

IAPMO ES

# Cover Sheet

Evaluation Criteria of

**Wood Structural Panels With Factory-Applied Fire Retardant Coatings  
EC 005-200X**

Posted for public commenting on 10/26/2009 to 11/20/2009

**INTERNATIONAL ASSOCIATION OF PLUMBING  
AND MECHANICAL OFFICIALS, EVALUATION SERVICES**

**EVALUATION CRITERIA  
FOR**

**WOOD STRUCTURAL PANELS WITH  
FACTORY-APPLIED FIRE RETARDANT COATINGS**

**EC 005-200X**

**1.0 INTRODUCTION**

- 1.1 Purpose:** This criteria establishes the requirements for recognition by IAPMO Evaluation Service (IAPMO-ES) of wood structural panels with a factory-applied fire-retardant coating (Manufactured Product) under the 2006 *International Building Code*<sup>®</sup> (IBC) Section 104.11 and the 2006 *International Residential Code*<sup>®</sup> (IRC) Section R104.11. Applicable code criteria are listed in Section 1.2.

This criteria prescribes the evaluation of the Manufactured Product for the uses described in Section 1.2, as the IBC, IRC and associated documents do not specify testing methodology and acceptance conditions for such products.

- 1.2 Scope:** The Manufactured Product is used as roof sheathing, wall sheathing, an interior finish, a thermal barrier or a component of a vertical fire-resistance-rated assembly.
- 1.2.1** As roof sheathing on buildings of Type III, IV and V construction for a distance of 4 feet (1200 mm) on both sides of a fire wall to provide continuity of fire wall [IBC Section 705.6, Exception 4.3, IRC Section R317.2.2 (2) Exception].
- 1.2.2** As roof sheathing on building of Type I construction when the vertical distance from the upper floor to the roof is greater than 20 feet (6096 mm) in structures exceeding two stories in height and Type II constructions, as described in IBC Section 603.1 (1.3).
- 1.2.3** As exterior walls on buildings of Type I and II construction, as described in IBC Section 603.1 (1.2).
- 1.2.4** As a Class A interior finish material for walls and ceilings of Type V construction (IBC Section 803 and IRC Section R702 & R315).
- 1.2.5** As a thermal barrier for separating foam plastic insulation in walls from the interior of a building (IBC Section 2603.4 & IRC Section R314.1.2).
- 1.2.6** As a component of fire-resistant rated construction (IBC Section 703).
- 1.2.7** As a component of roof covering classified assemblies (IBC Section 1505).

## 2.0 REFERENCE STANDARDS

- 2.1 Standards referenced in this criteria shall be applied consistently with the specific code(s) complied.

2006 IBC	<i>International Building Code</i> <sup>®</sup>
2006 IRC	<i>International Residential Code</i> <sup>®</sup>
ASTM E84-04	Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E108-04	Standard Test Methods for Fire Tests of Roof Coverings
ASTM E 119-00a	Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM D 968-05 <sup>ε01</sup>	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 3359-08	Standard Test Methods for Measuring Adhesion by Tape Test
ASTM D 5516-03	Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures.
ASTM D 6305-02 <sup>ε01</sup>	Practice for Calculating Bending Strength Design Adjustment Factors for Fire-retardant-treated Plywood Roof Sheathing
AWPA E12-08	Standard Method of Determining Corrosion of Metal in Contact with Treated Wood
NFPA 275	Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation, 2009 edition
UL 790-98 (2006 IBC)	Standard Test for Fire Resistance of Roof Covering Materials-with Revisions through July 1998, Underwriters Laboratories, Inc.
UL 790-04 (2006 IRC)	Standard Test for Fire Resistance of Roof Covering Materials, Underwriters Laboratories, Inc.
UL 1715-97	Fire Test of Interior Finish Material-with Revisions through March 2004

## 3.0 DEFINITIONS

- 3.1 **Wood Structural Panel with a Factory-applied Fire-retardant Coating (Manufactured Product):** A wood based structural panel complying with Section 2303.1.4 of the IBC or Section R604 of the IRC with a proprietary, inert, intumescent coating bonded to one side or both sides with a minimum wet-film thickness of 6 mils as defined in the quality documentation.

## 4. BASIC INFORMATION

- 4.1 **General:** Each submittal shall include the following information for an evaluation report:

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- 4.1.1 Description:** The Manufactured Product shall be described by dimensions, material specifications and compliance with applicable standards or evaluation criteria or acceptance criteria.
- 4.1.2 Installation Instructions:** Installation details and limitations, approved fastener materials, and installation manual.
- 4.1.3 Identification:** Description of the method of identification of the Manufactured Product. Each panel shall bear a mark which clearly identifies the manufacturer or a registered trademark. Packaging shall include the IAPMO evaluation service report number.
- 4.1.3.1** The mark shall be in accordance with Section 2303.2.1 of the IBC and shall include the following additional information:
1. IAPMO-ES evaluation report number
  2. ASTM E84 test indices (flame-spread and smoke developed), and a statement indicating no evidence of significant progressive combustion when the test is extended to 30 minutes
  3. Span rating of the Manufactured Product, grade, and mill identification of the base panel
  4. Name of the accredited inspection agency
- 4.2 Testing Laboratories:** Testing laboratories shall be recognized by IAPMO-Evaluation Services.

