

# CHEMCO SAFERWOOD TECHNICAL INFORMATION AND DESIGN GUIDE

**Real Wood. Made Safer.**™  
*World-class Exterior FRTW since 1981*



# Introduction

## Purpose

This document was written primarily for architects and engineers tasked with designing with fire-retardant-treated lumber and plywood. We will review basic terminology, the standards used to evaluate and test fire-retardant-treated wood (FRTW), the primary codes (both model codes and codes that have been adopted by agencies having jurisdiction), and Chemco's Saferwood technical information. Including a review of wildland urban interface (WUI) requirements.

# Definitions

## Terminology

Authority Having Jurisdiction (AHJ) - Sometimes called the 'Agency' having jurisdiction, the term refers to the appropriate lawmaker, be it federal government law, state law, county or parish law, or the law of a local municipality. Each of these entities can and do influence building codes, diligence is required to determine which authority has jurisdiction (for some projects it may require multiple jurisdictions).

Coating - Currently two types of fire-retardant coatings are on the market, factory applied and in situ (coated on the site). Factory applied generally provides consistent coating thickness, but may be limited to the number of sides coated and may require special transportation. The primary concerns regarding in situ applications are the thickness consistency and appropriate coverage, third-party inspection and certification are often required.

Exterior Wood - Only exterior rated plywood can be fire-retardant-treated for exterior use. Non-exterior rated plywood can only be treated for interior applications. Per most codes any wood that comes in contact with the ground must be treated with acceptable preservatives. Currently there is no single treatment that serves as both a preservative and as a fire-retardant.

Fire-Retardant-Treated Wood (FRTW) - Most codes use this title for wood that has either been pressure treated, or the chemical is impregnated by some other means. FRT lumber and plywood must pass ASTM E84 or UL 723 extended to 30 minutes with a flame spread index of 25 or less and show no evidence of the flame front exceeding 10.5 feet. Most codes also require the treater to label the wood and be contracted to a third-party quality assurance agency for ongoing compliance. The term fire-retardant-treated wood can also apply to FRT wood shakes and shingles, however, most wood shakes and shingles are only tested per ASTM E108 (for use on roofs). If required for use that specifies FRTW, the test method must match the requirements as these two standards are not equivalent.

Ignition Resistance - The definition of this term can be defined differently between codes and AHJs. The general definition is material that: 1) complies with the 30-minute ASTM E84 or UL 723 with a flame spread index of 25 or less and the flame front never exceeded 10.5 feet; 2) is noncombustible as defined by code or AHJ; 3) FRTW; or 4) Class A roof assemblies tested per ASTM E108 or UL 790.

Fire Resistance - A generic term that can be defined by a standard or code. As the name implies, it refers to the ability (intrinsic or otherwise modified) for material to resist fire.

Flame Penetration - Typically applied to a combustible wall (or any barrier that can deteriorate from flame impingement), flame penetration is described as fire penetrating material from one side through to the opposite side. Tests that evaluate penetration are usually reported either as a rate (speed of penetration) or a time period (like a one-hour wall).

Flame Spread - An active fire can spread in any direction on combustible materials (or consume other fuel, such as a gas or liquid). In most flame spread tests conditions are stated (air velocity, size and shape of specimens, orientation of sample, etc.) to minimize the number of potential variables and maximize repeatability and accuracy. The tests that evaluate flame spread either develop a comparative index (like ASTM E84) or report a flame spread rating.

Pressure Treated - The IBC defines wood that is pressure treated as being treated with the appropriate chemical solution under pressure of not less than 50 pounds per square inch gauge (psig).<sup>1</sup> A typical pressure process begins with a period of vacuum followed by a timed period of pressure. The amount of pressure and the time the pressure is applied, depends on the wood species and the classification desired (interior, exterior, etc.)

Smoke Density - The amount of smoke of something that burns can, especially in confined spaces, be equally important as the flame spread since smoke can kill very quickly. Most large-scale fire tests also measure the amount of smoke produced (known as 'smoke density') during the test. Like the flame spread index, a comparative index of smoke density is reported. Some tests have been developed to measure primarily smoke density like ASTM E662 (Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials) a small-scale test that reports smoke density from zero to 800.

WUI - Wildland Urban Interface - This term may be defined differently from one agency to another. One of the better definitions comes from FEMA (Federal Emergency Management Agency) The WUI is the zone of transition between unoccupied land and human development. It is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.<sup>2</sup> See the section titled "What is WUI about?" below for additional information.

## Fire Retardant Treated versus Fire Retardant Coatings

The chemical employed in fire-retardant treated wood is impregnated into the wood either through a pressure process or some other factory process. Typically, the wood is placed in a large autoclave and a vacuum is drawn from the chamber. Next, the fire-

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<sup>1</sup> IBC Section 2303.2.1

<sup>2</sup> *What is the wui?*. U.S. Fire Administration. (2022, June 8). <https://www.usfa.fema.gov/wui/what-is-the-wui.html>.

retardant chemical solution fills the chamber followed by pressurizing the chamber to 50 psi or greater. The length of exposure depends on wood species. Once the time period is finished, the pressure is released and the chamber is drained. The wood is removed from the chamber and allowed to drip dry. The wood is then transported to a kiln for curing for several days before packaging and shipping. It is important to note that this process treats all surfaces.

Fire retardant coatings, as mentioned above, are either factory applied or applied in the field (using special apparatus or manually applied). Factory applied typically can apply a uniform coating but great care needs to be made in transporting to prevent damage to the coating. Plus, factory applied may not coat all sides. Field applied coatings can be more inconsistent, often requiring a third-party to verify coating thickness. One major issue often faced with field application is accessibility to the wood surfaces as some construction will either have tight spaces or have limited time of opportunity. Note: The use of paints, coatings, stains or other surface treatments do not qualify as fire-retardant-treated-wood per IBC Section 2303.2.2 (in both 2018 and 2021 editions).

## Typical Stamp Used to Identify FRTW

<p><b>Chemco, Inc.</b> Ferndale, Washington SaferWood Pressure Treated Fire Retardant Lumber</p> <p>ICC ES Report ESR-1159 ESL 1021</p> <p><b>Classification: Exterior Species:</b></p> <p>Tested per ASTM E84 / UL 723 There was no evidence of significant progressive combustion when the test was extended for 30 min. KDAT</p> <p><b>FSI: SDI:</b></p> <p>Treated (Month/Year)</p> <p><b>QAI LABORATORIES</b> IAS Report NO. AA-635</p>
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<p><b>Chemco, Inc.</b> Ferndale, Washington SaferWood Pressure Treated Fire Retardant Plywood</p> <p>ICC ES Report ESR-1159 ESL 1021</p> <p><b>Classification: Interior Species:</b></p> <p>Tested per ASTM E84 / UL 723 There was no evidence of significant progressive combustion when the test was extended for 30 min. KDAT</p> <p><b>FSI: SDI:</b></p> <p>Treated (Month/Year)</p> <p><b>QAI LABORATORIES</b> IAS Report NO. AA-635</p>
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# Standards

## Introduction

Being an architect or engineer, you are undoubtedly aware that there are hundreds of standard-making entities in the world and most of them sponsor and publish anywhere from one to several thousand standards each. Since there are over one hundred that pertain to fire testing of building materials alone, in this section we will briefly review the more pertinent standards. While there are many others, these are the primary standards recognized and adopted by the various model codes and AHJs relating to fire-retardant treatments and wood used in construction.

