



February 27, 2008

**TO: PARTIES INTERESTED IN EVALUATION REPORTS ON WOOD STRUCTURAL PANEL ROOF SHEATHING FACTORY-LAMINATED WITH AN ALTERNATIVE ROOF UNDERLAYMENT**

**SUBJECT: Acceptance Criteria for Wood Structural Panel Roof Sheathing Factory-laminated with an Alternative Roof Underlayment, Subject AC266-0208-R1 (MO/CA/MB)**

Dear Madam or Sir:

Enclosed is a copy of the subject revised acceptance criteria approved by the ICC-ES Evaluation Committee on February 6, 2008, effective March 1, 2008. The following revisions were approved by the committee:

1. Added references to slate and slate-type roof coverings to Section 1.2.4: wood shakes and wood shingles roof coverings to Section 1.2.5; and built-up roof coverings to Section 1.2.6.
2. Added a new Section 4.1.2.2 to allow design of roof sheathing in accordance with the provisions of the applicable code. When the panels are not fastened in accordance with the applicable code, they shall be tested for wind uplift in accordance with Section 4.1.2.1.
3. Revised Section 4.2 (roof classification fire testing) and Section 4.4.3 (wind-driven rain testing) to allow the accredited test laboratories to select and test a minimum of two representative roof covering materials of minimum specifications for a specific roof covering category. This will allow the laminated sheathing manufacturer to list a roof covering material using a product specification without listing the roof covering manufacturer in the evaluation report. A companion revision to Section 6.6 of the criteria allows the specifying of tested minimum representative roof coverings in a category without using manufacturer's names.
4. Revised Section 6.4 to allow use of the product with conditioned attics under the *International Residential Code*® (IRC).
5. Revised Section 6.1 to allow installation of the panels in Type III-A, III-B and V-B construction.

Evaluation reports issued on or after the effective date noted above, and falling within the scope of this criteria, will be required to comply with the enclosed edition of the criteria. Evaluation reports issued prior to the effective date may be in compliance either with the enclosed acceptance criteria or with the previous edition. Evaluation reports based on a superseded version of an acceptance criteria must be brought into compliance with the most recent edition at the time the reports are reissued. Therefore, applicants should submit data verifying compliance at the time they apply for re-examination.

If you have any questions, please contact Michael O'Reardon, P.E. Senior Staff Engineer, at (800) 423-6587, extension 5685. You may also reach us by e-mail at [es@icc-es.org](mailto:es@icc-es.org).

Yours very truly,

A handwritten signature in black ink that reads "Kurt Stochlia". The signature is written in a cursive, flowing style.

Kurt Stochlia, P.E.  
Vice President

KS/raf

Enclosure

cc: Evaluation Committee



# ACCEPTANCE CRITERIA FOR WOOD STRUCTURAL PANEL ROOF SHEATHING FACTORY-LAMINATED WITH AN ALTERNATIVE ROOF UNDERLAYMENT

**AC266**

**Approved February 2008**

**Effective March 1, 2008**

**Previously approved October 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*<sup>®</sup> 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.

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# ACCEPTANCE CRITERIA FOR WOOD STRUCTURAL PANEL ROOF SHEATHING FACTORY-LAMINATED WITH AN ALTERNATIVE ROOF UNDERLAYMENT

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this criteria is to establish requirements for wood structural panel roof sheathing factory-laminated with an alternative roof underlayment to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*<sup>®</sup> (IBC) and the 2006 *International Residential Code*<sup>®</sup>. Bases of recognition are IBC Section 104.11 and IRC Section R104.11. Applicable IBC code sections are Sections 1503 (Weather Protection), 1504 (Performance Requirements), 1505 (Fire Classification), 1506 (Materials), 1507 (Requirements for Roof Coverings), 1609 (Wind Loads), 2301.2 (General Design Requirements—Wood), 2303 (Minimum Standards and Quality—Wood), 2303.1.4 (Wood Structural Panels), and 2308.10.8 (Roof Sheathing). Applicable IRC code sections are Sections R803 (Roof Sheathing), R902 (Roof Classification), R903 (Weather Protection), R904 (Materials), R905.1 (Roof Covering Application), R905.2 (Asphalt Shingles), R905.3 (Clay and Concrete Tile), R905.4 (Metal Roof Shingles), R905.6 (Slate and Slate-Type Shingles), R905.7 (Wood Shingles), R905.8 (Wood Shakes), R905.9 (Built-up Roofs) and R905.10 (Metal Roof Panels).

