ICC EVALUATION SERVICE

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February 9, 2010

**TO:** **PARTIES INTERESTED IN EVALUATION REPORTS ON FIRE-RETARDANT-TREATED WOOD**

**SUBJECT:** Revisions to the Acceptance Criteria for Fire-retardant-treated Wood, Subject AC66-0210-R1 (MO/SF)

Dear Madam or Sir:

Enclosed is a copy of the subject revised acceptance criteria approved by the ICC-ES Evaluation Committee on February 2, 2010, effective March 1, 2010.

The criteria was revised to add references to the 2009 IBC and IRC, add definitions for fire-retardant-treated wood, update editions of referenced standards and allow for testing of proprietary corrosion-resistant fasteners in accordance with AC257.

Staff requested input from manufacturers and testing agencies concerning Section 5.0 (Quality Control) of the criteria. Staff received comments and will use the comments to prepare revisions to AC66 Section 5.0 for consideration by the committee at a future meeting.

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 Evaluation reports based on a superseded version of an acceptance criteria must be brought into compliance with the most recent edition at the time the reports are reissued.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, at (800) 423-6587, extension 5685. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

Gary G. Nichols

Gary G. Nichols, PE, SECB
Vice President

GGN/raf

Enclosure

cc: Evaluation Committee

ICC EVALUATION SERVICE

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# ACCEPTANCE CRITERIA FOR FIRE-RETARDANT-TREATED WOOD

**AC66**

**Approved February 2010**

**Effective March 1, 2010**

**Previously approved February 2007, February 2006, October 2005, January 2002, April 1997, September 1991**

## 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 (**I**) 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.***

# ACCEPTANCE CRITERIA FOR FIRE-RETARDANT-TREATED WOOD (AC66)

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this criteria is to establish requirements for fire-retardant-treated (FRT) wood, including lumber and plywood, to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2009 and 2006 *International Building Code*® (IBC), the 2009 and 2006 *International Residential Code*® (IRC), the BOCA® *National Building Code*/1999 (BNBC), the 1999 *Standard Building Code*© (SBC), and the 1997 *Uniform Building Code*™ (UBC). The bases of recognition are IBC Section 104.11, IRC Section R104.11, BNBC Section 106.4, SBC Section 103.7 and UBC Section 104.2.8. Applicable code sections for fire-retardant-treated wood are Section 2303.2 of the 2009 and 2006 IBC, Section R802.1.3 of the 2009 and 2006 IRC, Section 2310.0 of the BNBC, Sections 202 and 2301.8 of the SBC and Sections 207, 2304.5 and 2316.2 (Item 8, amendments to NDS Section 2.3.6) of the UBC. Applicable code sections for fasteners in fire-retardant-treated wood are Section 2304.9.5 of the 2009 and 2006 IBC, Section R 317.3 of the 2009 IRC and Section R319.3 of the 2006 IRC, Section 2306.3 of the SBC, Section 2311.3.3 of the BNBC and Section 2304.3 of the UBC.

The reason for the development of this criteria is to provide a guideline for evaluation of proprietary fire-retardant-treated (FRT) wood products for physical and mechanical properties, quality control procedures and for corrosion of metals in contact with the FRTW, since these items are not covered in Section 2303.2 of the IBC and Section R802.1.3 of the IRC.

**1.2 Scope:** The criteria addresses the fire performance, strength reduction characteristics, hygroscopic properties, durability and corrosion-of-metals properties of fire-retardant-treated (FRT) lumber and plywood.

### 1.3 Codes and Referenced Standards:

#### 1.3.1 Codes:

**1.3.1.1.** 2009 *International Building Code*® (2009 IBC), International Code Council.

**1.3.1.2.** 2006 *International Building Code*® (2006 IBC), International Code Council.

**1.3.1.3.** 2009 *International Residential Code*® (2009 IBC), International Code Council.

**1.3.1.4.** 2006 *International Residential Code*® (2006 IRC), International Code Council.

**1.3.1.5.** BOCA® *National Building Code*/1999 (BNBC).

**1.3.1.6.** 1999 *Standard Building Code*© (SBC).

**1.3.1.7.** 1997 *Uniform Building Code*™ (UBC).

#### 1.3.2 ASTM International Standards:

**1.3.2.1.** ASTM D 2898 [-94 (1999) for the 2006 IBC, -04 for the 2009 IBC], Standard Test Methods for Accelerated Weathering of Fire-retardant-treated Wood for Fire Testing.

