



## ACCEPTANCE CRITERIA FOR TERMITE-RESISTANT FOAM PLASTICS

AC239

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### 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.

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

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# ACCEPTANCE CRITERIA FOR TERMITE-RESISTANT FOAM PLASTICS (AC239)

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements for termite-resistant foam plastics that are to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*<sup>®</sup> (IBC), the 2006 *International Residential Code*<sup>®</sup> (IRC), the BOCA<sup>®</sup> *National Building Code/1999* (BNBC), the 1999 *Standard Building Code*<sup>®</sup>, the 1997 *Uniform Building Code*<sup>™</sup> (UBC), and the 1998 *International One- and Two-Family Dwelling Code*<sup>®</sup> (I1&2). The bases of recognition are IBC Section 104.11, and IRC Section R104.11. Applicable code sections are IBC Section 2304.11 (Protection Against Decay and Termites), IBC Section 2603.8 (Protection against Termites), IRC Section R320 (Protection against Subterranean Termites), IRC Section R320.5 (Foam Plastic Protection), BNBC Section 2311.0 (Naturally Durable and Preservative-Treated Wood), SBC Section 2603.3 (Protection from Termite Damage), UBC Section 2306 (Decay and Termite Protection), and I1&2 Section 323.4 (Foam Plastic Protection).

The reason for the development of this criteria is to allow evaluation of termite-resistant foam plastic, since Sections 2304.11 and 2603.8 of the IBC and Sections R320 and R320.5 of the IRC do not provide test methods and performance requirements for termite resistance.

**1.2 Scope:** The use of termite-resistant foam plastic insulation shall be permitted on the exterior face of foundation walls, under interior or exterior foundation walls or slab foundations below grade, or where located within 6 inches (152 mm) of exposed earth, in areas where the probability of termite infestation is "very heavy" as determined in accordance with IBC Figure 2603.8, IRC Figure R301.2(6) and SBC Figure 2304.1.4.

**1.3 Codes and Reference Standards:** Where standards are referenced in this guideline, these standards shall be applied consistently with the code upon which compliance is based.

### 1.3.1 Codes and Referenced Standards:

**1.3.1.1** 2006 *International Building Code*<sup>®</sup> (IBC), International Code Council.

**1.3.1.2** 2006 *International Residential Code*<sup>®</sup> (IRC), International Code Council.

**1.3.1.3** BOCA<sup>®</sup> *National Building Code/1999* (BNBC).

**1.3.1.4** 1999 *Standard Building Code*<sup>®</sup> (SBC).

**1.3.1.5** 1997 *Uniform Building Code*<sup>™</sup> (UBC).

**1.3.1.6** 1998 *International One- and Two-Family Dwelling Code*<sup>®</sup> (I1&2), International Code Council.

**1.3.2** AWPA E7-07<sup>®</sup>, Standard Method of Evaluating Wood Preservatives by Field Tests with Stakes, American Wood Protection Association.

**1.3.3** ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12).

**1.3.4** AWPA E1-06<sup>®</sup>, Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites, American Wood Protection Association.

**1.3.5** ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377).

### 1.4 Definitions:

**Termite-resistant Foam Plastic:** Foam plastic insulations that are proprietary chemically, and that comply with the requirements in this guideline.

## 2.0 BASIC INFORMATION

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

**2.1.1 Product Description:** Complete information concerning material specifications, thickness, standard sizes and the manufacturing process for the termite-resistant foam plastic insulation. The material specifications for the treatment chemical for the foam plastic shall be provided. The treatment chemical shall be registered with the EPA as an approved termite treatment for use in plastic materials..

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

**2.1.3 Packaging and Identification:** A description of the method of packaging and field identification of the termite-resistant foam plastic. Identification provisions must include the evaluation report number, product name and the name or logo of the accredited inspection agency.

**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 the ICC-ES Acceptance Criteria for Test Reports (AC85).

**2.4 Product Sampling:** Products shall be sampled in accordance with Section 3.1 of AC85 and Section 4.1.6 of this criteria.

## 3.0 TEST AND PERFORMANCE REQUIREMENTS

**3.1 General:** Documentation shall be submitted for foam plastic insulation demonstrating compliance with AC12 or AC377, either through a current ICC-ES evaluation report or by submittal of complete testing data in accordance with AC12 or AC377 .

**3.2 Termite Resistance:** Termite-resistant foam plastics shall be reviewed on the basis of field evaluation against termites. The field testing shall be in accordance with test methods for the evaluation of wood against termites. The testing shall account for each type and/or species of subterranean termites, e.g., Formosan.

