

ACCEPTANCE CRITERIA FOR FIRE-RETARDANT-TREATED WOOD

AC66

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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. (Some reports may also reference older code families such as the BOCA National Codes, the Standard Codes, and the Uniform 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.

This acceptance criteria has been issued to provide interested parties with guidelines for demonstrating compliance with performance features of the codes referenced in the criteria. The criteria was developed through a transparent process involving public hearings of the ICC-ES Evaluation Committee, and/or on-line postings where public comment was solicited.

New acceptance criteria will only have an “approved” date, which is the date the document was approved by the Evaluation Committee. When existing acceptance criteria are revised, the Evaluation Committee will decide whether the revised document should carry only an “approved” date, or an “approved” date combined with a “compliance” date. The compliance date is the date by which relevant evaluation reports must comply with the requirements of the criteria. See the ICC-ES web site for more information on compliance dates.

If this criteria is a revised edition, a solid vertical line (|) in the margin within the criteria indicates a change from the previous edition. A deletion indicator (→) is provided in the margin where any significant wording has been deleted.

ICC-ES may consider alternate criteria for report approval, provided the report applicant submits 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. ICC-ES retains the right to refuse to issue or renew any evaluation report, if the applicable product, material, 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 injury or unreasonable damage.

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1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish requirements for issuance of ICC Evaluation Service, LLC (ICC-ES) evaluation reports on fire-retardant-treated (FRT) wood, including lumber and plywood under the 2021, 2018, 2015 and 2012 *International Building Code*® (IBC) and the 2021, 2018, 2015 and 2012 *International Residential Code*® (IRC). The bases of recognition are IBC Section 104.11 and IRC Section R104.11. Applicable code sections for fire-retardant-treated wood are Section 2303.2 of the 2021, 2018, 2015 and 2012 IBC and Section R802.1.5 of the 2021, 2018 and 2015 IRC and Section R802.1.3 of the 2012 IRC. Applicable code sections for fasteners in fire-retardant-treated wood are Section 2304.10.6 of the 2021 IBC, Section 2304.10.5 of the 2021, 2018 and 2015 IBC, Section 2304.9.5 of the 2012 IBC, and Section R317.3 of the 2021, 2018, 2015 and 2012 IRC.

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, Section R802.1.5 of the 2021, 2018 and 2015 IRC, and Section R802.1.3 of the 2012, 2009, and 2006 IRC.

For compliance with the 2009 and 2006 *International Building Code*® (IBC), 2009 and 2006 *International Residential Code*® (IRC), BOCA® *National Building Code/1999* (NBBC), the 1999 *Standard Building Code*® (SBC), and the 1997 *Uniform Building Code*™ (UBC), refer to a previous version of this criteria, dated June 2015 (available from ICC-ES upon request).

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: Where standards are referenced in this criteria, the standards shall be applied consistent with the requirements of the applied code. Editions of the standards applicable to each code are summarized in Table 1.

1.3.1.1 2021, 2018, 2015 and 2012 *International Building Code*® (IBC), International Code Council.

1.3.1.2 2021, 2018, 2015 and 2012 *International Residential Code*® (IRC), International Code Council.

1.3.2 ASTM International Standards:

1.3.2.1 ASTM D2898, (-10 for the 2018 and 2015 IBC and IRC, -04 for the 2012 and 2009 IBC and IRC, -94 [1999] for the 2006 IBC and IRC) Standard Test Methods for Accelerated Weathering of Fire-retardant-treated Wood for Fire Testing.

1.3.2.2 ASTM D3201, Standard Test Method for Hygroscopic Properties of Fire-retardant Wood and Wood-based Products.

1.3.2.3 ASTM D5516, Standard Test Method for Evaluating the Flexural Properties of Fire-retardant Treated Softwood Plywood Exposed to Elevated Temperatures.

1.3.2.4 ASTM D5664, 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 D6305, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-retardant-treated Plywood Roof Sheathing.

1.3.2.6 ASTM D6841, Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber.

1.3.2.7 ASTM E69, Standard Test Method for Combustible Properties of Treated Wood by the Fire-Tube Apparatus.

1.3.2.8 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3.2.9 ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3.3 UL Standards:

1.3.3.1 UL 263, Standard for Fire Tests of Building Construction and Materials.

1.3.3.2 UL 723, Standard Test for Surface Burning Characteristics of Building Materials.

1.3.4 ANSI/AWC *National Design Specification*® for Wood Construction (NDS), and *Supplement* (2018 for the 2021 and 2018 IBC and IRC, 2015 for the 2015 IBC and IRC, 2012 for the 2012 IBC and IRC, 2005 for the 2009 and 2006 IBC and IRC), American Wood Council.

1.3.5 AWWA E12-15®, Standard Method of Determining Corrosion of Metals in Contact with Treated Wood, American Wood-Preservers' Association.