Fire testing for building materials can be divided into three primary categories: 1) Full size or large-scale testing, typically as close to end-use application as possible. 2) Medium size or intermediate-scale testing, samples are smaller but results can indicate somewhat how a large-scale test would perform (sometimes used by product manufacturers to evaluate a product before doing a costly full size test). 3) Small-scale test, rarely able to fully represent large-scale test results, but useful for research. Due to the large number of variables in any structure fire, the closer to actual conditions to evaluate building products offers the best fire-resistance information. That is why most codes and AHJs require large-scale testing for product qualification.

Another point to consider regarding fire tests is flame spread or fire penetration. Most fire-retardant treatments are qualified as being fire-retardant-treated wood (FRTW) by the treatment's ability to stop the spread of flame (like ASTM E84). Methods used to evaluate effectiveness of wall assemblies, or similar barriers, typically test for time of flame penetration, again large-scale tests are more accurate for building materials (for example ASTM E119).

## ASTM International (American Society for Testing and Materials)

ASTM was founded in 1898 and has developed and published thousands of test methods and product standards. They are considered by many to be the premier standards-making association in the United States.

ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing. This standard offers several test methods. The variables include different periods of testing, different cycle timings, and with or without ultraviolet light exposure. Method A (twelve weeks of water and dry cycles only) is required for most codes for FRTW, but there are a number of codes that do not specify.

ASTM D5516 - Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures. All fire retardant treatments affect the physical properties of the wood. This standard provides a series of tests that determine the loss of flexural strength in FRT plywood.

ASTM D5664 - Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber. This standard provides a series of tests that determine the loss of bending, compression, shear, and tensile strengths in FRT lumber.

ASTM D6305 - Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing. This standard incorporates the test data from ASTM D5516 to determine appropriate span ratings of FRT plywood.

ASTM D6841 - Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber. This standard uses the test results from ASTM D5664 to determine an appropriate derating factors for each physical property.

ASTM E69 - Test Method for Combustible Properties of Treated Wood by the Fire-Tube Apparatus. A small-scale test used to confirm the fire-retardant treatment process. It is a quality assurance test only and is not used to qualify a FRT product.

ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials. This test method utilizes the "Steiner Tunnel," a 25-foot long horizontal apparatus that requires a 24-foot long by 24-inch wide sample (typically three eight-foot sections). This ten-minute test provides a smoke density index, a fuel contribution index, as well as a flame spread index. No pass or failure criteria is provided in the standard. Some codes categorize the flame spread index into classes (for example see IBC section 803.1.2). Typically a "Class A" rating would be for a FSI between zero and twenty-five. But when evaluating FRT wood, the test is extended twenty minutes (30 minutes total), the FSI needs to be 25 or less and the flame front cannot extend beyond ten and a half feet (see IBC section 2303.2). Although technically still a Class A rating, this requirement is more stringent. The ASTM E2768 standard was developed to minimize confusion (same test just 20 minutes longer), but many model codes and AHJs still refer to ASTM E84 extended to 30 minutes for FRT wood. Please note: Since most wood species cannot pass Class A requirements without some form of treatment, many treaters will treat wood with a fire retardant so that the wood can pass the ten-minute Class A requirement, but that does not qualify the wood as being FRTW. Always look for either ASTM E84 extended 20 minutes or ASTM E2768 on the label or listing mark.

ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings. This standard for testing all kinds of roof coverings is different from most full-scale fire tests as the test specimens, and which tests are to be performed, vary depending which class of fire rating is being sought. Those tests include a burning brand test, an intermittent flame test, a spread of flame test, and a flying brand test. The method does include pass/fail



criteria. The rain test, when required, is to be done in accordance with ASTM D2898 Method A. The method also includes a weathering test but it is not an accelerated weathering test, it requires ten-years of real-time outdoor exposure with testing to be done in 1, 3, 5 and 10-year increments.

ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials. This is a full-scale test, it evaluates fire penetration. The apparatus can be constructed to be either horizontal for testing floors or vertical for testing walls and columns. For example, when a wall is rated a one hour wall, it is determined using this method. Although not used to qualify FRT wood, the use of FRT wood in wall construction can be effective in slowing down fire penetration. The test uses an identical mock-up of the actual wall or floor assembly. A fire resistance rating can be determined for floors, roofs, columns, load-bearing walls and non-load-bearing walls. The method also includes a fire-hose stream resistance test.

ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source. Since the test sample in ASTM E84 is mounted upside down, this method is often preferred to establish a flame-spread rating for floor coverings like carpet that tend to drip when heated.

ASTM E1354 - Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter. The apparatus for this method is often referred to as the "Cone Calorimeter," due to the cone shape of the heater. It is a small-scale test as the specimens are 100 millimeters square and up to 50 millimeters thick. Just as the title of the method states, this method offers a wide range of Information, especially useful for research and development.

ASTM E1623 - Standard Test Method for Determination of Fire and Thermal Parameters of Materials, Products, and Systems Using an Intermediate Scale Calorimeter (ICAL). This in between large-scale and small-scale test uses test specimens one meter square and up to 150 millimeters thick mounted vertically. Due to its size allowance it can test a near-full-size mock-up sample at less cost than a full-scale test. Again, useful for research and development or as a method to pretest a design.

ASTM E2768 - Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test). This method follows the procedures of ASTM E84 with the exception of the test duration being 30 minutes instead of 10 minutes and it specifies a passing criteria (flame spread index for first ten minutes shall be 25 or less and the flame front shall not progress 10.5 feet at any time during the 30 minutes).

ASTM E2957 - Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections. To address the rising concern regarding wildland urban interface (WUI) construction, this standard was originally developed by the California State Fire Marshal to minimize exterior fires from spreading into structures.

# National Fire Protection Association (NFPA)

The NFPA was founded in 1896 devoted to developing standards and awareness to minimize deaths, injuries, property loss, and economic loss due to fire or electrical hazards.

NFPA 101 - Life Safety Code®. Offers building occupant safety strategies based on construction, protection, and occupancy features. Applicable to life safety in both new and existing structures. Includes everything from means of egress and features of fire protection, to hazardous materials emergencies, injuries from falls, and emergency communications.

NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source. This is the same test as ASTM E648.

NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials. This is the same test as ASTM E84. The flame spread index classifications are outlined in NFPA's Life Safety Code (NFPA 101).

NFPA 258 - Recommended Practice for Determining Smoke Generation of Solid Materials. This is the same test as ASTM E662.

