

ICC-ES Evaluation Report

ESR-4521

Issued June 2024

This report also contains:


- LABC Supplement

Subject to renewal June 2025

- CBC Supplement

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<p>DIVISION: 06 00 00 WOOD, PLASTICS AND COMPOSITES</p> <p>Section: 06 05 73.13– Fire-Retardant Wood Treatment</p>	<p>REPORT HOLDER: ZEROIGNITION TECHNOLOGIES, INC.</p>	<p>EVALUATION SUBJECT: TRUEFR® FIRE-RETARDANT-TREATED WOOD</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021 and 2018 [International Building Code® \(IBC\)](#)
- 2021 and 2018 [International Residential Code® \(IRC\)](#)

Property evaluated:

- Flame spread
- Structural
- Corrosion
- Hygroscopicity

2.0 USES

TrueFR® fire-retardant-treated lumber is used in areas that are not exposed to the weather or wetting, but may be exposed to dampness where the code permits the use of wood or fire-retardant-treated wood.

3.0 DESCRIPTION

3.1 General:

TrueFR® fire-retardant-treated wood is lumber that is produced using a proprietary process involving the impregnation and reaction of the physical and chemical composition of the wood with True FR® fire-retardant chemicals that includes a pressure and curing process. TrueFR® fire-retardant-treated wood is kiln-dried after treatment to a moisture content of 19% or less. TrueFR® treatment of lumber of the following species has been evaluated:

Douglas Fir

3.2 Flame Spread:

TrueFR® fire-retardant-treated wood has a flame-spread index of 25 or less and a smoke developed index of 450 or less when subjected to ASTM E84 tests and shows no evidence of significant progressive combustion when the tests are continued for an additional 20-minute period.

3.3 Structural Strength and Durability:

The effects of TrueFR® fire-retardant-treatment on the strength of the treated lumber must be accounted for in the design of the wood members and their connections. Load duration factors greater than 1.6 are not permitted to be used in the design.

The strength properties up to 100°F (38°C), are subject to the design factors shown in [Table 1](#) of this report. The strength properties of lumber when treated with TrueFR[®] fire-retardant chemicals and used in applications at ambient temperatures up to 150°F (66°C), are subject to the design factors shown in [Table 2](#) of this report.

3.4 Corrosion:

The corrosion rate of aluminum, carbon steel, galvanized steel, stainless steel or red brass in contact with wood is not increased by TrueFR[®] fire-retardant treatment when the product is used as recommended by the manufacturer.

3.5 Hygroscopicity:

TrueFR[®] treated wood qualifies as an Interior Type A (HT) fire-retardant wood in accordance with the American Wood Protection Association (AWPA) Standard U1, Commodity Specification H, Use Category UCFA when tested at 92 percent relative humidity.

4.0 DESIGN AND INSTALLATION

4.1 General:

Structural systems that include TrueFR[®] fire-retardant-treated lumber must be designed and installed in accordance with the applicable code using the appropriate lumber design value adjustment factors in [Tables 1](#) and [2](#) of this report. Ventilation must be provided in accordance with the applicable codes.

The design value adjustment factors in [Tables 1](#) and [2](#) of this report are applicable under elevated temperatures resulting from cyclic climatic conditions. They are not applicable under the continuous elevated temperatures resulting from manufacturing or other processes that require special consideration in design.

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

4.2 Fasteners:

Fasteners used in TrueFR[®] fire-retardant-treated wood must be in accordance with 2021 IBC Section 2304.10.6 (2018 IBC Section 2304.10.5) and IRC Section R317.3.4, except that aluminum fasteners and carbon steel fasteners are also permitted when used for interior applications. Fasteners must be subject to the design value adjustments indicated in [Table 1](#) of this report.

5.0 CONDITIONS OF USE:

The TrueFR[®] fire-retardant-treated wood described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Strength calculations must be subjected to the design factors in [Tables 1](#) and [2](#) of this report.
- 5.2 The design adjustment factors given in this report must only be used for unincised dimension lumber of the species noted in this report.
- 5.3 TrueFR[®] fire-retardant-treated wood must not be installed where it will be exposed to precipitation, direct wetting or regular condensation.
- 5.4 TrueFR[®] fire-retardant-treated wood must not be used in contact with the ground.
- 5.5 TrueFR[®] fire-retardant-treated lumber must not be ripped or milled as this will alter the surface-burning characteristics and invalidate the flame spread classification. Framing end cuts, holes, joints such as tongue and groove, bevel scarf and lap may be used.
- 5.6 Treatment is performed in North Bend, Oregon, under a quality control program with inspections by ICC-ES and Timber Products Inspection, Inc. (AA-696).

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Fire-retardant-treated Wood \(AC66\)](#), dated June 2015 (editorially revised February 2021).

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4521) along with the name, registered trademark, or registered logo of the report holder, Zeroignition Technologies, Inc., must be included in the product label.

7.2 In addition, the lumber treated with TrueFR[®] fire-retardant chemicals must be identified by the structural grade mark of an approved agency [Timber Products Inspection, Inc. (AA-696)], name and location; labeling information in accordance with IBC Section 2303.2.4 or IRC Section R802.1.5.4. Refer to [Figure 1](#).

