

# ACCEPTANCE CRITERIA FOR FOAM PLASTIC SHEATHING PANELS USED AS WATER-RESISTIVE BARRIERS

AC71

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## PREFACE

Evaluation reports issued by ICC Evaluation Service, LLC (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.

***Acceptance criteria are developed for use solely by ICC-ES for purposes of issuing ICC-ES evaluation reports.***

# ACCEPTANCE CRITERIA FOR FOAM PLASTIC SHEATHING PANELS USED AS WATER-RESISTIVE BARRIERS (AC71)

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements for foam plastic sheathing panels to be recognized in an ICC Evaluation Service, LLC (ICC-ES), evaluation report under the 2009 *International Building Code*<sup>®</sup> (2009 IBC), the 2009 *International Residential Code*<sup>®</sup> (2009 IRC), the 2006 *International Building Code*<sup>®</sup> (2006 IBC), the 2006 *International Residential Code*<sup>®</sup> (2006 IRC) and the 1997 *Uniform Building Code*<sup>™</sup> (UBC). The bases of recognition are IBC Section 104.11, IRC Section R104.11 and UBC Section 104.2.8.

The reason for the development of this criteria is to establish test requirements that will permit the foam plastic sheathing panels to be used as water-resistive barriers in combustible construction, since the codes do not provide requirements for the material to be used in this manner.

### 1.2 Scope:

**1.2.1** This criteria is limited to foam plastic insulation and associated joint sealing methods used on exterior walls as an alternative to the water-resistive barrier specified in Section 1404.2 of the IBC and Section R703.2 of the IRC; and the weather-resistive barrier specified in Section 1402.1 of the UBC.

**1.2.2** This criteria is limited to foam plastic insulation recognized in a current ICC-ES evaluation report showing compliance with Sections 3.4.1 or 3.4.3 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12).

**1.2.3** This criteria does not address the use of the foam plastic insulation as structural sheathing, resisting in-plane or out-of-plane loadings.

**1.2.4** This criteria does not require reporting of the water vapor transmission properties of the foam plastic insulation.

### 1.3 Definitions:

**1.3.1 Water-resistive Barrier:** For the purposes of this criteria, the term "water-resistive barrier" includes within its scope water-resistive barrier under Section 1404.2 of the IBC, water-resistive barrier under Section R703.2 of the IRC and weather-resistive barrier under Section 1402.1 of the UBC.

**1.3.2 Foam Plastic Sheathing Panels Used as Weather Resistive Barrier:** Foam plastic boards, sheets, or panels, when installed on an exterior wall with joint sealing methods or treatments, are intended to prevent water intrusion into the wall cavity. These products may be faced or unfaced.

**1.3.3 Joint-sealing Treatments:** Joint-sealing treatments are tapes, or caulks, or materials that are used to seal joints that may occur between two or more edges of the foam plastic insulation.

**1.3.4 Joint-sealing Methods:** Joint-sealing methods are mechanical edge treatments of foam plastic sheathing panels such as, but not limited to tongue and groove or ship-lapped edges.

### 1.4 Codes and Referenced Standards:

**1.4.1** 2009 *International Building Code*<sup>®</sup> (2009 IBC), International Code Council.

**1.4.2** 2009 *International Residential Code*<sup>®</sup> (2009 IRC), International Code Council.

**1.4.3** 2006 *International Building Code*<sup>®</sup> (2006 IBC), International Code Council

**1.4.4** 2006 *International Residential Code*<sup>®</sup> (2006 IRC), International Code Council.

**1.4.5** *Uniform Building Code*<sup>™</sup>.

**1.4.6** ASTM E 331-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference, ASTM International.

**1.4.7** AATCC, Test Method 127-1998, Water Resistance: Hydro Static Pressure Test, American Association of Textile Chemists and Colorists.

