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DIVISION: 06—WOOD AND PLASTICS
Section: 06070—Wood Treatment

REPORT HOLDER:

CHEMCO, INC.
POST OFFICE BOX 875
FERNDALE, WASHINGTON 98248
(360) 366-3500
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EVALUATION SUBJECT:

FRX AND THERMEX-FR FIRE-RETARDANT-TREATED WOOD PRODUCTS

ADDITIONAL LISTEE:

JASPER WOOD PRODUCTS
POST OFFICE BOX 2140
37385 JASPER LOWELL ROAD
JASPER, OREGON 97438
(541) 988-1127

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

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

2.0 USES

Chemco, Inc., FRX and Thermex-FR 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, IRC Section R802, or UBC Section 601.

3.0 DESCRIPTION

3.1 General:

The Chemco, Inc., FRX and Thermex-FR 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 facilities listed in Section 5.8 of this report.

FRX and Thermex-FR fire-retardant-treated lumber may be one of the following species: structural-grade southern yellow pine, Douglas fir, white spruce, western red cedar or western hem-fir. FRX and Thermex-FR fire-retardant-treated plywood fabricated with face and back veneers of the following species are recognized 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 and Thermex-FR fire-retardant-treated lumber and plywood have a flame-spread index of 25 and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 (UBC Standard 8-1), as modified by IBC Section 2303.2, IRC R802.1.3 and UBC Section 207.

3.3 Structural Strength:

The structural performance of FRX and Thermex-FR fire-retardant wood products has been evaluated using ASTM D 5516 and D 6305 for plywood and ASTM D 5664 and D 6841 for lumber. The effects of the FRX and Thermex-FR fire-retardant-treated treatment on the strength of the treated lumber must be accounted for in the design of wood members and their connections.

3.3.1 Lumber: The design value adjustments in Table 1 must be used to modify the design values for untreated lumber found in the AF&PA National Design Specification (NDS) Supplement Design Values for Wood Construction, for the applicable species, use and property.

3.3.2 Plywood: The maximum loads and spans given in Table 2 must be used to modify the panel span rating for untreated plywood described in the applicable codes, as determined by thickness and construction. The adjusted loads and spans are applicable to all species in Section 3.1.

3.4 Corrosion:

The corrosion rate of the metals specified in IBC Section 2304.9.5, IRC Section R319.3 or UBC Section 2304.3 in contact lumber treated with FRX and Thermex-FR fire-retardant-treated wood products is not increased by the treatment.

3.5 Hygroscopicity:

FRX and Thermex-FR 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 and Thermex-FR 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 and spans from Tables 1 and 2, respectively, of this report. Ventilation must be provided in accordance with the applicable code.

The wood products listed in Section 3.1 are permitted for interior applications and have been evaluated for structural performance for interior applications where the service temperature does not exceed 100°F (38°C).

4.2 Fasteners:

Fasteners used with FRX and Thermex-FR fire-retardant-treated wood must be manufactured from the materials specified in IBC Section 2304.9.5, IRC Section 319.3 or UBC Section 2304.3, and are subject to the design value adjustment factors indicated in Table 1 of this report.

5.0 CONDITIONS OF USE

The FRX and Thermex-FR 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 ratings shown in Tables 1 and 2, respectively, of this report.
- 5.3 The design value adjustment factors and span ratings 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 and plywood spans in Tables 1 and 2 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 Thermex-FR lumber and plywood are treated at the Chemco facility in Ferndale, Washington, and the Jasper Wood Products LLC facility in Jasper, Oregon, and the FRX lumber and plywood are treated at the Chemco facility in Ferndale, Washington, under a quality control program with inspections by Fire Tech Services, Inc. (AA-641).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fire-retardant-treated Wood (AC66), dated February 2007.

7.0 IDENTIFICATION

Lumber and plywood treated with FRX and Thermex-FR 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 (Fire Tech Services, Inc.); the Chemco, Inc., or Jasper Wood Products LLC 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).

TABLE 1—DESIGN VALUE ADJUSTMENT FACTORS FOR FRX AND THERMEX-FR FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER [APPLICABLE AT TEMPERATURES UP TO 100°F (38°C)]¹

PROPERTY	SOUTHERN YELLOW PINE, WESTERN RED CEDAR	DOUGLAS FIR	WHITE SPRUCE, WESTERN HEM-FIR
Compression parallel to grain	1.0	1.0	0.94
Horizontal shear	0.95	0.95	0.89
Tension parallel to grain	0.76	0.8	0.88
Bending: modulus of elasticity	0.97	1.05	1.09
Bending: extreme fiber stress	0.81	0.99	0.94
Fasteners/connectors	0.90	0.90	0.90

¹Duration of load adjustments for snow loads, seven-day (construction) loads, and wind loads specified in the IBC or UBC, as applicable.