The reason for the development of this criteria is to allow evaluation of the product described in this criteria as an alternative material that combines two products, roof sheathing and an underlayment, into one product, since the code does not provide test methods and performance requirements for documenting, for such a product, weather protection, roof fire classification, and wind uplift resistance.

**1.2 Scope:** This criteria is applicable to wood structural panel roof sheathing factory-laminated with an alternative roof underlayment for use as a combination roof sheathing and roof underlayment on buildings of Type III and V construction. The roofing system panels are limited to structural use panels as defined in PS-2 (Section 2303.1.4 of the IBC) or AC182 (ICC-ES Acceptance Criteria for Wood-based Structural-use Panels). The panels are limited to use with the following roof covering materials:

**1.2.1** Classified asphalt fiberglass shingle roof coverings on roofs with a slope of 2:12 or greater.

**1.2.2** Clay and concrete tile roof coverings on roofs with a slope of 2<sup>1</sup>/<sub>2</sub>:12 or greater.

**1.2.3** Metal shingles and panel roof coverings on roofs with a slope of 3:12 or greater.

**1.2.4** Slate and slate-type roof coverings on roofs with a slope of 4:12 or greater.

**1.2.5** Wood shakes and wood shingle roof coverings on roofs with a slope of 3:12 or greater.

**1.2.6** Built-up roof coverings on roofs with a slope of 0.25:12 or greater.

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

## 1.3.1 Codes:

**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.

## 1.3.2 ASTM International, Referenced Standards:

**1.3.2.1** ASTM D 3330/D 3330M-04, Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape.

**1.3.2.2** ASTM E 84-04, Standard Test Method for Surface Burning Characteristics of Building Materials.

**1.3.2.3** ASTM E 96-00<sup>e1</sup>, Standard Test Methods for Water Vapor Transmission of Materials.

**1.3.2.4** ASTM E 108-04, Standard Test Methods for Fire Test of Roof Coverings.

**1.3.2.5** ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

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

**1.3.2.7** ASTM G 152-04, Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials.

**1.3.2.8** ASTM G 154-00a<sup>e1</sup>, Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.

**1.3.2.9** ASTM G 155-04, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure on Non-Metallic Materials.

**1.3.3** UL 580-94, Standard for Tests for Uplift Resistance of Roof Assemblies, Underwriters Laboratories Inc.

**1.3.4** UL 790-98, Tests for Fire Resistance of Roof Covering Materials—with Revisions through July 1998.

**1.3.5** TAS 100-95.1, Test Procedure for Wind and Wind Driven Rain Resistance of Discontinuous Roof Systems, Florida Building Code 2004—Test Protocols for High Velocity Hurricane Zones.

**1.3.6** TAS 125-03, Standard Requirements for Metal Roofing Systems, Florida Building Code 2004—Test Protocols for High Velocity Hurricane Zones.

**1.3.7** TAS 202-94, Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure, Florida Building Code 2004—Test Protocols for High Velocity Hurricane Zones.

**1.3.8** ICC-ES Acceptance Criteria for Wood-based Structural-use Panels (AC182).

**1.3.9** DOC PS 2-92, Performance Standards for Wood-Based Structural-Use Panels, U.S. Department of Commerce.

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**1.4 Definitions:**

**1.4.1 Wood Structural Panel Roof Sheathing Laminated with an Alternative Roof Underlayment:** An OSB substrate complying with PS 2-92 (Section 2303.1.4 of the IBC) or AC182 for structural-use panels, factory-laminated with a proprietary water-resistive barrier. The panels may be supplied with a tongue-and-groove, square edged or machine edged profile on the substrate edges. The panels are installed with a proprietary seam seal installed at board joints, hips, valleys and ridges.

**2.0 BASIC INFORMATION**

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

**2.1.1 Product Description:** Complete information concerning panel and seam seal material specifications, thickness, size and the manufacturing process.

**2.1.2 Installation Instructions:** Installation details and limitations, fastener materials, and installation manual.

**2.1.3 Packaging and Identification:** A description of the method of packaging and field identification of the panel and seam seal material. Identification provisions 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.

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

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

**3.0 TEST AND PERFORMANCE REQUIREMENTS**

The wood structural panel roof sheathing laminated with an alternative roof underlayment shall be tested to document the performance characteristics indicated in Sections 3.1, 3.2, 3.3, 3.4 and 3.5 of this acceptance criteria.