NFPA 259 - Standard Test Method for Potential Heat of Building Materials. A small-scale series of tests to determine the potential amount of heat that can be given off most building materials. Often used in research and development. Not typically used for product qualification.

NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. This full-scale test is growing in popularity and interest by many AHJs. It evaluates fire propagation characteristics, especially from one floor to another, in non-load bearing exterior wall assemblies (using a mock up of the wall). It should be noted if a fire resistance rating is required, an ASTM E119 test (or equivalent) would also need to be performed.

NFPA 703 - Standard for Fire Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials. As noted in the title, this standard covers both fire-retardant-treated wood (FRTW) and coated fire-retarded wood. Essentially identical to the IBC definition for fire-retardant-treated wood, with the exception of the coating requirements, as fire-retardant coatings are not allowed in the IBC.

NFPA 5000 - Building Construction and Safety Code®. This code provides requirements for those construction, protection, and occupancy features necessary to safeguard life, health, property, and public welfare and minimize injuries. It offers provisions for regulating and controlling the permitting, design, construction, quality of materials, and use, occupancy, and location of buildings, structures, and specific

equipment.

## Underwriters Laboratories (UL)

Underwriters Laboratories, just as the name implies, was founded in 1894 as a bureau of the National Board of Fire Underwriters. Offering testing services, inspection services, and standards creation for a wide variety of products.

UL 263 - Fire Tests of Building Construction and Materials. This test is identical to ASTM E119.

UL 723 - Test for Surface Burning Characteristics of Building Materials. This test method is essentially identical to ASTM E84. This standard requires that three sets of tests be performed for compliance, ASTM E84 does not.

UL 790 - Standard Test Methods for Fire Tests of Roof Coverings. This test is identical to ASTM E108.

## State Developed Standards

### California

The State Fire Marshal (SFM) developed some of the first standards for exterior wildfire exposure. These six standards are considered the forerunners of several test methods now incorporated in many model codes and adopted by a number of AHJs.

The following state-developed standards are listed in the California Building Code, Title 24, Part 2, Chapter 7A (SFM) Materials and Construction Methods for Exterior Wildfire Exposure. Section 703A.7 Standards of Quality

SFM Standard 12-7A-1, Exterior Wall Siding and Sheathing. A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 10-minute duration.

SFM Standard 12-7A-2, Exterior Windows. A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 8-minute duration.

SFM Standard 12-7A-3, Horizontal Projection Underside A fire resistance test standard consisting of a 300 kW intensity direct flame exposure for a 10-minute duration.

SFM Standard 12-7A- 4, Decking. A two-part test consisting of a heat release rate (Part A) deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration, and a (Part B) sustained deck assembly combustion test consisting of a deck upper surface burning ember exposure with a 12 mph wind for 40 minutes using a 2.2 lbs (1kg) burning "Class A" size 12"x12"x 2.25"

(300 mm x 300 mm x 57 mm) roof test brand.

SFM Standard 12-7A-4A, Decking Alternate Method A. A heat release rate deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration.

SFM Standard 12-7A-5, Ignition-resistant Material. A generic building material surface burning flame spread test standard consisting of an extended 30 minute ASTM E84 or UL 723 test method as is used for fire-retardant-treated wood.

## Internationally Developed Standards

### European Standards (European Norm)

EN 13238 - Reaction to fire tests for building products. Uses ISO 1182 for non-combustibility test; ISO 1716 for heat of combustion test; EN 13823 for single burning item test; ISO 11925-2 for ignitability test; and ISO 9239-1 for floorings.

EN 13501-1 - Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests. (Same series as EN 13238)

EN 13823 - Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item. Sheet products: short wing 495 mm by 1,500mm by no more than 200mm thick; long wing 1,000mm by 1,500mm by no more than 200mm thick.

EN 16755 - Durability of reaction to fire performance. Classes of fire-retardant treated wood products in interior and exterior end use applications. This is a small-scale test that utilize specimens from wood impregnated with a FR solution being 50mm by 25mm by 15mm, and for coated FR, the specimens are 200mm by 100 mm by 2mm.

A standard can have a prefix that signifies that the standard was adopted by that country or is in a different language, for example:

BS - British Standards Institute (BSI)

DIN - Deutsches Institut für Normung (Germany)

### International Organization for Standardization (ISO)

ISO 1182 - Reaction to fire tests for products—Non-combustibility test  
A small-scale test with cylindrical test specimens 45mm in diameter and 50mm in height.

ISO 1716 - Fire technical testing of building products – Determination of calorific potential. A small-scale test that utilizes calorific bomb rate-of-heat combustion

apparatus. Specimen size is 250mm by 250mm, minimum mass is 50g.

ISO 5560-1 - Reaction-to-fire tests — Heat release, smoke production and mass loss rate — Part 1: Heat release rate (cone calorimeter method)

ISO 9239-1 - Reaction to fire tests for floorings — Part 1: Determination of the burning behaviour using a radiant heat source.

ISO 9239-2 - Reaction to fire tests for floorings — Part 2: Determination of flame spread at a heat flux level of 25 kW/m<sup>2</sup>.

ISO 11925-2 - Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test.

ISO/IEC 17020 - Conformity assessment — Requirements for the operation of various types of bodies performing inspection. The standard used to evaluate and accredit inspection agencies involved in overseeing quality assurance of fire-retardant treating manufacturers.

ISO/IEC 17025 - General requirements for the competence of testing and calibration laboratories. The standard used to accredit building materials testing laboratories.

ISO/IEC 17065 - Conformity assessment — Requirements for bodies certifying products, processes and services. The primary standard used to evaluate and accredit certifying bodies and listing services.

## Standards Australia (AS)

AS 1530.8.1 - Methods for fire tests on building materials, components and structures - Tests on elements of construction for buildings exposed to simulated bushfire attack - Radiant heat and small flaming sources.

AS 1530.8.2 - Methods For Fire Tests On Building Materials, Components And Structures - Tests On Elements Of Construction For Buildings Exposed To Simulated Bushfire Attack - Large Flaming Sources.

AS 3959 - Construction of Buildings in Bushfire Prone Areas

## Standards Developed by Other Associations

### ICC Evaluation Service (ICC-ES)

ICC-ES is a subsidiary of the International Code Council (the authors of the International Codes series) initially started as an evaluation service that approved manufacturers, testing laboratories, and inspection agencies per the requirements of the various ICC codes. The testing laboratory and inspection agency accreditation has been

transferred to another ICC subsidiary, the International Accreditation Service (IAS). Currently ICC-ES still offers product evaluations whose findings are given in their evaluation reports (ESR) based on the ICC codes and their Acceptance Criteria. They also now provide product listing services that extend beyond the ICC codes.

