NFPA 703

Standard for

Fire Retardant–Treated Wood and Fire-Retardant Coatings

for Building Materials

2006 Edition

This edition of NFPA 703, *Standard for Fire Retardant–Treated Wood and Fire-Retardant Coatings for Building Materials*, was prepared by the Technical Committee on Materials and acted on by NFPA at its June Association Technical Meeting held June 6–10, 2005, in Las Vegas, NV. It was issued by the Standards Council on July 29, 2005, with an effective date of August 18, 2005, and supersedes all previous editions.

This edition of NFPA 703 was approved as an American National Standard on August 18, 2005.

Origin and Development of NFPA 703

In 1957, the Committee on Flameproofing and Preservative Treatments began to develop a standard for the flameproofing of wood. It soon became clear to the Committee that the fire-retardant coating industry was expanding considerably, and that fire-retardant admixtures of plastics and other building materials required coverage in the standard. Thus, in its many subsequent meetings, the Committee reexamined its approach and expanded the standard to cover all fire-retardant treatments.

The standard was tentatively adopted at the 1960 Annual Meeting and was submitted for final adoption at the 1961 Annual Meeting.

The 1979 edition of NFPA 703, *Fire Retardant Impregnated Wood and Fire Retardant Coatings for Building Materials*, superseded the previous 1961 edition. The change in title was necessary to more adequately cover the subjects included in the text of the standard. The principal changes in the 1979 edition included improved definitions for fire-retardant coatings.

The 1985 edition included the addition of a new chapter that listed referenced publications whose use was mandated within the standard.

In the 1992 edition, the Committee provided clarification in several areas defining fire

resistance. The 1995 edition was a reconfirmation with some editorial changes.

The 2000 edition reflected changes in the methods by which treated wood products are evaluated. Other changes were format-driven to reflect the *Manual of Style for NFPA Technical Committee Documents*.

In the 2006 edition, the technical modifications bring the document into agreement with the 2003/2006 editions of *NFPA 5000*, *Building Construction and Safety Code,* on the topic of fire retardant–treated wood. Additional changes were made to the format in compliance with the latest edition of the *Manual of Style for NFPA Technical Committee Documents*.

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This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the application of various building materials that are used in the construction of buildings, structures, and related facilities.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1* Scope.

This standard provides criteria for defining and identifying fire retardant–treated wood and fire retardant–coated building materials.

1.2 Purpose. (Reserved)

1.3 Application. (Reserved)

1.4 Retroactivity.

Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.5 Equivalency.

1.5.1 Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5.2 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.6 Units.

1.6.1 SI Units. Metric units in this standard are in accordance with the modernized metric system known as the International System of Units (SI).

1.6.2 Primary and Equivalent Values. If a value for a measurement as given in this standard is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement. A given equivalent value might be approximate.

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publication.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials,* 2006 edition.

2.3 Other Publications.

2.3.1 ASTM Publications.

American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 2898, *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*, 1994 (2004).

ASTM D 3201, *Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Base Products*, 1994 (2003).

ASTM D 5516, *Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures,* 2003.

ASTM D 5664, *Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber*, 2002.

ASTM D 6305, *Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant Treated Plywood Roof Sheathing,* 2002 e1.

ASTM D 6841, *Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber,* 2003.

ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, 2004.

2.3.2 UL Publication.

Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building*

Materials, 2003.

2.3.3 Other Publication.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections. (Reserved)

Chapter 3 Definitions

3.1 General.

The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary,* 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* **Approved.** Acceptable to the authority having jurisdiction.

3.2.2* **Authority Having Jurisdiction (AHJ).** An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* **Listed.** Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3 General Definitions.

3.3.1 Fire-Retardant Coating. A coating that reduces the flame spread of Douglas fir, and all other tested combustible surfaces to which it is applied, by at least 50 percent or to a flame spread classification value of 75 or less, whichever is the lesser value, and has a smoke developed rating not exceeding 200 when tested in accordance with NFPA 255, ASTM E 84, or UL 723.

3.3.1.1 Class A Fire-Retardant Coating. A coating that reduces the flame spread to 25 or less, and that has a smoke developed rating not exceeding 200 where applied to the applicable substrate, building material, or species of wood when tested in accordance with NFPA 255, ASTM E 84, or UL 723.

3.3.1.2 Class B Fire-Retardant Coating. A coating that reduces the flame spread to greater than 25 but not more than 75, and that has a smoke developed rating not exceeding 200 where applied to the applicable substrate, building material, or species of wood when tested in accordance with NFPA 255, ASTM E 84, or UL 723.

3.3.2 Fire Retardant–Treated Wood. A wood product impregnated with chemical by a pressure process or other means during manufacture, which is tested in accordance with NFPA 255, ASTM E 84, or UL 723, has a listed flame spread of 25 or less, and shows no evidence of significant progressive combustion when the test is continued for an additional 20-minute period; nor does the flame front progress more than 10.5 ft (3.2 m) beyond the centerline of the burners at any time during the test.

Chapter 4 Fire Retardant–Treated Wood

4.1 Application.

These requirements shall apply to fire retardant–treated wood.

4.2 Interior Applications.

Interior fire retardant–treated wood shall have a moisture content of not over 28 percent when tested in accordance with the procedures of ASTM D 3201 at 92 percent relative humidity. Interior fire retardant–treated wood shall be tested in accordance with 4.2.1 or 4.2.2.