**3.1 Structural:** The panels shall be tested for load span capacity and for wind uplift capacity except when installed using Section 2308 (Conventional Light-Frame Construction) of the IBC. The test methods are noted in Section 4.1 of this acceptance criteria.

**3.2 Roof Assembly Fire Classification:** The panels shall be fire tested as a component of a roof assembly. The test methods are noted in Section 4.2 of this acceptance criteria.

Compliance with the requirements of Section 4.2 is not required for installation with nonclassified roof coverings (IBC Table 1505.1 footnote b, and Section 1505.5, and IRC Section R902.1).

**3.3 Surface-burning Characteristics:** The panels shall be tested for surface-burning characteristics. The test methods are noted in Section 4.3 of this acceptance criteria.

**3.4 Weather Resistance:** The panels shall be tested for water vapor transmission, water penetration, wind-driven rain, and accelerated weathering. The test methods are noted in Section 4.4 of this acceptance criteria.

**3.5 Seam Seal Adhesion:** The proprietary seam seal used at board joints, hips, valleys and ridges shall be tested for peel adhesion in accordance with ASTM D 3330/D 3330M.

**4.0 TEST METHODS**

**4.1 Structural:**

**4.1.1 Load Span Capacity:** The wood structural panel roof sheathing, laminated with an alternative roof underlayment, shall comply with the structural performance requirements of PS 2-92 or AC182. Panels shall qualify for a span rating by classification as mat-formed panels as defined in PS 2-92.

**Conditions of Acceptance:** The panels shall show no loss in structural capacity.

**4.1.2 Wind Uplift Resistance:**

**4.1.2.1** The panels, when not fastened in accordance with the applicable code, shall be tested in accordance with either UL 580, ASTM E 330 or UL 580 as modified by TAS 125. The panels shall be installed using the proprietary seam seal at panel joints. The roof assembly shall be described in detail in the test report, including rafter size, type, species of wood and spacing. Fasteners shall be described by size, type and spacing. The assembly shall be tested to failure.

**Conditions of Acceptance:** The allowable uplift load shall be the failure load divided by a safety factor of 2.5. The assembly tested shall be described in the evaluation report.

**4.1.2.2** As an alternate to the wind uplift testing, allowable uplift resistance shall be determined for the roof sheathing in accordance with Sections 1609 and 2304.7.2 of the IBC and Section R301.2.1 of the IRC, when the panels are fastened in accordance with the applicable code.

**4.2 Roof Assembly Fire Classification:**

**4.2.1 General:** The wood structural panel roof sheathing laminated with an alternative roof underlayment shall be tested in accordance with ASTM E 108 or UL 790. The panels shall be installed using the proprietary seam seal at panel joints.

**4.2.2 Asphalt Fiberglass Shingles:** The accredited test laboratory shall select and test a minimum of two roof assemblies using two brands of Class A asphalt fiberglass shingles complying with ASTM D 3018, and which represent the lower range with respect to finish weight specifications. The testing shall be used to document recognition of the panels as an alternative roof sheathing and underlayment in a classified roof covering assembly, when the asphalt fiberglass shingles have the minimum specifications determined by the testing.

**4.2.3 Other Roof Coverings:** Roof assembly classifications for other code-complying roof coverings shall be determined by testing roof covering materials that represent the lower range with respect to physical or mechanical properties deemed relevant by the accredited test laboratory and approved by ICC-ES staff. The test plan must be submitted to ICC-ES staff for approval prior to testing.

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**Conditions of Acceptance:** The assemblies tested shall comply with Section 12, Conditions of Classification, of ASTM E 108, or Section 12, Conditions of Acceptance, of UL 790. The assemblies shall be described in the evaluation report.

**4.3 Surface-burning Characteristics:** The panels shall be tested in accordance with ASTM E 84. The panels shall be installed using the proprietary seam seal at panel joints. The alternative roof underlayment material shall be exposed to the interior of the tunnel.

**Conditions of Acceptance:** The system shall demonstrate a flame-spread index (FSI) not greater than 200, and the smoke-developed index (SDI) shall not be restricted.

### 4.4 Weather Resistance:

**4.4.1 Water Vapor Transmission (WVT) Rate:** The panels shall be tested in accordance with ASTM E 96. Comparative testing shall be performed on code-complying underlayment materials (IBC Section 1507.2.3).

**Conditions of Acceptance:** The WVT rate for the product and the code-complying underlayment materials shall be reported in the test report. The test report shall include conclusions that state that the wood structural panel roof sheathing laminated with an alternative roof underlayment performs in a way that is equal to or better than the performance of the code-complying underlayment material.