Related Acceptance Criteria include:

AC66 Fire-retardant-treated Wood

AC107 Classified Wood Roof Systems

AC516 Factory-Applied Fire-Retardant Penetrant for Wood Structural Panels and Sawn Lumber

Prior to the forming of ICC, there were three model code associations in the United States: the International Conference of Building Officials (ICBO) produced the Uniform Building Code; the Southern Building Code Congress International (SBCCI) wrote the Standard Building Code; and the Building Officials & Code Administrators International (BOCA) created the National Building Code. These three organizations merged and became the International Code Council. But several AHJs and some manufacturers still refer to these 'legacy' codes and their standards. The most widely published and most often referred to set of standards come from the Uniform Building Code Standards. Those that related to fire-retardant-treated wood were:

UBC Standard 8-1 Test Method for Surface-burning Characteristics of Building Materials (equivalent to ASTM E84).

UBC Standard 15-2 Test Standard for Determining the Fire Retardancy of Roof Assemblies (equivalent to ASTM E108).

UBC Standard 23-4 Fire-retardant-treated Wood Tests on Durability and Hygroscopic Properties.

UBC Standard 23-5 Fire-retardant-treated Wood.

## Military Related

MIL-L-19140E Lumber and Plywood, Fire Retardant Treated

Military specification MIL-L-19140E testing requirements are nearly identical to the ICC codes for FRT lumber and plywood. A list of all qualified treaters is maintained by the U.S. Department of Defense (DoD) referred to as their Qualified Products List (QPL). Used mostly for temporary structures, scaffolding, or to prevent fires when welding, some military applications require a blue stripe or other form of blue marking to differentiate from other wood.

## A Word About ANSI

The American National Standards Institute (ANSI) is not a standards developing organization. They are a private, non-profit organization that administers and coordinates voluntary standards and conformity assessment systems in the United States. While vital to the standards making community, the role of ANSI can be confusing. For example, UL 723, Underwriters Laboratories version of the ten-minute test series using the Steiner Tunnel, has been ANSI approved, allowing it to be referenced as UL/ANSI 723 (or ANSI/UL 723). But since ANSI only recognizes one test method of the same procedure, the other standards that read nearly identical, such as ASTM E84, NFPA 255, and UBC Std 8-1 (withdrawn but still referred to in legacy reports) are not recognized by ANSI. Does that mean UL 723 is superior or should be followed instead of the others? No, it just means UL's standard was adopted first.

# Codes

## Introduction

There are two types of building codes, model codes and legal codes. Model codes are just as the name implies, model wording for AHJs to consider for adoption, with or without modification, into their law. Legal codes are those that have been written or adopted and are now the law. Most model codes are updated every three years and legal codes are typically one cycle behind in order for the proposed changes to be reviewed and either be accepted, modified, or rejected. Therefore, all design work and proposals need to comply with the current legal codes, not the model codes.

## International Building Code (IBC)

The IBC is the primary model building code in the United States and has been adopted by all fifty states, the District of Columbia, the U.S. Virgin Islands, Guam, and the Marianas Islands. The IBC applies to all occupancies, including one- and two-family dwellings and townhouses that are not within the scope of the IRC. (Source: [iccsafe.org](http://iccsafe.org))

Regarding all model codes note: The adoption of a code by a state government does not automatically apply to all counties, parishes, cities, or towns within that state. All AHJs can adopt more stringent codes and standards as they deem necessary. The actual figures of adoption are subject to change.

## International Residential Code (IRC)

The IRC has been adopted in forty-nine states (all except Wisconsin), the District of Columbia, the U.S. Virgin Islands, Guam, and the Marianas Islands. The IRC was created to serve as a complete, comprehensive model code regulating the construction of single-family houses, two-family houses (duplexes) and buildings consisting of three or more townhouse units. All buildings within the scope of the IRC are limited to three stories above grade plane. (Source: [iccsafe.org](http://iccsafe.org))

## International Wildland Urban Interface Code (IWUIC)

The IWUIC has been adopted by twenty states (Alabama, Arizona, California, Colorado, Georgia, Idaho, Illinois, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Pennsylvania, South Dakota, Texas, Utah, Washington, and Wyoming). The International Wildland-Urban Interface Code (IWUIC) is a model code that is intended to be adopted and used as a supplement to the adopted building and fire codes of a jurisdiction. The IWUIC has as its objective the establishment of



minimum special regulations for the safeguarding of life and property from the intrusion of fire from wildland fire exposures and fire exposures from adjacent structures and to prevent structure fires from spreading to wildland fuels, even in the absence of fire department intervention. (Source: iccsafe.org)

## Related State Codes

### California

California Building Code, Title 24, Part 2, Chapter 7A, Materials and Construction Methods for Exterior Wildfire Exposure. The testing requirements are described in the 'Standards' section. This code covers construction in all fire hazard severity zones (these zones have been identified and can be viewed online)<sup>3</sup> and WUI locations.

California Building Code, Title 24, Part 2, Chapter 15, Roof Assemblies and Rooftop Structures. Section 1505.6 outlines the requirements for FRT shakes and shingles. The code requires compliance with UBC Standards 15-2, 15-3 or 15-4 and ICC EG107. Both the Uniform Building Code Standards and the Evaluation Guideline 107 have been replaced with the IBC and Acceptance Criteria 107, respectively. See ICC in the 'Standards' section.

California Building Code, Title 24, Part 2, Chapter 23, Wood. Section 2303.2 regarding FRTW reads similar to the IBC, 2021 edition.

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<sup>3</sup> See <https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/>

# The Approval Process

## Evaluation

To obtain approval for building materials to be used, they need to be evaluated for that application, here is a quick summary of that process.

Once a product has been successfully developed and a standardized method to manufacture has been established, the manufacturer's facility is to be inspected and a sample of that product taken and submitted to an ISO/IEC 17025 accredited testing laboratory (the inspection may be performed by the testing company with ISO/IEC 17020 certification or may be an independent inspection service certified to ISO/IEC 17020). If the company's quality control program is found acceptable and the product complies with the test standard and code, pursuant to IBC Section 1701.1, the data will be submitted to an ISO/IEC 17065 accredited certification body selected by the manufacturer for listing as being approved for that building material application.

## Ongoing

For fire-retardant-treated wood, the manufacturer is required by most codes (IBC, AC66, AC98, etc.) to enter into a contract with a third-party ISO/IEC 17020 accredited quality assurance agency to monthly inspect and review their quality control processes.

In addition, some codes also require product testing at regular intervals (for example AC 107 requires quarterly testing). For FRTW, the tests can be either small-scale, such as the ASTM E69 test series, or they can be large-scale, like the ASTM E84 test. If a failure occurs or there is a problem with the manufacturer's QC, per the requirements of ISO/IEC 17020, the manufacturer is required to maintain shipping records that allow for tracing a product to the end user.

## Listing

The ISO/IEC 17065 accredited certification body is required to provide a publicly accessible list of the product's compliance and publish a report that states compliance with the appropriate product test standards along with a list of the findings (or calculations derived from the testing) and identify the third-party quality ISO/IEC 17020 certified assurance agency with examples of the product's marking (can be a label or a stamp).

