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ICC-ES Listing Report

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ESL-1021

Reissued 06/2019

This listing is subject to renewal 06/2020.

DIVISION: 09 00 00—FINISHES

SECTION: 09 00 00—FINISHES

REPORT HOLDER:

CHEMCO, INC.

EVALUATION SUBJECT:

**FRX, SAFERWOOD AND THERMEX-FR FIRE-RETARDANT-TREATED
WOOD PRODUCTS**



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ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



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CSI: DIVISION: 09 00 00—FINISHES
Section: 09 00 00—Finishes

Product Listing:

The ICC-ES product-certification system includes evaluating reports of tests of standard manufactured product, prepared by accredited testing laboratories and provided by the listee, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the listee's quality system.

Products: FRX, SAFERWOOD AND THERMEX-FR FIRE-RETARDANT-TREATED WOOD PRODUCTS

Listee: CHEMCO, INC.

Evaluation: Chemco, Inc., FRX, SaferWood and Thermex-FR fire-retardant treated wood were evaluated when tested to the following standard:

- CAN/ULC- S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies, Underwriters Laboratories of Canada.

Findings: Chemco, Inc., FRX, SaferWood and Thermex-FR fire-retardant treated wood have a flame spread rating of 25 or less and a smoke developed classification of 100 or less.

Identification:

1. Lumber and plywood treated with FRX, SaferWood and Thermex-FR fire-retardant chemicals are identified with a label indicating the listee's name (Chemco, Inc.) and address, the product name, the species of the wood treated, the ICC-ES listing report number (ESL-1021) and the ICC-ES listing mark.
2. The report holder's contact information is the following:

CHEMCO, INC.
POST OFFICE BOX 875
FERNDALE, WASHINGTON 98248
(360) 366-3500
www.chemco.org
www.saferwood.com
Info@chemco.org

Installation: The product must be installed in accordance with the Chemco, Inc., instructions.

Models: Structural Grade Southern Pine Lumber, Douglas Fir Lumber, White Spruce Lumber, Western Red Cedar Lumber, Western Hem-fir Lumber, Southern Pine Plywood, Douglas fir Plywood, White Spruce Plywood, Western Red Cedar Plywood and Western Hem-fir Plywood.

Conditions of listing:

1. The listing report addresses only those findings noted above and is applicable to the flame spread rating and smoke developed classification only.
2. Approval is the sole responsibility of the local code official.
3. This listing report applies only to the materials tested and as submitted for review by ICC-ES.
4. FRX, SaferWood and Thermex-FR lumber and plywood are treated in Ferndale, Washington, under a quality control program with inspections by ICC-ES and Fire Tech Services, Inc. (AA-641).

Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.



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

REPORT HOLDER:

CHEMCO, INC.

EVALUATION SUBJECT:

FRX, SAFERWOOD-FX, THERMEX-FR AND MATAVERDE FIRE-RETARDANT-TREATED WOOD PRODUCTS

ADDITIONAL LISTEE:

FSR TREATMENT, INC.

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2018, 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

- Other Codes (see Section 8.0)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics
- Hygroscopic properties
- Corrosion

2.0 USES

Chemco, Inc., FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood are used in interior and exterior applications (exposed to weather, damp or wet locations), as permitted by IBC Section 603.1 and IRC Section R802.

3.0 DESCRIPTION

3.1 General:

The Chemco, Inc., FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood are solid sawn lumber and plywood pressure-impregnated with Chemco's

fire-retardant chemicals in accordance with approved quality control procedures at the facility listed in Section 5.8 of this report.

FRX, SaferWood-FX and Thermex-FR fire-retardant-treated lumber may be one of the following species: structural-grade southern pine, Douglas fir, Spruce-pine-fir, western red cedar, Redwood or western hem-fir. Mataverde fire-retardant-treated lumber includes only structural grade western hem-fir. FRX, SaferWood-FX and Thermex-FR fire-retardant-treated plywood fabricated with face and back veneers of the following species have been evaluated as being fire-retardant-treated wood: structural-grade southern yellow pine, Douglas fir, white spruce, western red cedar or western hem-fir. The plywood is Structural I grade, exterior plywood complying with PS1.