**1.3.2.2.** ASTM D 3201-[-94 (2003) 2006 IBC, -07 2009 IBC], Standard Test Method for Hygroscopic Properties of Fire-retardant Wood and Wood-base Products.

**1.3.2.3.** ASTM D 5516-03, Standard Test Method for Evaluating the Flexural Properties of Fire-retardant Treated Softwood Plywood Exposed to Elevated Temperatures.

**1.3.2.4.** ASTM D 5664-02, Standard Test Method for Evaluating the Effects of Fire-retardant Treatments and Elevated Temperatures on Strength Properties of Fire-retardant Treated Lumber.

**1.3.2.5.** ASTM D 6305-02e01, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-retardant-treated Plywood Roof Sheathing.

**1.3.2.6.** ASTM D 6841-03, Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber.

**1.3.2.7.** ASTM E 69-02, Standard Test Method for Combustible Properties of Treated Wood by the Fire-Tube Apparatus.

**1.3.2.8.** ASTM E 84-[-04 (2006 IBC), -07 (2009 IBC)], Standard Test Method for Surface Burning Characteristics of Building Materials.

**1.3.3** NDS-05, National Design Specification (NDS) for Wood Construction, with 2005 Supplement, American Forest & Paper Association.

**1.3.4** AWPA E12-08©, Standard Method of Determining Corrosion of Metals in Contact with Treated Wood, American Wood-Preservers' Association.

**1.3.5** Military Specification, Lumber and Plywood, Fire-Retardant Treated, MIL-L-19140E, dated 28 June 1984, with Amendment 2, dated January 29, 1997.

**1.3.6** ICC-ES Acceptance Criteria for Proprietary Wood Preservative Systems—Common Requirements for Treatment Process, Test Methods and Performances (AC326)

**1.3.7** ICC-ES Acceptance Criteria for Corrosion-resistant Fasteners and Evaluation of Corrosion Effects of Wood Treatment Chemicals (AC257)

### 1.4 Definitions:

**1.4.1 Fire-retardant-treated wood:** Defined in Section 2303.2 of the 2009 IBC and Section R802.1.3 of the 2009 IRC.

**1.4.2 Pressure process:** Defined in Section 2303.2.1 of the 2009 IBC and Section R802.1.3.1 of the 2009 IRC.

**1.4.3 Other means during manufacture:** Defined in Section 2303.2.2 of the 2009 IBC and Section R802.1.3.2 of the 2009 IRC. Testing shall be in accordance with Section 2303.2.3 of the 2009 IBC and Section R802.1.3.3 of the 2009 IRC.

## 2.0 BASIC INFORMATION

**2.1 General:** The applicant for an evaluation report concerning fire-retardant-treated wood shall submit the following information:

**2.1.1 Product Description:** Information on the fire-retardant treatment chemicals, treating process and treater's manual.

**2.1.2 Installation Instructions:** Product limitations on interior and exterior uses, and fastener materials permitted for use with the fire-retardant-treated wood.

**2.1.3 Packaging and Identification:** Method of packaging and product identification of wood products: All fire-retardant-treated wood shall be identified by legible marking with an ink stamp or label. At least one mark shall be applied to every piece of lumber or plywood, except for lumber with cross-sectional dimensions less than 1 by 2 inches (25.4 by 51 mm), where one mark may be applied to a bundle of not more than 20 board feet (0.37 $m^3$). The marking shall be issued by an IAS-accredited inspection agency having a service for inspection of materials at the factory. The label shall be in accordance with Section 2303.2.1 of the 2006 IBC, or Section 2302.4 of the 2009 IBC and shall include the following additional information:

1. ICC-ES evaluation report number.
2. ASTM E 84 10 minute test indices (flame spread and smoke developed), and statement indicating no evidence of significant progressive combustion when the test is extended to 30 minutes.
3. Name or identification number and location of treater.
4. Month and year of treatment.
5. When testing has been conducted at 80ºF (26.7° C) only (see Sections 4.1.1 and 4.2.1), labels shall state that the products shall not be used in roofing applications.

**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 Test Sampling:** Test samples shall be prepared and/or obtained under the supervision of an accredited inspection agency, and verification shall be provided to the testing agency regarding the authenticity of the samples. The testing agency shall be provided with sample preparation and treating methods, solution analysis, and solution retention.