## 2.0 BASIC INFORMATION

**2.1 General:** The following information shall be submitted:

**2.1.1 Product Description:** Complete information concerning material specifications, thickness, size and the manufacturing process shall be submitted for the foam plastic insulation. Information concerning joint treatment materials, including manufacturer and material specifications, shall be provided.

**2.1.2 Installation Instructions:** Installation details and limitations, fastening methods, joint treatments, and face treatments.

**2.1.3 Packaging and Identification:** A description of the method of packaging and field identification of the system components. Identification provisions on the foam plastic insulation and on proprietary treatment materials shall include the evaluation report number and the name or logo of the inspection agency.

**2.1.4 Field Preparation:** A description of the methods of field-cutting, application and finishing.

**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, and shall be accredited for the scope of tests covered by this criteria.

**2.3 Test Reports:** Test reports shall comply with AC85.

**2.4 Product Sampling:** Products for testing shall be sampled in accordance with Section 3.2 of AC85. Upon submission of initial, qualifying test data to ICC-ES, the manufacturer shall submit an affidavit certifying that the product tested is representative of the standard manufactured product for which recognition is being sought. Alternately, the manufacturer may choose to have the product sampled independently by an accredited inspection agency (in lieu of the affidavit).

## 3.0 TEST AND PERFORMANCE REQUIREMENTS

Reports of the following tests shall be submitted:

### 3.1 Foam Plastic Insulation—Water-resistance:

**3.1.1** Water-resistance testing shall be conducted on the foam plastic insulation for which recognition is sought.

**3.1.2** Three specimens [each 8 inches (203 mm) square] of the foam plastic insulation shall be at the minimum thickness and density intended for use and be

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faced (if facers are used) with the material for which recognition is sought.

**3.1.3** The test specimens shall be weathered in accordance with Section 3.5 of this criteria.

**3.1.4** Water-resistance tests shall be conducted on the weathered specimens in accordance with AATCC Test Method 127. Testing in accordance with AATCC Test Method 127 shall be such that the specimens shall be held at a hydrostatic head of 21.6 inches (55 cm) for a period of 5 hours.

**3.1.5 Conditions of Acceptance:** Weathered specimens shall not exhibit water leakage on the underside of any specimen.

### 3.2 Joint-sealing Treatments:

**3.2.1 General:** Joint-sealing treatments shall meet the requirements of Section 3.2.2 and 3.4 of this criteria. Testing shall be conducted for each type of joint with respect to the substrate materials that form foam-to-foam or foam-to-flashing joints.

**3.2.2** Three specimens of each joint-sealing treatment are required. The test specimens shall be prepared with 3-inch-by-6-inch (76 mm by 152 mm) pieces of the foam plastic insulation and the joint sealing treatments for which recognition is being sought. Each specimen includes the two pieces of substrate materials aligned so that the 6-inch (152 mm) edges are butt-jointed. The joint-sealing treatment is applied to the pieces along the 6 in. (152 mm) dimension of the joint. The sample joint shall be unbacked unless recognition is sought for other joint constructions.

**3.2.3** The joint-sealing treatment specimens shall be exposed to the weathering conditions of Section 3.5 of this criteria.

**3.2.4** Water-resistance tests shall be conducted on the weathered specimens in accordance with AATCC Test Method 127. Testing in accordance with AATCC Test Method 127 shall be such that the specimens shall be held at a hydrostatic head of 21.6 inches (55 cm) for a period of 5 hours. Testing shall be conducted such that the joint treatment is exposed to the hydrostatic head. In the case of tapes, the hydrostatic head shall be positioned over both the joint area and the interface of the tape and the foam insulation.

**3.2.5 Conditions of Acceptance:** Weathered specimens shall not exhibit water leakage on the underside of any specimen.

**3.3 Joint-sealing Methods:** Joint-sealing methods that incorporate tongue and groove, ship-lap joints or similar methods without treatments, shall be evaluated using Section 3.4 of this criteria.