Currently there are over sixty ISO/IEC 17065 certification bodies in the United States today that are accredited to perform this service. It is important for manufacturers to choose an experienced and reputable organization. That is why Chemco selected ICC

Evaluation Service, the subsidiary of ICC, the authors of all the International codes, to list their products.

# Applications

## Building Code Allowances

Since the International Code Council's (ICC) International Building Code (IBC) and International Residential Code (IRC) have been accepted, either in part or in whole, by more Authorities Having Jurisdiction (AHJ) in the United States than any of the model codes, this list is based on those two documents. This list of code allowances does not apply to Canada, Canadian provinces, or any other foreign equivalent of an AHJ. This list is provided only as a guideline, any application should always be reviewed for compliance with the local code or law.

Referenced Construction Locations	IBC Section Number
Balconies in Type I and II construction	603.1
Bay and oriel windows	705.2.4
Canopies over fuel dispensers	406.7.2
Children's play structures	424.2
Decks in Type I and II construction	603.1
Exterior stairways in Type I and II construction	603.1
Exterior wall assemblies for Type III construction	602.3
Exterior wall assemblies for Type IV construction	602.4.1
Exterior wall assemblies for Type IV construction using cross-laminated timber	602.4.2
Exterior wall covering for Type I, II, III, and IV construction	1405.1.1 exception 3
Exterior wall wood veneers	1404.5
Fire wall continuity in buildings of Type III, IV, and V construction can terminate at the underside of roof	706.6 exception 4.3
Interior wood studs per Item 14-1.4	Table 721.1(2)
Interior wood studs per Item 14-1.6	Table 721.1(2)
Interior wood studs per Item 15-1.6	Table 721.1(2)
Kiosks in a mall	402.6.2
Liquid storage room shelving	415.11.5.2
Nonbearing exterior walls in Type I and II construction	603.1
Nonbearing partitions in Type I and II	603.1

construction	
Parapets in Groups R-2 and R-3 in buildings with Class C roof coverings	705.11 exception 5
Platforms in theaters	410.3
Porches in Type I and II construction	603.1
Projection of exterior walls	705.2.3
Roof assemblies fire classification	1505.1
Roof assembly materials	1505.6
Roof construction in Type I and II construction	603.1
Separate structure pedestrian walkway construction	3104.3
Towers, spires, domes, and cupolas for Type I, II, III, and IV construction	1511.6 (2021 IBC)
Unprotected members of primary structural frame for Type I, II, III, and V construction	Table 601 footnote B

<b>Referenced Construction Locations</b>	<b>IRC Section Numbers</b>
Parapets for townhouses	R302.2.4
Roof covering using wood shakes and shingles	R902.2
Roof mounted thermal energy collectors	M2301.2.2.1
Wood roof framing	R802.1.5
Wood roof sheathing	R803.2.1.2

# What is WUI all about?

## Introduction

Fire regulations in areas identified as “wildland urban interfaces” is nothing new. But due to an increase of large forest fires and significant loss of structures as a result of those fires in the last twenty years, the awareness of the need to establish good practices for both property owners, and any AHJs that would respond if a fire were to occur, has become an urgent matter. One answer to this seemingly insurmountable problem would be to develop new overarching regulations and implement them. New guidelines were needed for 1) new construction in areas that are directly adjacent to wildland fire potential; 2) inspections and enforcement to assure compliance; 3) methods to minimize fire risk; 4) provide minimal equipment requirements for any fire-fighting equipment; 5) a method to review and establish fire apparatus accessibility; 6) promote fire suppression planning; and 7) identify any potential fire risk. With a scope as broad as this, it is easy to see that any code developed would need to be very unique from all other similar codes.

California state was the first to develop and codify laws regarding wildland urban interfaces. In addition, several unique test methods were created to evaluate products such as decking materials and siding designed to assess their fire propagation. California’s program got the attention of neighboring states and soon ICC developed the International Wildland Urban Interface Code (IWUIC) as a model code for any AHJ to adopt.

Chapter five of the IWUIC identifies the building material requirements. Since much of the focus is on the exterior side of structures in a WUI area, exterior rated fire-retardant-treated wood is one of the approved building materials in the code. Exterior Saferwood-FX is approved for that application. Currently Chemco maintains the only ICC Evaluation Service approval for exterior fire-retardant-treated lumber and plywood. In addition, Chemco is the only ICC-ES approved FRTW treater that has wood that complies with Section 503.2, Item 3 of the IWUIC as an ignition-resistant building material and may be used in exterior design and construction of buildings (see ICC-ES ESR-1159).

## Special Building Construction Regulations

The fire-resistance-rated construction is based on the property’s fire hazard severity. A chart is provided in Section 502 of the IWUIC to identify the fire hazard severity and identify what level of fire-resistance construction is required for each location. If the assessment identifies a high level of severity, other recommendations are offered such as clearing vegetation. Section 503 defines the requirements for Ignition-Resistant Construction and Materials. This section also identifies and defines three classes of

ignition-resistant construction, with Class 1 being the most stringent.

Here is a quick breakdown of where fire-retardant-treated wood is allowed in the IWUIC:

<b>Referenced Locations</b>	<b>IWUIC Section Numbers</b>
Class I Ignition-resistant construction - Appendages and projections	504.7
Class I Ignition-resistant construction - Detached accessory structures	504.11
Class I Ignition-resistant construction - Exterior walls	504.5
Class I Ignition-resistant construction - Protection of eaves	504.3
Class I Ignition-resistant construction - Underfloor exposure	504.6
Class II Ignition-resistant construction - Appendages and projections	505.7
Class II Ignition-resistant construction - Detached accessory structures	505.11
Class II Ignition-resistant construction - Exterior walls	505.5
Class II Ignition-resistant construction - Underfloor exposure	505.6
Class III Ignition-resistant construction - Underfloor exposure	506.3
Ignition-resistant building material	503.2

# SaferWood

## Approvals

### ICC Evaluation Service (ICC-ES)

As a subsidiary of ICC, the creator and publisher of the International Code series, ICC-ES utilizes that experience to provide one of the more comprehensive report and listing services available for building materials and products.

ESR-1159 Fire-Retardant-Treated Wood interior and exterior products report stating compliance with the 2006, 2009, 2012, 2015, and 2018 editions of the International Building Code (IBC) and the International Residential Building Code (IRC); the 2019 editions of the California Building Code (CBC) and the California Residential Code (CRC); the 2009, 2012, 2015, and 2018 edition of the International Wildland-Urban Interface Code (IWUIC) Section 503.2, Item 3 as an ignition-resistant material; and compliance with AC66.

ESR-1410 Fire-Retardant-Treated Wood Shakes and Shingles report stating compliance with the 2006, 2009, and 2012 editions of the International Building Code (IBC) and the International Residential Building Code (IRC) and compliance with AC107 for Class B and Class C standalone roof coverings and Class A roof assemblies.

ESL-1021 Interior and Exterior Fire-Retardant-Treated Wood listing stating compliance with CAN/ULC-S102 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies, Underwriters Laboratories of Canada.