## 3.0 TESTS AND PERFORMANCE REQUIREMENTS

**3.1 FRT Lumber:** Reports of the following tests shall be submitted:

**3.1.1 Strength and Stiffness Properties:** ASTM D 5664 and Section 2303.2.2 of the 2006 IBC or Section 2303.2.5 of the 2009 IBC. Strength and stiffness properties tests of lumber shall be conducted on all species for which recognition is sought.

**Exception:** The results of tests conducted on southern pine, Douglas fir, and either white spruce or a spruce/fir mixture are permitted to be used together as being representative of all lumber species. A spruce/fir mixture can be obtained by obtaining Canadian spruce-pine-fir and removing the Lodgepole and Jack pine which can be visually segregated from the remaining spruces and firs. Under this exception, the lowest of the property median treatment ratios obtained from the three species in accordance with Section 4.1.1 shall be used with any untested softwood species.

**3.1.2 Hygroscopic Properties:** ASTM D 3201 and Section 2303.2.4 of the 2006 IBC or Section 2303.2.7 of the 2009 IBC. Required for recognition of use in interior applications. The hygroscopic properties of each species of lumber for which recognition is sought shall be determined. The FRT lumber shall be classified in accordance with Section 2303.2.4 of the 2006 IBC, or Section 2303.2.7 of the 2009 IBC.

**3.1.3 Durability:** ASTM D 2898 and Section 2303.2.3 of the 2006 IBC or Section 2303.2.6 of the 2009 IBC. Required for recognition of use in exterior applications.

**3.1.4 Flame-spread Properties:** The flame-spread characteristics for each species of lumber for which recognition is sought shall be determined in accordance with ASTM E 84. For recognition of exterior use, tests shall be conducted both before and after durability tests conducted in accordance with Section 3.1.3. The FRT lumber shall meet the requirements of IBC Section 2303.2, UBC Section 207, SBC Section 202, or BNBC 2310.2, as applicable.

**3.2 FRT Plywood:** Reports of the following tests shall be submitted:

**3.2.1 Flexural Strength and Stiffness Properties:** ASTM D 5516 and Section 2303.2.2 of the 2006 IBC or Section 2303.2.5 of the 2009 IBC. Strength properties tests of plywood shall be conducted on all species for which recognition is sought.

**Exception:** The results of tests conducted on southern pine plywood are permitted to be used as being representative of all plywood species.

**3.2.2 Hygroscopic Properties:** ASTM D 3201 and IBC Section 2303.2.4. Required for recognition of use in interior applications. The hygroscopic properties of each species of plywood for which recognition is sought shall be determined. The FRT plywood shall be classified in accordance with Section 2303.2.4 of the 2006 IBC or Section 2303.2.7 of the 2009 IBC.

**3.2.3 Durability:** ASTM D 2898 and Section 2303.2.3 of the 2006 IBC or Section 2303.2.6 of the 2009 IBC. Required for recognition of use in exterior applications.

**3.2.4 Flame-spread Properties:** The flame-spread characteristics for each species of plywood for which recognition is sought shall be determined in accordance with ASTM E 84. For recognition of exterior use, tests shall be conducted both before and after durability tests conducted in accordance with Section 3.2.3. The FRT plywood shall meet the requirements of IBC Section 2303.2, UBC Section 207, SBC Section 202, or BNBC Section 2310.2, as applicable.

**3.3 Corrosion Testing for Interior Applications:**

**3.3.1** Corrosion testing of metals in contact with fire-retardant-treated lumber and plywood used in interior applications shall be in accordance with MIL-L-19140E (Section 4.6.5.2) or AWPA E 12 as modified in Section 4.6 of AC326. Testing conducted after January 29, 1997, shall be in accordance with the AWPA E12 procedure. Metals that comply with the conditions of acceptance shall be

permitted for use in contact with fire-retardant treated wood used in interior applications.

**Conditions of Acceptance:** The corrosion rate of the metals tested shall not exceed 5 mils (0.13 mm) per year as specified in Section 3.7 of MIL-L-19140E, when testing in accordance with this specification. When testing in accordance with AWPA E12, conditions of acceptance shall be as noted in Section 4.6 of AC326.

**3.3.2** When recommendations are made by the fire-retardant-treated wood manufacturer for use of proprietary corrosion-resistant fasteners in contact with fire-retardant-treated wood, corrosion testing and evaluation of such fasteners shall be in accordance with Section 3.1 of AC257.