**4.4.2 Water Penetration:** The wood structural panel roof sheathing laminated with an alternative roof underlayment shall be tested in accordance with either ASTM E 331 or TAS 202. The test sample shall be installed using the proprietary seam seal at panel joints and shall be mounted on a slope of 2:12.

**Conditions of Acceptance:** No water infiltration shall occur on the underside of the test assembly.

### 4.4.3 Wind-driven Rain:

**4.4.3.1 General:** The panels shall be tested in accordance with TAS 100. The test sample shall be installed using the proprietary seam seal at panel joints and shall be mounted on a slope of 2:12. Testing shall be performed on one deck without roof coverings installed and with a minimum of one deck installed using Class A asphalt fiberglass shingles complying with the code. Other code-complying roof coverings may be used for additional testing and listing in the evaluation report.

**4.4.3.2 Asphalt Fiberglass Shingles:** The accredited test laboratory shall select and test a minimum of two assemblies using two brands of Class A asphalt fiberglass shingles complying with ASTM D 3018, and which represent the lower range with respect to finish weight specifications.

**4.4.3.3 Other Roof Coverings:** Roof assembly classifications for other code-complying roof covering shall be determined by testing roof coverings materials that represent the lower range with respect to physical or mechanical properties deemed relevant by the accredited test laboratory and approved by ICC-ES staff. The test plan must be submitted to ICC-ES staff for approval prior to the testing.

**Conditions of Acceptance:** No water shall infiltrate through the sheathing during the testing.

**4.4.4 Accelerated Weathering:** A minimum of five samples of the panels shall be tested with the proprietary seam seal at panel joints, for a minimum of 30 days of exposure in accordance with ASTM G 152, G 155, or G 154. Weathered panel samples and a minimum of five control samples of the same thickness shall be subjected to flexural loading in accordance with ASTM D 790.

**Conditions of Acceptance:** The average flexural strength of the weathered samples shall be at least 90 percent that of the lowest value for control samples tested with a 90 percent confidence interval of the control samples tested.

**4.5 Seam Seal Adhesion:** Five proprietary seam seal specimens shall be tested for peel adhesion in accordance with ASTM D 3330/D3330M, Method F (90 degree peel), after one hour dwell time.

**Conditions of Acceptance:** The average force required to effect peel of the seal seam adhesion samples shall be greater than 1 pound per linear inch [(16 oz/in) (1.75 N/10 mm)].

## 5.0 QUALITY CONTROL

**5.1** The products, panel and proprietary seam seal material shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service (IAS) or 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

The following shall be included in the evaluation report for wood structural panel roof sheathing factory-laminated with an alternative roof underlayment, covered by this acceptance criteria:

**6.1** In jurisdictions enforcing the IBC, the roof covering system incorporating the panels must be limited to installations in the following construction types:

- Type III-B and Type V-B
- Type III-A or Type V-A under the conditions specified in footnote e of IBC Table 601
- For occupancies other than Group F-1, H, M and S-1, Type III-A or Type V-A under the conditions specified in footnote c of IBC Table 601

In jurisdictions enforcing the IRC, the roof covering system incorporating the panels may be installed on structures constructed in accordance with the IRC.

**6.2** The wind uplift assembly as tested in Section 4.1.2 shall be described in the evaluation report with the allowable wind uplift load.

**6.3** The assemblies complying with Section 4.2 shall be described in the evaluation report with the roof fire classification of either Class A, B or C, and the code-complying roof underlayment shall not be required.

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Assemblies not complying with Section 4.2 shall be limited to installation with nonclassified roof coverings (IBC Table 1505.1 footnote b, IBC Section 1505.5 and IRC Section R902.1) and the code-complying roof underlayment shall not be required.

**6.4** Enclosed attics and rafter spaces must be ventilated in accordance with the applicable code, except where conditioned attic assemblies are permitted in IRC Section 806.4.

**6.5** The panels have not been evaluated for use as an ice dam membrane (Section 1507.2.8.2 of the IBC).

**6.6** The roof coverings qualified in accordance with Sections 4.2 and 4.4.3 of this criteria shall be identified in the evaluation report by manufacturer name, product trade name and minimum product specifications.

**Exception:** Classified roof coverings qualified by testing by an accredited testing agency in accordance with Sections 4.2.2 , 4.2.3, 4.4.3.2 and 4.4.3.3 shall be identified in the evaluation report by the minimum specifications of the material used in the testing, and the roof covering material shall be listed with the same accredited agency. ■