1.3.6 ICC-ES Acceptance Criteria for Proprietary Wood Preservative Systems—Common Requirements for Treatment Process, Test Methods and Performance (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: As defined in Section 2303.2 of the IBC and Section R802.1.5 of the 2021, 2018 and 2015 IRC or Section R802.1.3 of the 2012 IRC FRTW are wood products impregnated with chemicals by a pressure process or other means.

1.4.2 Pressure Process: Defined in Section 2303.2.1 of the IBC and Section R802.1.5.1 of the 2021, 2018 and 2015 IRC or Section R802.1.3.1 of the 2012 IRC.

1.4.3 Other Means During Manufacture: Defined in Section 2303.2.2 of the IBC and Section R802.1.5.2 of the 2021, 2018 and 2015 IRC or Section R802.1.3.2 of the 2012 IRC. Testing shall be in accordance with Section 2303.2.3 of the IBC and Section R802.1.5.3 of the 2021, 2018 and 2015 IRC or Section R802.1.3.3 of the 2012 IRC. Other means during manufacture must be preapproved by ICC-ES prior to testing.

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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: an ink stamp marking shall identify all fire-retardant-treated wood. The ink stamp shall be a legible marking. 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 m³). The marking shall be issued by a properly accredited inspection agency having a contractual relationship with ICC-ES. The method of product marking for traceability of the finished product in accordance with Section 2.1.5 of AC10 must be documented in the quality documentation.

The marking shall be in accordance with the product identification provisions of the ICC-ES Rules of Procedure for Evaluation Reports and Section 2303.2.4 of the 2021, 2018, 2015 and 2012 IBC or Section R802.1.5.4 of the 2021, 2018 and 2015 IRC or Section R802.1.3.4 of the 2012 IRC, and shall include the following additional information:

1. ASTM E84 or UL 723 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.

2. Name or identification number and location of treater.

3. When testing has been conducted at 80°F (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 the 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.

2.5 Qualification Test Plan: A qualification test plan shall be submitted to and approved by ICC-ES staff prior to any testing being conducted.

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 D5664 and Section 2303.2.5 of the IBC, or Section R802.1.5.5 of the 2021, 2018 and 2015 IRC, or Section R802.1.3.5 of the 2012 IRC. Strength and stiffness properties tests of lumber shall be conducted on all species for which evaluation 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 D3201 and Section 2303.2.7 of the IBC, or Section R802.1.5.9 of the 2021, 2018 and 2015 IRC or Section R802.1.3.7 of the 2012 IRC. Required for use in interior applications. The hygroscopic properties of each species of lumber for which to be included in the evaluation report shall be determined. The FRT lumber shall be classified in accordance with Section 2303.2.7 of the IBC, or Section R802.1.5.9 of the 2021, 2018 and 2015 IRC or Section R802.1.3.7 of the 2012 IRC.

3.1.3 Durability: ASTM D2898 and Section 2303.2.6 of the IBC or Section R802.1.5.8 of the 2021, 2018 and 2015 IRC or Section R802.1.3.6 of the 2012 IRC. Required for recognition of use in exterior applications.

3.1.4 Surface Burning Characteristics The surface burning characteristics (flame spread and smoke-developed index) shall be determined in accordance with ASTM E 84 or UL 723. The flame spread index shall be 25 or less and there shall be no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 10½ feet (3200 mm) beyond the centerline of the burners at any time during the test. The smoke-developed index shall be 450 or less. 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 Section 2303.2 of the IBC, or Section R802.1.5 of the 2021, 2018 and 2015 IRC, or Section R802.1.3 of the 2012 IRC, as applicable.

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

3.2.1 Flexural Strength and Stiffness Properties: ASTM D5516 and Section 2303.2.5 of the IBC, or Section R802.1.5.5 of the 2021, 2018 and 2015 IRC, or Section R802.1.3.5 of the 2012 IRC. Strength properties tests of plywood shall be conducted on all species to be included in the evaluation report.

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 D3201 and Section 2303.2.7 of the IBC or Section R802.1.5.9 of the 2021, 2018 and 2015 IRC or Section R802.1.3.7 of the 2012 IRC. Required for recognition of use in interior applications. The hygroscopic properties of each species of plywood for

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which to be included in the evaluation report shall be determined. The FRT plywood shall be classified in accordance with Section 2303.2.7 of the IBC or Section R802.1.5.9 of the 2021, 2018 and 2015 IRC or Section R802.1.3.7 of the 2012 IRC.

3.2.3 Durability: ASTM D2898 and Section 2303.2.6 of the IBC or Section R802.1.5.8 of the 2021, 2018 and 2015 IRC or Section R802.1.3.6 of the 2012 IRC. Required for evaluation of use in exterior applications.

3.2.4 Surface Burning Characteristics The surface burning characteristics (flame spread and smoke-developed index) shall be determined in accordance with ASTM E 84 or UL 723 and 2021 IBC Section 2303.2.3. The flame spread index shall be 25 or less and there shall be no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 10½ feet (3200 mm) beyond the centerline of the burners at any time during the test. The smoke-developed index shall be 450 or less. 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 Section 2303.2 of the IBC or Section R802.1.5.3 of the 2021, 2018 and 2015 IRC, or Section R802.1.3 of the 2012 IRC, 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 AWPA E12 as modified in Section 4.6 of AC326. 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: 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.