7.3 The report holder’s contact information is the following:

ZEROIGNITION TECHNOLOGIES, INC.
SUITE 401, 5162 DUKE STREET
HALIFAX, NOVA SCOTIA, B3J 1N7
CANADA
(604) 578 – 8238
www.zeroignition.com

TABLE 1 — STRENGTH DESIGN FACTORS FOR TRUEFR[®] FIRE RETARDANT TREATED LUMBER COMPARED TO UNTREATED LUMBER APPLICABLE AT SERVICE TEMPERATURES UP TO 100°F (38°C)

STRENGTH DESIGN FACTORS	DOUGLAS FIR
Modulus of Rupture (MOR), [F _b]	1.00
Modulus of Elasticity (MOE), [E]	1.00
Ultimate Tensile Strength (UTS), [F _t]	1.00
Maximum Compressive Strength (MCS), [F _c]	1.00
Ultimate Shear Strength (USS), [F _v]	0.97
Fasteners/Connectors	0.90

TABLE 2 — STRENGTH DESIGN FACTORS FOR TRUEFR[®] FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER APPLICABLE AT SERVICE TEMPERATURES UP TO 150°F (66°C)^{1,2}

STRENGTH DESIGN FACTORS	DOUGLAS FIR		
	CLIMATE ZONE		
	1A	1B	2
Modulus of Rupture (MOR), [F _b]	0.81	0.89	0.97
Modulus of Elasticity (MOE), [E]	0.92	0.95	0.99
Ultimate Tensile Strength (UTS), [F _t]	0.87	0.94	0.99
Maximum Compressive Strength (MCS), [F _c]	0.81	0.89	0.97
Ultimate Shear Strength (USS), [F _v]	0.78	0.86	0.95
Fasteners/Connectors	0.90	0.90	0.90

¹Climate Zone definitions:

- Zone 1 – minimum design roof live load or maximum ground snow load ≤ 20 psf (960 Pa)
- Zone 1A – Southwest Arizona, Southeast Nevada (Area Bounded by Las Vegas-Yuma-Phoenix-Tucson)
- Zone 1B – All other qualifying areas of the United States
- Zone 2 – Maximum ground snow load > 20 psf (960 Pa)

²Duration of load adjustments for snow loads, 7-day (construction) loads, and wind loads as given in the *National Design Specification[®] for Wood Construction* (NDS) also apply.

<p>TrueFR®</p> <p>Interior Type A High Temperature (HT) Fire Retardant Treated Wood</p> <p>ESR-XXXX KDAT</p> <p>Douglas Fir Year Treater Name--Location</p>	<p>FLAME SPREAD/SMOKE DEVELOPED: ASTM E84/D2768 30 MINUTE TEST: 25 or less</p> <p>ICC-ES & XXX LOGOS HERE</p> <p>MONITORED BY: AA-XXX</p>
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FIGURE 1 – LUMBER STAMPS

DIVISION: 06 00 00 — WOOD, PLASTICS AND COMPOSITES
Section: 06 05 73.13 — Fire-Retardant Wood Treatment

REPORT HOLDER:

ZEROIGNITION TECHNOLOGIES, INC.

EVALUATION SUBJECT:

TRUEFR® FIRE-RETARDANT-TREATED WOOD

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that TrueFR® fire-retardant-treated wood, described in ICC-ES evaluation report [ESR-4521](#), has also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The TrueFR® fire-retardant-treated wood, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4521](#), complies with the LABC Chapter 23, and the LARC Chapter 8, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The TrueFR® fire-retardant-treated wood described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4521](#).
- The design, installation, conditions of use and identification of the TrueFR fire-retardant-treated wood in accordance with the 2021 *International Building Code*® (IBC) and the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report [ESR-4521](#).
- The design and installation are in accordance with additional requirements of LABC Chapter 23, as applicable.

This supplement expires concurrently with the evaluation report, issued June 2024.

DIVISION: 06 00 00 — WOOD, PLASTICS AND COMPOSITES
Section: 06 05 73.13 — Fire-Retardant Wood Treatment

REPORT HOLDER:

ZEROIGNITION TECHNOLOGIES, INC.

EVALUATION SUBJECT:

TRUEFR® FIRE-RETARDANT-TREATED WOOD

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that TrueFR® fire-retardant-treated wood, described in ICC-ES evaluation report ESR-4521, has also been evaluated for compliance with the code(s) noted below.

Applicable code edition(s):

- 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The TrueFR® fire-retardant-treated wood, described in Sections 2.0 through 7.0 of the evaluation report ESR-4521, complies with CBC Chapter 23, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 23, as applicable.

The products have not been evaluated under Chapter 7A for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The TrueFR® fire-retardant-treated wood, described in Sections 2.0 through 7.0 of the evaluation report ESR-4521, complies with CRC Section R802, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Section R802, as applicable.

The products have not been evaluated under CRC Section R337 for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

The products described in this supplement have not been evaluated for compliance with the *International Wildland-Urban Interface Code*® (IWUIC).

This supplement expires concurrently with the evaluation report, issued June 2024.