### 3.4 Water Penetration Test of Wall Assembly:

**3.4.1 General:** Tests shall be conducted on a wall assembly containing the foam plastic insulation with joint sealing methods or treatments applied to framing in accordance with IBC Section 1403.2, Exception 2, and ASTM E 331, as follows:

**3.4.1.1** Test assemblies shall be at least 4 feet wide by 8 feet high (1219 mm by 2438 mm) in size. The foam plastic sheathing panels as well as the joint sealing treatments or methods shall be installed in the manner for which recognition is sought. Assemblies shall include at

least one vertical joint representative of normal installation methods. When recognition is sought for horizontal joints, assemblies shall include at least two horizontal joints. All joints shall be unbacked unless other specific recognition is sought.

**3.4.1.2** The assemblies shall be tested without exterior wall coverings. Openings or penetrations in the test assemblies are not required. When the assembly is tested with openings and penetrations, Section 4.2 of this criteria shall not apply.

**3.4.1.3** The test assemblies shall be tested at a minimum differential pressure of 6.24 psf (0.297 kN/m<sup>2</sup>).

**3.4.1.4** The test assemblies shall be subjected to a minimum test exposure duration of 2 hours.

**3.4.1.5 3.4.1.5 Conditions of Acceptance:** Water shall not penetrate to the unexposed face of the foam plastic insulation.

### 3.5 Weathering Tests:

**3.5.1** When weathering tests are required by Section 3.1 or 3.2 of this criteria, specimens shall be subjected to ultraviolet light exposure in accordance with Section 3.5.2 followed by accelerated aging in accordance with Section 3.5.3.

**3.5.2 Ultraviolet Light Exposure:** Samples shall be exposed to light from ultraviolet sun lamps for 210 hours (10 hours per day for 21 days). 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 equivalent bulbs, providing UV characteristics of 5.0 W/m<sup>2</sup>/nm irradiance at a wavelength of 315 to 400 nm at 1 meter.

**3.5.3 Accelerated Aging:** The specimens shall be subjected to 25 cycles of drying and soaking as follows:

1. Oven drying at 120°F (49°C) for three hours, with all surfaces exposed.
2. Immersion in room-temperature water for three hours, with all surfaces exposed.
3. After removal from the water, specimens are blotted dry, then air-dried for 18 hours at a 75°F ± 5°F (23.8°C ± 2.8°C) room temperature, with all surfaces exposed.

**3.5.4 Conditions of Acceptance:** There shall be no visible delamination or blistering of the facing layer. Additionally specimens must be subjected to the water resistance test described in Sections 3.1 and 3.2.

### 4.0 SPECIAL REQUIREMENTS

**4.1** For the IBC, IRC and UBC, a vapor retarder complying with Section 1405.3 of the 2009 IBC, Section 1403.2 of the 2006 IBC, Section R601.3 of the 2009 IRC or Section R318.1 of the 2006 IRC shall be installed on the warm-in-winter side of the wall.

**4.2** When the system has not been tested in accordance with Section 3.4 with penetrations and openings, the evaluation report on the foam plastic insulation shall require the foam plastic to be specifically recognized in a current ICC-ES evaluation report on a wall covering

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system. The evaluation report on the wall covering system shall provide flashing details specific to the foam plastic insulation, and the wall covering system incorporating the foam plastic insulation shall be tested in accordance with IBC Section 1403.2, Exception 2.

**5.0 QUALITY CONTROL**

**5.1 Joint-sealing Treatment:** Joint-sealing treatments are required to be manufactured under a quality control program documented in accordance with the ICC-ES Acceptance Criteria for Quality Documentation (AC10).

Follow-up inspections by an inspection agency are not required under this criteria.

**5.2 Foam Plastic:** All foam plastic boards shall be listed and labeled as set forth in Section 2603.2 of the IBC, Section R316.2 of the 2009 IRC, Section R314.2 of the 2006 IRC, or Section 2602.2 of the UBC. Compliance of foam plastic is based on a current applicable evaluation report, on the foam plastic, issued by ICC-ES; if no such report exists, foam plastic shall comply with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12).