## 4.0 ANALYSIS

### 4.1 FRT Lumber:

**4.1.1** The design value treatment adjustment factors for fire-retardant-treated lumber shall be determined in accordance with ASTM D 6841 using results from tests specified in Section 3.1.1, except as limited in Sections 4.1.2 and 4.1.3.

**Exception:** Lumber identified as “Exterior” in accordance with Section 2303.2.3 of the IBC, and not recognized for use in roofing applications, need only be tested at 80°F (26.7°C).

**4.1.2** The adjustment factor for fastener loads for each lumber species shall be the lower of the ratio for maximum stress in compression parallel to grain and the ratio for maximum stress in horizontal shear, determined in accordance with ASTM D 5664, or 0.90, whichever is lower.

**4.1.3** The adjustment factor for compression perpendicular to grain design values shall be 0.95 for both normal and high temperature applications.

### 4.2 FRT Plywood:

**4.2.1** Bending strength design adjustment factors for fire-retardant-treated plywood shall be determined in accordance with ASTM D 6305 using results from tests specified in Section 3.2.1. The initial treatment (IT) effect as determined by ASTM D 6305, shall be used as the reduction factor for plywood not used in roofing applications. The total allowable roof sheathing load (live load plus dead load) shall be determined in accordance with ASTM D 6305 for each species of plywood tested based on the design adjustment factors. Recommended uniform live loads for FRT plywood for roofing and subfloor applications shall be provided.

**Exception:** Plywood identified as “Exterior” in accordance with Section 2303.2.3 of the IBC, and not recognized for use in roofing applications, need only be tested at 80°F (26.7°C).

**4.2.2** For roof slopes less than 3:12, the next panel thickness greater than required for the span shall be specified. Ventilation in accordance with the applicable code is required.

## 5.0 QUALITY CONTROL

**5.1 General:** Fire-retardant-treated lumber and plywood shall be produced at plants with a quality assurance program, with inspections conducted by an approved agency with a recognized program for the inspection of fire-retardant-treated lumber and plywood.

Each plant shall be qualified based on its equipment, its in-house quality control program and evaluation of the qualification charge(s) for lumber and plywood.

Requirements for the quality control of production material shall be based upon the production and testing of the qualification material. These quality control requirements shall include moisture content, solution concentration, chemical retention by gage and fire tube tests, assay of borings, or other validated methods as delineated in the approved quality documentation.

Quality documentation prepared in accordance with the Acceptance Criteria for Quality Documentation (AC10) shall be submitted for initial qualification. The quality documentation shall include information on quality control tests as set forth in this criteria and information on key processing parameters of the treatment process procedures. Such parameters include moisture content prior to treatment, treatment solution strength, solution analysis, method of treatment, amounts of vacuum or pressure used for treatment, minimum chemical retention, chemical penetration, temperature of treatment solution, time period of treatment, waiting or drip period after treatment for air-dried processes, post-treatment moisture content after drying, and fire-tube test results. Checklists used by the quality control agency for monthly inspections shall be included in the quality documentation.

### 5.2 Plant Quality Control:

#### 5.2.1 Program Requirements:

**5.2.1.1.** Each plant is to maintain a quality control program. The plant shall appoint a quality control supervisor who will be responsible for the quality control program and will have the authority to take action as required to ensure compliance of all material produced by the plant. The plant quality control supervisor will serve as the primary contact for the quality control inspection agency.

**5.2.1.2.** The plant shall be equipped with the process equipment, measuring instruments, records, and laboratory equipment necessary to accurately monitor the treating, drying and testing procedures conducted at the plant. The equipment shall be properly calibrated and maintained in good working order, and personnel shall be properly trained in the use thereof.

**5.2.1.3.** The fire-retardant treatment solution shall be controlled so that the solution used for treatment operations is of the same composition, within qualified tolerances, as the solution used for the treatment of qualification-test specimens.

**5.2.2 Treatment Solutions:** A representative sample of the treating solution shall be drawn from the working solution batch, for verification testing by the in-plant quality control inspector, at the start of each day, before treatment; whenever any adjustments are made to the solution; and after every third charge.

The verification test of the working solution shall include a determination of the specific gravity and temperature of the treating solution, and shall be within the

qualified tolerances of the solution used for the treatment of qualification test specimens.