4.2.1 Wood Structural Panels. Adjustment to design values for wood structural panels shall be in accordance with the following:

(1) The effect of the treatment, the method of redrying after treatment, and the exposure to high temperatures and high humidities on the flexure properties of fire retardant–treated softwood plywood shall be determined in accordance with ASTM D 5516.

(2) The test data developed by ASTM D 5516 shall be used to develop adjustment factors or maximum loads and spans, or both, for untreated plywood design values in

accordance with ASTM D 6305.

(3) Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for their treatment.

4.2.2 Lumber. Adjustment to design values for lumber shall be in accordance with the following:

(1) For each species of wood treated, the effect of the treatment, the method of redrying after treatment, and the exposure to high temperatures and high humidities on the allowable design properties of fire retardant–treated lumber shall be determined in accordance with ASTM D 5664.

(2) The test data developed by ASTM D 5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D 6841.

(3) Each manufacturer shall publish the modification factors for service at ambient temperatures of up to 100°F (37.8°C) and for service as roof framing.

(4) The roof framing modification factors shall take into consideration the climatological location.

4.3 Exposure to Weather or Damp or Wet Locations.

Where fire retardant–treated wood is exposed to weather or damp or wet locations, it shall be identified as "exterior" to indicate that there is no increase in the listed flame spread index when subjected to ASTM D 2898. *(See 3.3.2, Fire Retardant–Treated Wood.)*

4.4 Moisture Content.

4.4.1 Fire retardant–treated wood shall have a moisture content of 19 percent or less for lumber and 15 percent or less for wood structural panels before use.

4.4.2 For fire retardant–treated wood dried after treatment, the temperatures shall not exceed the temperatures used in drying the lumber and plywood submitted for the testing described in 4.2.1 or 4.2.2.

4.4.3 Fire retardant–treated wood that is air-dried after treatment (ADAT) shall be protected from the weather.

4.5 Labeling.

Fire retardant–treated lumber and wood structural panels shall be labeled and listed with the following information:

(1) Identification mark of an approved agency that lists materials in accordance with Chapter 3*(See 3.2.4, Listed.)*

(2) Identification of the treating manufacturer

(3) Name of the fire-retardant treatment

(4) Species of wood treated

(5) End use of the product

(6) Flame spread and smoke developed rating

(7) Method of drying after treatment

(8) Verification of conformance with appropriate standards in accordance with Sections 4.2 through 4.4

(9) The words "No increase in the listed classification when subjected to the Standard Rain Test (ASTM D 2898)," for fire retardant–treated wood exposed to weather, damp, or wet locations

Chapter 5 Fire-Retardant Coatings for Building Materials

5.1* Application.

These requirements shall apply to fire-retardant coatings such as paints and other surface coatings used to reduce certain burning characteristics of building materials.

5.2 General.

5.2.1* Fire-retardant coatings shall remain stable and adhere to the material under all atmospheric conditions to which the material is exposed.

5.2.2 A fire-retardant coating shall not be used for unprotected outdoor installations unless labeled for such installations.

5.2.3 The classification of fire-retardant coatings shall apply only when the coating is applied at the rates of coverage and to the applicable substrate, building material, or species of wood indicated on the test report when the coating is applied in accordance with the manufacturer's directions supplied with the container.

5.2.4 Fire-retardant coatings shall be applied in accordance with the manufacturer's direction.

5.2.5 The application shall be certified by the applicator as being in conformance with the manufacturer's direction for application.

5.2.6 A fire-retardant coating shall not be overcoated with any material unless both the fire-retardant coating and the overcoat have been tested as a system and are found to meet the requirements of a fire-retardant coating.

5.3 Tests.

5.3.1* Fire-retardant coatings shall be tested by NFPA 255, ASTM E 84, or UL 723.

5.3.2 Where fire-retardant coatings are to be subjected to sustained humidity of 80 percent or more or exposure to the weather, certification by a testing laboratory shall be required to

indicate that there is no increase in listed classification when subjected to the “Standard Rain Test” described in ASTM D 2898.

5.4 Maintenance of Protection.

Fire-retardant coatings shall possess the desired degree of permanency and shall be maintained to retain the effectiveness of the treatment under the service conditions encountered in actual use.

5.5 Identification.

Each container of fire-retardant coating material shall be labeled to indicate conformance with the preceding requirements and shall include the manufacturer's instructions for application.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 Fire resistance ratings measured on an hourly basis are not covered in this standard. To establish such ratings, tests should be made in accordance with NFPA 251.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed

unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.5.1 This section does not address the use of fire-retardant coatings as a thermal barrier.

A.5.2.1 Certain coatings may not be suitable for high-humidity occupancies or for other occupancies where combustible dust or oily residue deposits may accumulate, affecting the ability of the coating to adhere to the substrate material.

A.5.3.1 The flame spread rating is expressed numerically on a scale for which the zero point is fixed by the performance of inorganic-reinforced cement board and the 100 point (approximately) is fixed by the performance of red oak flooring.

Annex B Informational References

B.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

B.1.1 NFPA Publication. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, 2006 edition.

B.1.2 Other Publications. (Reserved)

B.2 Informational References. (Reserved)

B.3 References for Extracts in Informational Sections. (Reserved)