TABLE 2—ALLOWABLE TOTAL LOAD (psf) FOR FRX AND THERMEX-FR FIRE-RETARDANT-TREATED PLYWOOD^{1,2,3,4,5}

CLIMATE ZONE 1A										
PLYWOOD THICKNESS (inch)	PLYWOOD SPAN RATING (AFTER TREATMENT)	SPAN (inches) CENTER-TO CENTER OF SUPPORTS								
		12	16	19.2	24	30	32	36	40	48
¹⁵ / ₃₂ , ¹ / ₂	20/0	164	93	64	41	26	23	-	-	-
¹⁹ / ₃₂ , ⁵ / ₈	24/0	258	145	101	64	41	36	23	-	-
²³ / ₃₂ , ³ / ₄	32/16	324	182	126	81	52	46	29	23	-
CLIMATE ZONE 1B										
PLYWOOD THICKNESS (inch)	PLYWOOD SPAN RATING (AFTER TREATMENT)	SPAN (inches) CENTER-TO CENTER OF SUPPORTS								
		12	16	19.2	24	30	32	36	40	48
³ / ₈	20/0	178	100	69	44	28	25	-	-	-
¹⁵ / ₃₂ , ¹ / ₂	24/0	254	143	99	64	41	36	23	-	-
¹⁹ / ₃₂ , ⁵ / ₈	32/16	398	224	155	100	64	56	35	29	-
²³ / ₃₂ , ³ / ₄	40/20	500	281	195	125	80	70	45	36	25
CLIMATE ZONE 2										
PLYWOOD THICKNESS (inch)	PLYWOOD SPAN RATING (AFTER TREATMENT)	SPAN (inches) CENTER-TO CENTER OF SUPPORTS								
		12	16	19.2	24	30	32	36	40	48
⁵ / ₁₆	20/0	167	94	65	42	27	23	-	-	-
³ / ₈	24/0	258	145	101	65	41	36	23	-	-
¹⁵ / ₃₂ , ¹ / ₂	32/16	369	208	144	92	59	52	32	27	-
¹⁹ / ₃₂ , ⁵ / ₈	40/20	578	325	226	145	93	81	51	42	29
²³ / ₃₂ , ³ / ₄	48/24	726	409	284	182	116	102	65	52	36

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

¹Fastener size and spacing must be as required in the applicable code for untreated plywood of the same thickness.

²Plywood must be Structural I grade, exterior plywood.

³Span ratings meet or exceed the minimum published values (bending) in Table 1 of the APA Load Span Tables for PS-1 Plywood.

⁴Allowable loads in table are based on plywood panel size of (4' by 8') with plywood face grain across (perpendicular to) the supports.

⁵Tabulated 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.

Zone definition:

Zone 1: Where minimum roof live load or maximum ground snow load \leq 20 psf (960 Pa).

Zone 1A: Southwest Arizona, Southeast Nevada (Las Vegas–Yuma–Phoenix–Tucson triangle).

Zone 1B: All other qualifying areas.

Zone 2: Where maximum ground snow load \geq 20 psf (960 Pa).

CHEMCO, INC.
Ferndale, Washington
**FRX Pressure Treated
Fire-Retardant Lumber**
ICC ES Report ESR-1159
Classification: Interior/Exterior
Species:
When tested per ASTM E84 there was no evidence of significant progressive combustion when the test was extended for 30 minutes.
FSI: SDI:
Treated (Month/Year):
Kiln dried after treatment
Fire Tech Services, Inc.
IAS Report No. AA-641

Chemco FRX Lumber

CHEMCO, INC.
Ferndale, Washington
**FRX Pressure Treated
Fire-Retardant Plywood**
ICC ES Report ESR-1159
Classification: Interior/Exterior
Species:
When tested per ASTM E84 there was no evidence of significant progressive combustion when the test was extended for 30 minutes.
FSI: SDI:
Treated (Month/Year):
Kiln dried after treatment
Fire Tech Services, Inc.
IAS Report No. AA-641

Chemco FRX Plywood

CHEMCO, INC.
Ferndale, Washington
**Thermex-FR Pressure Treated
Fire-Retardant Lumber**
ICC ES Report ESR-1159
Classification: Interior/Exterior
Species:
When tested per ASTM E84 there was no evidence of significant progressive combustion when the test was extended for 30 minutes.
FSI: SDI:
Treated (Month/Year):
Kiln dried after treatment
Fire Tech Services, Inc.
IAS Report No. AA-641

Chemco Thermex Lumber

CHEMCO, INC.
Ferndale, Washington
**Thermex-FR Pressure Treated
Fire-Retardant Plywood**
ICC ES Report ESR-1159
Classification: Interior/Exterior
Species:
When tested per ASTM E84 there was no evidence of significant progressive combustion when the test was extended for 30 minutes.
FSI: SDI:
Treated (Month/Year):
Kiln dried after treatment
Fire Tech Services, Inc.
IAS Report No. AA-641

Chemco Thermex Plywood

Jasper Wood Products
Jasper, Oregon
**Thermex-FR Pressure Treated
Fire-Retardant Lumber**
ICC ES Report ESR-1159
Classification: Interior/Exterior
Species:
When tested per ASTM E84 there was no evidence of significant progressive combustion when the test was extended for 30 minutes.
FSI: SDI:
Treated (Month/Year):
Kiln dried after treatment
Fire Tech Services, Inc.
IAS Report No. AA-641

Jasper Lumber

Jasper Wood Products
Jasper, Oregon
**Thermex-FR Pressure Treated
Fire-Retardant Plywood**
ICC ES Report ESR-1159
Classification: Interior/Exterior
Species:
When tested per ASTM E84 there was no evidence of significant progressive combustion when the test was extended for 30 minutes.
FSI: SDI:
Treated (Month/Year):
Kiln dried after treatment
Fire Tech Services, Inc.
IAS Report No. AA-641

Jasper Plywood

FIGURE 1