the building official, at the completion of each project. ■

TABLE 1—REFERENCED STANDARDS

STANDARD	DATE OF STANDARD		
	2006 IBC/IRC	2003 IBC/IRC	1997 UBC
ASTM E 72	2002	1998	1998
ASTM E 96	2000e01	2000	1995