## 4.0 TEST METHODS

The test method is AWPA E7. This method shall be modified to suit the intended application of the termite-resistant foam plastic.

**4.1 Test Installation:** The selected test method shall include the following minimum installation requirements:

**4.1.1** The test assembly shall be designed to evaluate the specific type of application anticipated for the termite-resistant foam plastic, and shall be representative of the final installed product. The assemblies tested shall include

## ACCEPTANCE CRITERIA FOR TERMITE-RESISTANT FOAM PLASTICS (AC239)

the anticipated termite-resistant foam plastic along with control assemblies for comparison. The assemblies shall include the use of potential above-grade bait wood.

**4.1.2** The assemblies shall be exposed to a minimum of two test plots in a location with very heavy termite infestation as shown in Figure 2603.8 of the IBC or Figure R301.2(6) of the IRC; or in Hilo, Hawaii.

**4.1.2.1** Alternately, the assemblies shall be exposed to a combination of one test plot in a location with very heavy termite infestation as shown in Figure 2603.8 of the IBC, or Figure 301.2(6) of the IRC, or in Hilo, Hawaii; and laboratory data shall be submitted verifying resistance to subterranean termites in accordance with AWPA E1.

**4.1.3** There shall be a minimum of five replicates for each assembly type per test plot.

**4.1.4** Each plot shall be determined suitable based upon evaluation of wood monitoring stakes that have been placed in a grid pattern set approximately 10 feet (3,048 mm) on center.

**4.1.5** Assemblies shall be arranged in a randomized complete block design within the plots.

**4.1.6** Product sampling shall be in accordance with Section 2.4, with the following modifications:

**4.1.6.1** The testing agency shall provide in the final test report submitted to ICC-ES: (a) a written description of the sample preparation and treatment method; and (b) the preservative retention achieved during the impregnation stage.

**4.1.6.2 Exception:** Existing samples in long-term (multiple-year) testing may be accepted provided an accredited inspection agency reviews all records on sample preparation and identification and provides verification of the authenticity of these samples to the testing agency and to ICC-ES staff.

**4.2 Inspections:** The selected test method shall include the following minimum inspection requirements:

**4.2.1** The test assemblies shall be inspected a minimum of once per year.

**4.2.2** The monitoring stakes shall be inspected a minimum of once per year and replaced as necessary.

**4.3 Conditions of Acceptance:** After a minimum of 36 months, the test assemblies shall be evaluated for damage.

**4.3.1** An analysis of damage to the monitoring stakes adjacent to test assemblies shall be completed to ensure that the assemblies have been subjected to a uniform termite exposure.

**4.3.2** The assemblies shall be destructively evaluated for termite tunneling and damage to the foam plastic. The damage to the foam plastic shall be compared to control assemblies.

**4.3.3** The acceptability of the foam plastic shall be determined on the basis of termite damage based upon statistical analysis or AWPA E7 Section 9. An analysis of variance shall be applied to the data with a suitable statistical method of separation. The termite-resistant foam plastic shall have no more than 5 percent damage or a termite rating of 8 or greater in accordance with AWPA E7. The results from control samples of untreated foam plastic shall be compared to the results for termite-resistant foam plastic.

**4.3.3.1** Where AWPA E1 testing has been conducted, the termite-resistant foam plastic shall have a termite damage rating of 8 or greater. The results from control samples of untreated foam plastic shall be compared to the results for termite-resistant foam plastic.

**4.3.4** A testing laboratory accredited for the evaluation of termite-resistance shall provide an analysis and interpretation of the results.

**4.4 Analysis of Test Documentation:** Test data provided in accordance with Section 4.1 shall be reviewed and an analysis shall be prepared by an independent third party, either an accredited test laboratory or an independent wood scientist/engineer/entomologist. The analysis shall provide conclusions that the product provides protection against subterranean termites at the retention (loading) and penetration, AWPA use category and performance characteristics recommended for the product, including in areas of known Formosan termite attacks.

## 5.0 QUALITY CONTROL

**5.1** The product shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service (IAS), Inc., or as otherwise acceptable to ICC-ES.

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

## 6.0 EVALUATION REPORT RECOGNITION

**6.1** The termite-resistant foam plastic, in addition to meeting requirements of this criteria, shall comply with AC12.

**6.2** The termite-resistant foam plastic in compliance with this criteria shall be considered termite-resistant and shall not be restricted under Section 2603.8 of the IBC, Section R320.5 of the IRC, Section 2603.3 of the SBC, or Section 323.4 of the I1&2.

**6.3** The product evaluation report shall include a restriction on use where there is exposure to Formosan and other subterranean termites unless the field test results substantially demonstrate resistance to Formosan termites and other subterranean termites. ■