3.4 Fire-resistance-rated Assemblies (Optional): When FRT lumber and plywood are used as components of a fire-resistance-rated wall, floor-ceiling, or roof-ceiling assembly, the assembly shall be tested in accordance with ASTM E119 or UL 263. The fire-resistance-rated assembly shall be completely described in the test report specifying the hourly fire-resistance rating.

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 D6841 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 2303.2.6 of the IBC, or Section R802.1.5.7 of the 2021, 2018 and 2015 IRC, or Section R802.1.3.5.2 of the 2012 IRC, and not evaluated 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 D5664, 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 D6305 using results from tests specified in Section 3.2.1. The initial treatment (IT) effect as determined by ASTM D6305, 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 D6305 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 2303.2.6 of the IBC, or Section R802.1.5.7 of the 2021, 2018 and 2015 IRC, or Section R802.1.3.5.2 of the 2012 IRC, and not evaluated 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.

4.3 FRT Plywood Shear Walls (Optional): Use of FRT plywood as a component of a shear wall shall be documented by either a structural analysis or full-scale load testing. Shear wall assemblies and any allowable load adjustments shall be included in the final evaluation report.

The structural analysis shall be prepared by an independent third party. Prior to full-scale load testing, a test plan shall be submitted to ICC-ES staff for approval.

5.0 QUALITY CONTROL

5.1 General: Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted for each facility manufacturing or labeling products that are to be evaluated in the ICC-ES evaluation report.

5.2 Products shall be manufactured under an approved quality control program with inspections by ICC-ES or a properly accredited inspection agency having a contractual relationship with ICC-ES.

5.3 A qualifying inspection shall be conducted at each manufacturing facility in accordance with the requirements of the ICC-ES Acceptance Criteria for Inspections and Inspection Agencies (AC304).

5.4 Fire-retardant-treated lumber and plywood shall be produced at plants with a quality assurance program, with inspections conducted by ICC-ES or an approved agency with a recognized program for the inspection of fire-retardant-treated lumber and plywood having a contractual relationship with ICC-ES.

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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.

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 inspection agency for monthly inspections shall be included in the quality documentation.

5.5 Plant Quality Control:

5.5.1 Program Requirements:

5.5.1.1 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.

5.5.1.2 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.

5.5.1.3 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.

5.5.2 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.

5.5.3 Treatment Process Control:

5.5.3.1 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.

5.5.3.2 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.

5.5.3.3 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 D5516 / D5664).

5.5.3.4 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.

5.5.3.5 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.

5.5.3.6 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.

5.5.3.7 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.

5.5.4 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

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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.

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

5.6.1 The inspection agency shall inspect every plant producing fire-retardant-treated lumber and plywood, 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.

5.6.2 The 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.

5.6.3 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 require 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.

5.6.4 The inspection agency must verify ongoing compliance with the surface burning characteristics and strength properties.

5.7 Resolution of Noncompliance:

5.7.1 If a plant fails to maintain all required records in a complete and accurate manner, the inspection 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.

5.7.2 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 inspection agency and ICC-ES.

5.7.3 When conducting the ASTM E69 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.

5.7.4 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.

5.7.5 The analysis of solution sampled by the inspection 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 inspection agency shall be tested, and shall meet the flame spread and strength requirements of the code before it may be released.

5.7.6 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

5.7.7 above the maximum allowed, the lumber or plywood in the charge shall not be stamped.

6.0 EVALUATION REPORT

The result of a successful evaluation of products under this acceptance criteria shall be an evaluation report issued by ICC-ES. 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.

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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 2303.2.6 of the IBC, or Section R802.1.5.8 of the 2021, 2018 and 2015 IRC or Section R802.1.3.6 of the 2012, 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 for lumber 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.

6.8 Fire-resistance-rated assemblies qualified in accordance with Section 3.4 of this criteria must be described in the evaluation report. ■

TABLE 1 – CROSS REFERENCE OF EDITIONS OF STANDARDS

STANDARD	2021 IBC/IRC	2018 IBC/IRC	2015 IBC/IRC	2012 IBC/IRC	2009 IBC/IRC	2006 IBC/IRC
ASTM D2898	-10 (2017)	-10		-04		-94 (1999)
ASTM D3201		-13		-08a	-07	-94 (2003)
ASTM D5516	-18	-09			-03	
ASTM D5664	-17	-09			-03	
ASTM D6305	-08 (2015 e1)		-08			2002 e01
ASTM D6841	-16		-08			-03
ASTM E69			-02 (2007)			
ASTM E84	2018b ¹	-16	-12a	-08a	-07	-00
ASTM E119	2018b	-16	-12a	-08a	-07	-00
UL 263	-11	-11		-03		-
UL 723 ¹	2018		-08			-03

¹For evaluation in of wood structural panels test specimens must be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm) in accordance with 2021 IBC Section 2303.2.3.