## State of California

California Department of Forestry & Fire Protection

Office of the State Fire Marshal

Fire Engineering & Investigations Division

Building Materials Listing Program

Category 2520 - Treated Lumber

Listing Number: 2520-1450:0502

Chemco Exterior Fire Retardant Treated Redwood and Western Red Cedar Lumber (Thermex-FR). Products are pressure impregnated with Thermex-FR fire retardant chemical.

## City of Los Angeles

Research Report RR 2582 - Fire Retardant Treated Wood for sawn lumber and plywood.



# United States Department of Defense

Qualified Products List QPL-19140 Type II (exterior) Lumber, Plywood, Laminated Veneer, Category 2, ID (FRX/Thermex-FR)

## Derating Requirements for Saferwood-FX

All wood treatments, including all fire-retardant treatments on wood, affect the physical properties of that wood. Some species are more susceptible and require greater derating, while other species have negligible changes in physical properties. The following are tables from ESR-1159 for engineers and architects to adjust the physical properties of Saferwood-FX lumber and plywood according to their application. These treated wood stress adjustments are per the requirements of IBC Section 2306.1.3.

**TABLE 1—DESIGN VALUE ADJUSTMENT FACTORS FOR SAFERWOOD-FX FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER [APPLICABLE AT SERVICE TEMPERATURES UP TO 100°F (38°C)]<sup>1</sup>**

PROPERTY	SPECIES			
	SOUTHERN PINE	DOUGLAS FIR	SPRUCE-PINE-FIR	WESTERN RED CEDAR / REDWOOD / WESTERN HEM-FIR
Bending MOR	0.81	0.99	0.94	0.81
Bending MOE	0.97	1.0	1.0	0.97
Tension Parallel to Grain	0.76	0.80	0.88	0.76
Shear Parallel to Grain	0.95	0.95	0.89	0.89
Compression Parallel to Grain	1.0	1.0	0.94	0.94
Compression Perpendicular to Grain	0.95	0.95	0.95	0.95
Fasteners/connectors	0.90	0.90	0.89	0.89

<sup>1</sup>Duration of load adjustments for snow loads, seven-day (construction) loads, and wind loads specified in the IBC are permissible.

**TABLE 2—DESIGN VALUE ADJUSTMENT FACTORS FOR SAFERWOOD-FX FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER [APPLICABLE AT SERVICE TEMPERATURES UP TO 150°F (66°C)]**

PROPERTY	SPECIES											
	SOUTHERN PINE			DOUGLAS FIR			SPRUCE-PINE-FIR			WESTERN RED CEDAR / REDWOOD / WESTERN HEM-FIR		
	CLIMATE ZONE			CLIMATE ZONE			CLIMATE ZONE			CLIMATE ZONE		
	1A	1B	2	1A	1B	2	1A	1B	2	1A	1B	2
Bending MOR	0.24	0.47	0.73	0.84	0.90	0.97	0.76	0.84	0.91	0.24	0.47	0.73
Bending MOE	0.94	0.95	0.97	0.95	0.99	1.0	0.99	1.0	1.0	0.94	0.95	0.97
Tension Parallel to Grain	0.34	0.54	0.71	0.8	0.8	0.8	0.65	0.77	0.87	0.34	0.54	0.71
Shear Parallel to Grain	0.51	0.73	0.91	0.83	0.91	0.98	0.65	0.77	0.89	0.51	0.73	0.89
Compression Parallel to Grain	0.56	0.78	0.96	0.84	0.92	0.99	0.70	0.82	0.94	0.56	0.78	0.94
Compression Perpendicular to Grain,	0.95			0.95			0.95			0.95		
Fasteners/connectors	0.51	0.73	0.91	0.83	0.90	0.90	0.65	0.77	0.89	0.51	0.73	0.89

**Climate Zone definitions:**

- Zone 1—Where minimum roof live load or maximum ground snow load ≤ 20 psf (960 Pa)
- Zone 1A—Southwest Arizona, southeast Nevada (Las Vegas, Yuma-Phoenix-Tucson triangle)
- Zone 1B—All other qualifying areas on the continental United States
- Zone 2—Minimum ground snow load ≥ 20 psf (960 Pa)

**TABLE 3 - ALLOWABLE LIVE LOADS FOR ROOF SHEATHING (PSF) FOR SAFERWOOD-FX FIRE-RETARDANT-TREATED PLYWOOD APPLICABLE UP TO 170°F (77°C)**

**CLIMATE ZONE 1A**

Thickness (inch)	SPAN (inches)									
	12	16	19.2	24	30	32	36	40	48	60
5/16	64	32	-	-	-	-	-	-	-	-
3/8	105	55	35	-	-	-	-	-	-	-
15/32, 1/2	154	82	54	31	-	-	-	-	-	-
19/32, 5/8	247	135	91	54	31	-	-	-	-	-
23/32, 3/4	314	172	116	71	42	35	-	-	-	-
7/8	397	219	149	92	55	47	-	-	-	-
1	533	296	202	126	77	66	38	-	-	-
1-1/8	676	376	258	161	100	86	51	39	-	-

**CLIMATE ZONE 1B**

Thickness (inch)	SPAN (inches)									
	12	16	19.2	24	30	32	36	40	48	60
5/16	105	55	35	-	-	-	-	-	-	-
3/8	158	80	49	34	-	-	-	-	-	-
15/32, 1/2	244	133	89	54	31	-	-	-	-	-
19/32, 5/8	388	214	146	90	54	46	-	-	-	-
23/32, 3/4	490	271	185	115	70	60	35	-	-	-
7/8	619	344	236	147	91	78	46	35	-	-
1	830	463	318	200	124	108	65	50	-	-
1-1/8	1051	587	404	255	160	139	84	66	43	-

**CLIMATE ZONE 2**

Thickness (inch)	SPAN (inches)									
	12	16	19.2	24	30	32	36	40	48	60
5/16	157	84	55	32	-	-	-	-	-	-
3/8	248	135	91	55	31	-	-	-	-	-
15/32, 1/2	359	198	134	82	49	42	-	-	-	-
19/32, 5/8	568	315	216	135	83	71	41	-	-	-
23/32, 3/4	717	399	274	172	106	92	55	42	-	-
7/8	903	504	347	218	136	118	71	56	36	-
1	1210	676	507	295	185	162	98	78	36	-
1-1/8	1530	856	592	375	236	207	127	102	67	39

For SI: 1 inch = 25.4 mm, 1 psf = 47.9 N/m<sup>2</sup>

1. Fastener size and spacing must be as required in the applicable code for untreated plywood of the same thickness.
2. Plywood must be Structural I grade, exterior plywood.
3. Live loads in table are based on plywood panel size of 4' by 8' with plywood face grain across (perpendicular to) the supports.
4. Tabulated loads are based on bending. Live loads for Zone 1A are based on duration of load adjustment for 7-day (construction) loads of 1.25.
5. Tabulated loads for Zone 1B and Zone 2 are based on duration of load adjustment for snow of 1.15.
6. A dead load of 10 psf was used to determine the allowable live loads.
7. Span not to exceed pre-treatment span rating.
8. Chemco does not recommend 5/16" or 3/8" panel thicknesses for roofing applications.