## 5.0 TESTING AND PERFORMANCE REQUIREMENTS

- 5.1 Surface-burning Characteristics:** Documentation of the performance of the Manufactured Product to be in compliance with Section 2303.2 of the IBC or Section R604 of the IRC using test method(s) in Section 6.1 of this evaluation criteria.
- 5.2 Durability**
- 5.2.1 Structural Flexural Performance When Exposed to Elevated Temperatures and Humidity:** Documentation of the Manufactured Product as exposed to elevated temperatures and humidity to be in compliance with Section 6.2.1 of this evaluation criteria.
- 5.2.2 Material Degradation:** Documentation of the Manufactured Product tests to be in compliance with Sections 6.2.2 and 6.2.3 of this evaluation criteria.
- 5.3 Fire Classified Roof Covering Assemblies:** Documentation of Manufactured Product when used in a fire classified roof covering assembly, the panels shall be fire tested to be in compliance with Section 6.3 of this evaluation criteria.
- 5.4 Thermal Barrier:** Documentation of the Manufactured Product tested to be in compliance with Section 6.4 of this acceptance criteria.

- 5.5 Fire-resistance-rated Assemblies:** Documentation of Manufactured Product when used in a fire-resistance-rated assembly, the panels shall be fire tested to be in compliance with Section 6.5 of this evaluation criteria.
- 5.6 Substrates:** Documentation of the wood structural panels used in the Manufactured Product to be in compliance with Section 2303.1.4 of the IBC or Section R604 of the IRC.

## 6. TEST METHODS

- 6.1 Surface-burning Characteristics:** Document the surface-burning characteristics of the Manufactured Product according to ASTM E84 test protocol. Construct test samples with a joint running the length of the tunnel. Fasteners are to be driven through the panels from the side opposite the coating with the nail points protruding through the coating and exposed in the tunnel. Hot dipped galvanized roofing nails spaced a minimum of 8 inches (203 mm) on center along the length of the tunnel with one row of nails on each side of the joint shall fasten the test sample to the test assembly. Each type of wood structural panel (OSB or plywood) for which recognition is sought shall have its own surface burning testing that shall apply to all products of that respective type. Each test assembly shall continue for 30-minutes. Document installation details and species/type combination in the test report.
- 6.1.1** For attic exposure evaluation, samples shall be conditioned for a minimum of 42 days to a constant temperature of 140°F ± 5°F (60°C ± 2°C) and a relative humidity of 70% ± 5% prior to surface-burning testing using above installation details and procedures. Only one type of wood structural panel such as OSB shall be required for this attic exposure testing and applies to other types .

**Conditions of Acceptance:** The Manufactured Product shall not have a flame-spread index exceeding 25 and the smoke-developed rating not exceeding 450. T-Flame front progress not more than 10.5 feet (3200 mm) beyond the centerline of the burners when the test is extended for a 30-minute total duration complies with the requirement of significant progressive combustion.

## 6.2 Durability

- 6.2.1 Structural Flexural Performance When Exposed to Elevated Temperatures and Humidity:** Test specimens with and without the factory applied fire-retardant coating for flexural properties after exposure to elevated temperatures and humidity in accordance with procedures of ASTM D 5516.

**Conditions of Evaluation:** Design values of the coated samples exposed to elevated temperatures and humidity shall be comparable to those of the control samples determined by ASTM D6305 procedures. At the end of the test at least 90% of the surface area of the coating must remain adhered. Submit an engineering analysis evaluating the test data.

- 6.2.2 Adhesion Testing:** Document adhesion in accordance with Method A of ASTM D 3359.

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**Conditions of Evaluation:** A classification of 3A or better shall be obtained.

- 6.2.3 Abrasion Testing:** Document abrasion resistance in accordance with ASTM D 968, Method A.

**Conditions of Evaluation:** The minimum mean abrasion resistance shall be 2.5 liters of sand per mil of dry coating thickness.

- 6.3 Fire Classified Roof Covering Assembly:** Test the Manufactured Product as a fire classified roof covering assembly using ASTM E108 (UL 790) on each type of wood structural panel for which recognition is sought. The test assembly report shall completely describe the orientation of the coating along with the corresponding fire classification (Class A, B or C). Code compliant roof coverings and the test laboratory shall deem relevant the lower range of physical or mechanical properties. Two assemblies shall be tested.

**Conditions of Evaluation:** 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 published evaluation report.

- 6.4 Thermal Barrier:** Test the Manufactured Product in accordance with NFPA 275.

**Conditions of Evaluation:** The assemblies tested shall comply with Conditions of Acceptance of NFPA 275.

- 6.5 Fire-Resistance-Rated Assembly:** Test the Manufactured Product as a fire-resistance-rated assembly ASTM E119 on each type of wood structural panel for which recognition is sought. Completely describe the test assembly including the orientation of the coating in the test report.

**Conditions of Evaluation:** A minimum fire-resistance rating of one hour for the wall, floor-ceiling or roof-ceiling assembly shall apply to only the specific assembly tested.

- 6.6 Corrosion Testing:** Test the Manufactured Product in accordance with AWPA E12, with a minimum of 10 replicates per metal.

**Conditions of Evaluation:** Document the types of fasteners, coatings and metals to be specified by the report applicant for each test.

## 7.0 EVALUATION REPORT RECOGNITION

- 7.1** Include the manufacturer's name and address and the evaluation report number as required by IAPMO on the product identification label. The product identification label shall be visible on the product.
- 7.2** The panels' structural design shall be in accordance with the *International Building Code*<sup>®</sup> (IBC) or the *International Residential Code*<sup>®</sup> (IRC).

- 7.3 Avoid exposure to precipitation during storage or installation. If material does become wet, it shall be replaced or permitted to dry (maximum 15 percent moisture content) prior to covering or enclosure within the structure.
- 7.4 Field-repaired panels and for panels exposed to conditions described in Section 7.3 of this criteria require special inspection.

**Adopted: Month &Year**