**5.2.3 Treatment Process Control:**

**5.2.3.1. General:** Critical operating parameters for the treatment process shall be continuously monitored by means of automatic chart recorder(s). These critical parameters include, but are not limited to, pressure, vacuum and time. Temperature and other parameters may be deemed critical, depending upon the process used. The limiting tolerances of these critical parameters shall be as noted in the quality documentation.

**5.2.3.2. Treating:** Each treatment load shall be documented as follows: A charge report that describes the species and volume of material treated, the date, the charge number and the treating cycle parameters.

**5.2.3.3. Moisture Content (MC):** The fire-retardant-treated lumber or plywood shall be dried after treatment. Fire-retardant-treated lumber shall be dried to a moisture content of 19 percent or less and fire retardant treated plywood shall be dried to a moisture content of 15 percent or less. The moisture content may be measured using a calibrated moisture meter, oven-dry methods, or a combination of the two. The use of a moisture meter requires demonstration that the values correlate to the oven-dry method and are documented in the quality documentation. During drying, the temperature shall not exceed the maximum temperature used in preparation of the strength test specimens (reference Sections 3.1 and 3.2 or ASTM D 5516 / D 5664).

**5.2.3.4. Kiln Drying:** For kiln-dried processes, a kiln record shall be kept that describes the species, the sizes and volume of material dried, the kiln controller settings (wet bulb and dry bulb temperatures), the time and the final moisture-content readings. A kiln recorder chart, showing actual environmental conditions during the entire drying period, shall be kept with the kiln record.

**5.2.3.5. Air Drying:** For air-drying processes, the ambient environmental conditions, the length of time of air drying, and the final moisture content readings shall be recorded and maintained in a permanent log.

**5.2.3.6. Storage:** All treated wood shall be stored in weather-protected locations or shall be protected by waterproof wrapping. All fire-retardant-treated wood shall be stored off of the ground.

**5.2.3.7. Records:** Permanent records shall be kept for a minimum of two years, to document that all treated materials meet the quality control agency requirements and that in-house quality control procedures have been properly conducted.

**5.2.4 Chemical Verification:** In all cases, chemical verification shall conform to requirements outlined in the approved quality documentation. Verification shall be by means of fire tube tests or an assay of borings by chemical analysis, using nationally recognized test methods or other methods that have been validated to relate to results of fire tests conducted in accordance with Sections 3.1.4 and 3.2.4 of this criteria. Three fire-tube tests (ASTM E 69, Procedure B) shall be conducted on specimens processed with each charge treated. In lieu of the actual species treated, a standard lumber species, such as Douglas fir, may be used for fire tube testing on each charge. The average final percentage weight loss of the treated wood samples, after flaming and glowing have ceased, and the maximum temperature, shall be equal to or less than that obtained on the qualification-test specimens. The final percentage weight loss of any individual specimen shall not exceed the qualification value by more than five percentage points. Alternately, an assay of borings, by chemical analysis, may be used to verify the treatment process. This analysis shall be conducted on a composite of 20 borings per species per charge, on a representative sampling of the treated lumber. The result of this analysis shall substantiate equivalency to the qualification analysis. When the treatment process is verified by methods other than fire tube tests or an assay of borings, the approved quality documentation shall include a description of the verification method and conditions of acceptance.

**5.3** Fire-retardant-treated lumber and plywood shall be produced at plants with a quality assurance program conducted by an approved agency. The quality control agency may be the same organization as the testing laboratory. Different quality control agencies may be used to monitor phases of production associated with different properties. In all cases, the quality control agency shall have current IAS accreditation for inspection of fire-retardant-treated wood.

**5.3.1** The quality control inspection agency shall inspect every plant producing fire-retardant-treated wood at least once a month. More frequent inspection may be necessary for plants operating more than one shift per day, or operating more than five days per week. The visits shall not be made on a regular schedule, but shall be coordinated with the plant quality control supervisor so that materials will be available for testing during the inspection. The inspector shall review plant records recorded since the last inspection to verify that the required records are being maintained in a complete and accurate fashion, and that all treated materials have been properly tested and have complied with the established quality control requirements. While at the plant, the inspector shall witness fire tube tests; take borings for analysis from at least one charge, or verify compliance with other validated methods specified in the approved quality documentation; check the moisture content of material that has been kiln- or air-dried; and check the solution concentration by hydrometer. The inspector shall keep a report of his findings and copies of records of all witnessed tests.