Climate Zone definitions:

- Zone 1 - Locations where minimum roof live load or maximum ground snow load ≤ 20 psf (960 Pa)
- Zone 1A - Southwest Arizona, Southeast Nevada (Las Vegas, Yuma-Phoenix, Tucson triangle)
- Zone 1B - All other qualifying areas on the continental United States
- Zone 2 - Minimum ground snow load ≥ 20 psf (960 Pa)

**Can you coat, paint, varnish, or stain Saferwood?**

## What fasteners can be used?

All fasteners, including any nuts and washers need to be either hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze, or copper. Staples need to be made of stainless steel. Any fasteners other than nails, staples, timber rivets, wood screws, and lag screws, need to be of a mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B695, Class 55 minimum. (See IBC Section 2304.10)

## Features

### Warranty

THIS LIMITED LIFETIME WARRANTY AGREEMENT (“WARRANTY”) IS BETWEEN CHEMCO, INC. (“CHEMCO”) AND THE REGISTERED OWNER (DEFINED BELOW). THE WARRANTY IS FOR THE USEFUL LIFE OF THE TREATED PRODUCTS AND COVERS CHEMCO’S FIRE RETARDANT TREATMENT (“WARRANTED TREATMENT”) OF DECKING, PLYWOOD SHEATHING, SIDING, LUMBER, SOFFIT, AND FACIA WOOD PRODUCTS FOR EXTERIOR USE (“PRODUCT” OR “PRODUCTS”). THE TERMS OF THE WARRANTY ARE SET OUT BELOW. CHEMCO’S LIMITED LIFETIME WARRANTY ON FIRE RETARDANT TREATMENT OF EXTERIOR USE WOOD PRODUCTS USEFUL LIFE LIMITED WARRANTY. The Warranted Treatment will meet or exceed the fire retardation standard set forth in the applicable provisions of ASTM E-84 and ASTM D2898 in effect at the time of treatment for the treated Product’s useful life.

CLAIM PROCESS. WITHIN THIRTY (30) DAYS after discovery of a possible failure, breach or defect, the registered Owner must send a detailed written description of the problem to Chemco, Attn. Warranty Claims, P.O. Box 875, WA 98248. Chemco reserves the right to have a representative inspect the treated Product at the registered structure and to remove Product samples from the structure. Results or reports of any testing by or for Registrant must be shared with Chemco along with a certification that the Product tested was removed from the Owner’s registered structure. ANY ALTERATION, REMOVAL OR REPAIR OF THE ALLEGEDLY DEFECTIVE PRODUCT PRIOR TO A REASONABLE OPPORTUNITY FOR CHEMCO TO INSPECT SHALL BAR ANY RIGHTS FOR RELIEF A REGISTERED OWNER WOULD OTHERWISE HAVE UNDER THIS WARRANTY. EXCLUSIVE REMEDY. In the event of a breach of the warranty followed by a documented and timely warranty claim, Chemco will, at its sole option, either: (i) pay to the registered Owner of the registered structure a “pro rata refund” based on the amount paid by the Original Owner that represents the cost of the Warranted Treatment of the affected Product and multiplying that sum by the percentage of the useful life of the Product remaining or (ii) provide the registered Owner at no charge with replacement Chemco fire retardant treatment services on complying Product provided at the Owner’s cost. These remedies are the sole and exclusive remedies available to a registered Owner against Chemco or its affiliates, owners, managers, officers, employees, resellers, agents, or representatives under this

Warranty or otherwise, under any legal theory, on account of some negligence or misconduct by Chemco (or its resellers, agents, employees, owners, or officers), or breach of warranty or defect in or problem with the Warranted Treatment. LIMITATIONS AND EXCLUSIONS. This Warranty is not effective unless either each piece of applicable treated product installed in the registered structure had a Chemco treatment label and applicable treatment certification or the homeowner must be able to produce the certification of treatment that was issued by Chemco. This Warranty only covers the Warranted Treatment, not the underlying Products themselves. Chemco does not warrant the merchantability or fitness of the underlying Products for any specific use, or the Products' compliance with any applicable grading or labeling requirements. This Warranty is only effective if 100% of the applicable fire retardant treated Product in the installed structure was treated by Chemco. The following exclusions apply to this Warranty: 1. Misapplication, Faulty Design, Improper Installation or Maintenance. The Warranty does not apply to any defect caused by (a) construction workmanship, (b) use of substandard, noncomplying or improper materials, components or fasteners, (c) improper handling, transport, storage (Product should be kept dry), or installation, (d) application of the treated Product for a use or purpose not recognized or recommended by Chemco's specifications, applicable building codes, or good construction practices (e) failure to follow or comply with applicable construction or installation instructions, standards, codes or requirements, (f) faulty design, (g) improper milling or surfacing, (h) ground contact installation or lack of proper drainage; (i) lack of regular and proper maintenance, (j) improper or incorrectly performed or attempted repair, (k) misapplication of solvents, chemicals, or cleaning materials; or (l) improper or inadequate underlayment or ventilation, (m) failure to remove buildup of debris or overgrowth of vegetation. 2. Additional Costs. Tear-off costs (demolition or removal of materials, products, underlayment, etc.) and the cost of installing, repairing or replacing venting, metal work, flashings, underlayment, fasteners or other related materials will not be covered or reimbursed. 3. Extended Risks. Defects, damage, problems or degradation due to insects, animals, violent weather (such as hurricane, tornado, hail, lightning, or flood) explosion, mudslide, earthquake, volcanic eruption, falling objects, aircraft, vehicles, accidents, riot, civil commotion, war or acts of God are not warranted. PLEASE NOTE: The useful life of the underlying Product and the Warranted Treatment may be adversely affected by factors beyond Chemco's control such as: climate conditions (temperature, salt air, humidity); quality of installation; quality and appropriateness of installation materials, including underlayments and fasteners; normal wear and tear; and ventilation. 4. Discoverable Unreported Defects. If any claimed defect or problem in the Warranted Treatment or treated Product would have been revealed upon reasonable inspection by the installer, purchaser or Owner, or their respective agents, and the treated Product is installed, assembled, altered or modified without notice to and opportunity for Chemco to cure the alleged defect or problem prior to such actions, this Warranty will not apply to the affected treated Product. 5. Paints and Coatings. This Warranty does not cover any defects, damage, problems THIS LIMITED LIFETIME WARRANTY AGREEMENT ("WARRANTY") IS BETWEEN CHEMCO, INC. ("CHEMCO") AND THE REGISTERED OWNER (DEFINED BELOW). THE WARRANTY IS FOR THE USEFUL LIFE OF THE TREATED PRODUCTS AND COVERS CHEMCO'S FIRE RETARDANT TREATMENT ('WARRANTED