3.2 Flame Spread:

FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated lumber and plywood have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 as modified by Section 2303.2 of the IBC, Section R802.1.5 of the 2018 and 2015 IRC, or Section R802.1.3 of the 2012, 2009, and 2006 IRC.

3.3 Structural Strength:

The structural performance of FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant wood products has been evaluated using ASTM D5516 and D6305 for plywood and ASTM D5664 and D6841 for lumber. The effects of the FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated treatment on the strength of the treated lumber and plywood must be accounted for in the design of wood members and their connections.

3.3.1 Lumber: The strength and stiffness design properties of lumber treated with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant chemicals used in applications at ambient temperatures up to 100°F (38°C) are subject to the design value adjustment factors shown in Table 1.

The strength and stiffness design properties of lumber, when treated with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant chemicals that are subject to elevated temperatures up to 150°F (66°C), are subject to the design value adjustment factors shown in Table 2.

3.3.2 Plywood: The maximum allowable live loads and spans for FRX, SaferWood-FX and Thermex-FR fire-retardant-treated plywood for roof applications given in Table 3 applicable to all species in Section 3.1.

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3.4 Corrosion:

The corrosion rate of the metals specified in Section 2304.10.5 of the 2018 and 2015 IBC, Section 2304.9.5 of the 2012, 2009 and 2006 IBC, Section R317.3 of the 2018, 2015, 2012, and 2009 IRC, or Section R319.3 of the 2006 IRC, in contact lumber treated with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood products, is not increased by the treatment. For interior applications, where there is no potential moisture present, the products described in this evaluation report may be used with uncoated metals. For all other applications, where there is a potential of moisture, the products must be used with coated metals or as otherwise required by the applicable code.

3.5 Hygroscopicity:

FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood products are suitable for interior conditions where sustained relative humidity is 92 percent or less and condensation does not occur.

4.0 DESIGN AND INSTALLATION

4.1 General:

Structural systems that include FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood must be designed and installed in accordance with the applicable code, using the appropriate lumber design value adjustment factors and allowable total sheathing loads as set forth in this section (Section 4.1).

The effects of FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant treatment on the strength of the treated lumber and plywood must be accounted for in the design of wood members and their connections. Ventilation, when required, must be provided in accordance with the applicable code.

The strength and stiffness design properties of lumber, when treated with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant chemicals and used in applications at service temperatures up to 100°F (38°C), are subject to the adjustment factors as set forth in Table 1.

The strength and stiffness design properties of lumber, when treated with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant chemicals and used in applications at service temperatures up to 150°F (66°C), are subject to the adjustment factors as set forth in Table 2.

The allowable load and span properties of plywood, when treated with FRX, SaferWood-FX and Thermex-FR fire-retardant chemicals and used in roof applications at service temperatures up to 170°F (77°C), are subject to the span and load limitations as set forth in Table 3.

4.2 Fasteners:

Fasteners used with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood must be manufactured from the materials specified in Section 2304.10.5 of the 2018 and 2015 IBC, Section 2304.9.5 of the 2012, 2009 and 2006 IBC, Section R317.3 of the 2018, 2015, 2012 and 2009 IRC, or Section R319.3 of the 2006 IRC, and are subject to the design value adjustment factors indicated in Table 1 and Table 2.

5.0 CONDITIONS OF USE

The FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant-treated wood products described in this report

comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The products are manufactured, identified and installed in accordance with this report and the manufacturer's published installation instructions. If there are any conflicts between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 Strength calculations must be subject to the design value adjustment factors and span and load values shown in Tables 1, 2 and 3.
- 5.3 The design value adjustment factors and span and load values given in this report must only be used for unincised dimensional lumber and plywood of the species noted in this report.
- 5.4 The fire-retardant-treated wood must not be used in contact with the ground.
- 5.5 The fire-retardant-treated lumber must not be ripped or milled, since this will alter the surface-burning characteristics and invalidate the flame-spread classification.
- 5.6 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 and 15 percent moisture content for plywood) prior to covering or enclosure by wallboard or other construction materials (except for protection during construction).
- 5.7 The design value adjustment factors for lumber in Tables 1 and 2, and plywood allowable loads and spans in Table 3 of this report, are applicable under elevated temperatures resulting from cyclic climatic conditions. They are not applicable under continuous elevated temperatures resulting from manufacturing or other processes which require special consideration in design, which is not within the scope of this report.
- 5.8 The FRX, SaferWood-FX, Thermex-FR and Mataverde lumber and plywood are treated in Ferndale, WA under a quality control program with inspections by ICC-ES and QAI Laboratories. (AA-635).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fire-retardant-treated Wood (AC66), dated June 2015 (editorially revised April 2018).

7.0 IDENTIFICATION

- 7.1 Lumber and plywood treated with FRX, SaferWood-FX, Thermex-FR and Mataverde fire-retardant chemicals shall be identified by the structural grade mark of an approved agency. In addition, all treated lumber and plywood must be stamped with the name of the inspection agency (QAI Laboratories); the Chemco, Inc. name and address; the name of the fire-retardant treatment; the species of wood treated; the flame-spread and smoke-developed indices; the treating date and method of drying after treatment; and the evaluation report number (ESR-1159). Additionally, the treated lumber and plywood must be identified with the words "Exterior" and/or "Interior" (see Figure 1 for typical labels).

7.2 The report holder's contact information is the following:

CHEMCO, INC.
POST OFFICE BOX 875
FERNDALE, WASHINGTON 98248
(360) 366-3500
www.chemco.org
www.saferwood.com
info@chemco.us

7.3 The Additional Listee contact information is the following:

FSR TREATMENT, INC.
9486 288th STREET
MAPLE RIDGE, BRITISH COLUMBIA V2W 1L1
CANADA

8.0 OTHER CODE

8.1 Evaluation Scope:

In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the 1997 *Uniform Building Code*TM (UBC). The products comply with the UBC as noted below.

8.2 Uses:

See Section 2.0, except use and application must be in accordance with Section 601 of the UBC.

8.3 Description:

See Section 3.0. FRX, SaferWood-FX and Thermex-FR fire-retardant-treated lumber and plywood have a flame-spread index of 25 or less and a smoke developed index of 450 or less when tested in accordance with UBC Standard 8-1 and UBC Section 207.

8.4 Installation:

See Section 4.0, except fasteners must comply with UBC Section 2304.3.

8.5 Conditions of Use:

See Section 5.0.

8.6 Evidence Submitted:

See Section 6.0.

8.7 Identification:

See Section 7.0.

TABLE 1—DESIGN VALUE ADJUSTMENT FACTORS FOR FRX, SAFERWOOD-FX, THERMEX-FR & MATAVERDE FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER [APPLICABLE AT SERVICE TEMPERATURES UP TO 100°F (38°C)]^{1,2}

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

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

²Mataverde fire-retardant-treated lumber only includes western hem-fir lumber species.

TABLE 2—DESIGN VALUE ADJUSTMENT FACTORS FOR FRX, SAFERWOOD-FX, THERMEX-FR & MATAVERDE FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER [APPLICABLE AT SERVICE TEMPERATURES UP TO 150°F (66°C)]¹

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

¹ Mataverde fire-retardant-treated lumber only includes western hem-fir lumber species.

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 FRX, SAFERWOOD-FX AND THERMEX-FR 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	51	-
1 1/8	1530	856	592	375	236	207	127	101	67	39

For SI: 1 inch = 25.4 mm, 1 psf = 47.9 N/m²

NOTES:

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. Tabulated loads for Zone 1B and Zone 2 are based on duration of load adjustment for snow of 1.15.
5. A dead load of 10 psf was used to determine the allowable live loads.
6. Span not to exceed pre-treatment span rating.
7. Chemco does not recommend 5/16" or 3/8" panel thicknesses for roofing applications.

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)



FIGURE 1—TYPICAL LABELS FOR FRX, SAFERWOOD-FX, THERMEX-FR AND MATAVERDE FIRE-RETARDANT LUMBER AND PLYWOOD