**5.3.2** The quality control inspection agency shall sample the fire-retardant solution from each plant quarterly. The sample shall be obtained from the treating cylinder or storage tank at the time of the inspection. The sample shall be labeled and sent to the inspection agency or designated independent laboratory to confirm proper chemical composition and concentration. Additionally, the agency shall verify plant records of plant testing of the treating solution.

**5.3.3** The agency shall examine production records to ensure proper accounting of production. In this regard, reference is made to Sections 2.1.4 and 2.1.5 of the Acceptance Criteria for Quality Documentation (AC10), which requires that the agency have total control of the identification methods. A system of traceability of finished product to treatment, drying and quality control records must be provided.

**5.3.4** The quality control agency must verify on going compliance with the surface burning characteristics and strength properties.

### 5.4 Resolution of Noncompliance:

**5.4.1** If a plant fails to maintain all required records in a complete and accurate manner, the quality control agency shall give the plant a written warning, including details of the deficiencies. Three consecutive monthly warnings, or four warnings in a six-month period, shall result in suspension of the plant's marking privileges and removal of all stamps and labels from the plant, until such time as the requirements are met to the satisfaction of the quality control agency.

**5.4.2** If the agency discovers nonconformance with the requirements of this criteria, the quality control procedures or the approved quality documentation, the agency shall initiate double-frequency inspections until two consecutive inspections show full conformance. If three consecutive inspections show nonconformance, or if four inspections in a six-month period show nonconformance, the plant's marking privileges shall be suspended and all stamps and labels removed from the plant until such time as all requirements are met to the satisfaction of the quality control agency and ICC-ES.

**5.4.3** When conducting the ASTM E 69 fire tube test on samples from a load of treated lumber, (i.e., the charge) the charge is acceptable if the first three samples tested meet the quality control requirements. If one of the first three samples fails, an additional three samples may be tested. If all of the three additional samples meet the requirements, the charge is acceptable. If the charge is not acceptable, it shall be retreated and retested.

**5.4.4** The solution concentration shall be within the range specified in the quality documentation. If the solution concentration is low, the charge shall be retreated with the proper solution.

**5.4.5** The analysis of solution sampled by the quality control agency shall confirm proper chemical composition and concentration. If nonconforming, appropriate action shall be taken by the plant to adjust the solution. Additional samples shall then be analyzed on a weekly basis until conformance has been demonstrated in two consecutive samples. All lumber and plywood found to have been treated with a nonconforming solution shall be segregated and labeled as nonconforming. A representative sampling of the nonconforming lumber and plywood selected by the quality control agency shall be tested, and shall meet the flame spread and strength requirements of the code before it may be released.

**5.4.6** The charge retention shall be within the specified range of gage retention of fire-retardant chemical, as determined during qualification testing for the applicable material and species. If retention is below the minimum, the charge shall be retreated so that the total retention is within the minimum and maximum qualified values. If retention is above the maximum allowed, the lumber or plywood in the charge shall not be stamped.

## 6.0 EVALUATION REPORT RECOGNITION

The following are conditions of use for fire-retardant-treated wood products covered by this acceptance criteria:

**6.1** All strength calculations shall be subject to the design value adjustment factors or span ratings shown in Tables [insert table numbers] of this report.

**6.2** The design value adjustment factors and span ratings given in this report shall only be used for unincised dimensional lumber and plywood of the species noted in this report.

**6.3** The exposure limitations of the fire-retardant-treated wood shall be defined in the evaluation report, either exterior or interior.

**6.4** The fire-retardant-treated wood shall not be used in contact with the ground.

**Exception:** Fire-retardant-treated wood of naturally durable species which is identified as "Exterior" in accordance with Section 2303.2.3 of the 2006 IBC or Section 2303.2.6 of the 2009 IBC, and which is evaluated for ground-contact use.

**6.5** The fire-retardant-treated lumber shall not be ripped or milled as this will alter the surface-burning characteristics and invalidate the flame-spread classification.

**6.6** Exposure to precipitation during storage or installation shall be avoided. If material does become wet, it shall be replaced or permitted to dry (maximum 19 percent moisture content for lumber and 15 percent moisture content for plywood) prior to covering or enclosure by wallboard or other construction materials (except for protection during construction).

**6.7** The design value adjustment factors and plywood spans in Tables [insert table numbers] of this report are applicable under elevated temperatures resulting from cyclic climatic conditions. They are not applicable under continuous elevated temperatures resulting from manufacturing or other processes which shall require special consideration in design, which is not within the scope of this report. ■