TREATMENT”) OF DECKING, PLYWOOD SHEATHING, SIDING, LUMBER, SOFFIT, AND FACIA WOOD PRODUCTS FOR EXTERIOR USE (“PRODUCT” OR “PRODUCTS”). THE TERMS OF THE WARRANTY ARE SET OUT BELOW. CHEMCO’S LIMITED LIFETIME WARRANTY ON FIRE RETARDANT TREATMENT OF EXTERIOR USE WOOD PRODUCTS USEFUL LIFE LIMITED WARRANTY. The Warranted Treatment will meet or exceed the fire retardation standard set forth in the applicable provisions of ASTM E-84 and ASTM D2898 in effect at the time of treatment for the treated Product’s useful life. PERSONS COVERED. This Warranty is non-transferable and applies solely to the original registered owner of a structure at the time the Chemco treated wood was installed. If the installed building or structure is a newly built, unoccupied home or building, and title is initially held by the original builder or developer who purchased and installed the material, then the warranty may be registered by the first subsequent new homeowner within (120) days upon completion of the sale and the new homeowner has taken possession of the property. YOU MUST REGISTER TO BENEFIT FROM THIS LIMITED WARRANTY. For instructions on how you must register to qualify, please see the reverse side of this document. or degradation due to the use of paints, coatings, sealants or other solutions on the treated Product. BEFORE USING ANY PAINT, STAIN OR OTHER COATING ON TREATED PRODUCT, YOU SHOULD CONSULT WITH A COATINGS EXPERT OR MANUFACTURER TO ASSURE YOURSELF THAT ANY RECOMMENDED COATING HAS BEEN SUCCESSFULLY TESTED ON THE TREATED PRODUCT. CHEMCO DOES NOT WARRANT OR ENDORSE ANY COATING PRODUCT OR MANUFACTURER. PLEASE REVIEW CHEMCO’S INFORMATIONAL NOTICE ON PAINTS AND COATINGS. Review at: <https://www.chemco.org/saferwood/painting-and-staining> 6. Modifications and Repairs. This Warranty does not cover any defects, damage, problems or degradation due to modifications, repairs, or alterations made to treated Product after original installation, including the subsequent installation of skylights, venting, windows, doors, solar heating apparatus or other equipment. 7. Strength Limitations. Fire Retardant treatment can affect the strength characteristics of the treated material. Please refer to <https://www.chemco.org/media/ESR-1159.pdf> for strength adjustments. DISCLAIMER AND LIMITATION OF LIABILITY. THIS USEFUL LIFE LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, ORAL OR WRITTEN, EXPRESS OR IMPLIED. CHEMCO EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT THAT SUCH A DISCLAIMER OF IMPLIED WARRANTIES IS NOT ENFORCEABLE UNDER APPLICABLE LAW, CHEMCO LIMITS ANY LEGALLY REQUIRED IMPLIED WARRANTY TO THE MINIMUM DURATION AND SCOPE AUTHORIZED BY LAW. CHEMCO DOES NOT WARRANT THAT THE WARRANTED TREATMENT IS APPROPRIATE FOR THE PURCHASER OR OWNER’S PURPOSES. EXCEPT AS MAY BE OTHERWISE PROVIDED IN THIS WARRANTY, THE ENTIRE RISK AS TO THE RESULTS AND PERFORMANCE IS ASSUMED BY THE PURCHASER AND OWNER. CHEMCO SHALL NOT BE LIABLE FOR ANY INCIDENTAL, INDIRECT, CONSEQUENTIAL, PUNITIVE, PERSONAL OR PROPERTY DAMAGES (INCLUDING LOST PROFITS, DELAY DAMAGES, OR DAMAGE TO THE REGISTERED

STRUCTURE OR ITS CONTENTS) RESULTING IN ANY WAY FROM THE INSTALLATION AND USE OF TREATED PRODUCT, EVEN IF CHEMCO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN ANY EVENT, AND SPECIFICALLY IF THE REMEDIES PROVIDED BY CHEMCO UNDER THIS 50 YEAR LIMITED WARRANTY ARE FOUND LEGALLY INSUFFICIENT OR TO FAIL OF THEIR ESSENTIAL PURPOSE, THE MAXIMUM LIABILITY OF CHEMCO ON ACCOUNT OF ANY LOSS OR CLAIM IN ANY WAY ARISING UNDER OR RELATED TO THIS WARRANTY, OR TO THE INSTALLATION OR USE OF GOODS SUBJECT TO THIS WARRANTY, UNDER ANY LEGAL THEORY OF RECOVERY (CONTRACT, TORT, STRICT LIABILITY, OR STATUTE), IS THE TOTAL COST PAID BY THE PURCHASER OR OWNER FOR THE TREATED PRODUCT WITH A PRO RATA DEDUCTION BASED ON THE OWNER'S PRIOR USE AND ENJOYMENT AND THE FIFTY YEAR PERIOD OF THE WARRANTY. ARBITRATION OF DISPUTES AND GOVERNING LAW. The purchaser and Registered Owners agree that any and all disputes or controversies in any way arising out of, or relating to, this Warranty or the Products subject to this Warranty, shall be fully and finally resolved by confidential arbitration (using a panel of three (3) arbitrators for claims over \$50,000 and a single arbitrator for claims of \$50,000 or less), administered by the American Arbitration Association, in accordance with its then-current the Commercial Arbitration Rules. Any arbitration shall be conducted and resolved on an individual basis only and not on a class-wide, multiple plaintiff, consolidated, or similar basis. The parties understand and agree that they are waiving rights to seek remedies in court, including the right to a jury trial, and that they are waiving the right to pursue a claim or defense as a class action or by class or multi-party arbitration. In the event any term or provision of this paragraph shall to any extent be invalid or unenforceable, the remainder shall be valid and enforced to the fullest extent permitted by law. The exclusive venue and place of arbitration is Seattle, Washington. The law of Washington will apply to any dispute between the parties in any way arising under or related to this Warranty or otherwise, under any legal theory, without regard to Washington's conflict of law rules. ENTIRE AGREEMENT. This document contains the entire Warranty and may not be modified, altered, amended, or supplemented in any way by any wholesaler, dealer, roofer, installer, contractor, representative or manufacturer other than Chemco, and then only by means of a document signed by an authorized officer of Chemco. GOVERNING STATE LAW MAY LIMIT OR OTHERWISE AFFECT YOUR RIGHTS UNDER THIS WARRANTY, AND MAY PROVIDE YOU WITH YOU DIFFERENT OR ADDITIONAL SPECIFIC LEGAL RIGHTS NOT EXPRESSED IN THIS WARRANT

## Termite Resistance

## Where to Find Saferwood

## Same Process - Different Names

Chemco's process for treating wood to produce fire-retardant-treated wood is the same process used for a variety of customers and is marketed under several names including: Saferwood, Saferwood-FX, Thermex-FR, FRX, Mataverde, Flame Repel, and Fireline.