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Legacy report on the 2000 International Building Code®, the 2000 International Residential Code®, the 2002 Accumulative Supplement to the International Codes™, the BOCA® National Building Code/1999, the 1999 Standard Building Code®, the 1997 Uniform Building Code™ and the 1998 International One and Two Family Dwelling Code®

DIVISION 06—WOOD AND PLASTICS
Section 06070—Wood Treatment

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Universal Forest Products
Western Wood Preserving Company
Mechanic Falls, ME
McMinnville, OR
Hamilton, OH
Sumner, WA

1.0 SUBJECT

FirePro™ Fire Retardant Treated Wood

2.0 PROPERTIES FOR WHICH EVALUATION IS SOUGHT

- 2.1 Flame Spread
2.2 Smoke Development
2.3 Structural Performance
2.4 Corrosiveness
2.5 Hygroscopicity

3.0 DESCRIPTION

3.1 General

FirePro fire retardant treated wood is lumber and plywood pressure impregnated with FirePRO Interior Type A High Temperature (HT) fire retardant chemicals.

FirePRO fire retardant treated wood shall be used in areas not exposed to the weather or wetting where the adopted building code permits the use of wood or fire retardant treated wood.

3.2 Flame Spread

3.2.1 Lumber: FirePRO fire retardant treated lumber of the following species is recognized as having a flame spread rating of 25 or less when subjected to ASTM E 84 tests of 30 minutes duration without evidence of significant progressive combustion:

- Southern Pine
Douglas Fir
Western Hemlock
Alpine Fir
Lodgepole Pine
White Spruce
Spruce-Pine-Fir
Red Spruce
Red Pine
Ponderosa Pine
White Fir
Hem Fir
Balsam Fir
Jack Pine
Engleman Spruce
Black Spruce

3.2.2 Plywood: Plywood fabricated with face and back veneers of the following species and treated with FirePRO fire retardant chemicals is recognized as having a flame spread rating of 25 or less when subjected to ASTM E 84 tests of 30 minute duration without evidence of significant progressive combustion:

Douglas Fir

3.3 Smoke Development

FirePRO fire retardant treated wood of the species listed in Section 3.2 above is recognized as having a smoke development rating of 25 or less when tested in accordance with ASTM E 84.

3.4 Structural Performance

The strength properties of lumber, when treated with FirePRO fire retardant chemicals and properly used in applications where the temperatures do not exceed 180° F (82° C), are subject to the design factors shown in Table 1 of this report.

The strength properties of plywood, when treated with FirePRO fire retardant chemicals and properly used in applications where the temperatures do not exceed 170° F (76° C), are subject to the span limitations shown in Table 2 of this report.

3.5 Corrosion

The corrosivity of FirePRO fire retardant treated wood has been evaluated in accordance with AWPA E12 for a variety of metals. The corrosion rates for carbon steel, galvanized steel, stainless steel, aluminum, red brass and copper are not increased by FirePRO fire retardant chemicals when the treated wood products are used as recommended by the manufacturer and properly sized for the materials selected.

Metal fasteners used in contact with FirePRO fire retardant treated wood shall be carbon steel, galvanized steel, stainless steel, aluminum, red brass, copper, silicon bronze or other suitable fasteners.

ICC-ES legacy 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, Inc., express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



3.6 Hygroscopicity

FirePRO treated lumber and plywood qualify as Interior Type A High Temperature (HT) fire retardant treated wood in accordance with Sections 2.2.2.1 of AWPA C20 and C27, when tested at 92% relative humidity.

4.0 INSTALLATION

Structural systems, which include FirePRO fire retardant treated lumber or plywood, shall be designed and installed in accordance with the adopted building code using the appropriate lumber design adjustment factors and plywood spans from Tables 1 and 2 of this report. Ventilation shall be provided in compliance with the applicable codes.

5.0 IDENTIFICATION

All lumber and plywood treated with FirePRO fire retardant chemicals shall be identified with the grade mark of an approved quality assurance agency, Timber Products Inspection Inc. All lumber and plywood shall, in addition, bear the Underwriters Laboratories Inc. (ULI) stamp, the producer's name and location, the flame spread rating or FR-S designation, and ICC-ES legacy report number NER-577, for field identification (see Figure 1).

6.0 EVIDENCE SUBMITTED

- 6.1 Test report in accordance with ASTM E 84 (UL 723), Report on Treated Lumber under the Classification Program - Osmose, Inc., Buffalo, NY, prepared by Underwriters Laboratories Inc., File R18401, Project 98NK19872, January 6, 2000.
- 6.2 Test report in accordance with ASTM E 84 (UL 723), Report on Treated Plywood under the Classification Program - Osmose, Inc., Buffalo, NY, prepared by Underwriters Laboratories Inc., File R16519, Project 98NK19872, December 14, 2000.
- 6.3 Strength test report for Osmose FirePRO fire retardant treated plywood, Evaluation of FirePRO, a Phosphate-free Fire-retardant formulation, according to ASTM D 5516, prepared by US Forest Products Laboratory, December 1999.
- 6.4 Strength test report for FirePRO fire retardant treated lumber, Evaluation of FirePRO, a Phosphate-free Fire-retardant, Treatment according to ASTM D 5664: Methods A and B - Evaluation of Small Clear Specimens, prepared by US Forest Products Laboratory, March 21, 2000.
- 6.5 Strength test report for FirePRO fire retardant treated lumber, Evaluation of FirePRO, a Phosphate-free Fire-retardant, Treatment according to ASTM D 5664, Method C - Evaluation of a Full-size 2 x 4 Lumber, prepared by US Forest Products Laboratory, January 2000.
- 6.6 Engineering calculations of bending strength design adjustment factors for roof sheathing for FirePRO fire retardant treated plywood, Evaluation of FirePRO According to ASTM D 6305, prepared by McIntyre Associates, Inc., December 3, 2000.
- 6.7 Engineering review of elevated temperature strength data and structural calculations to produce lumber design values and plywood span adjustment tables, prepared by Whitlock Dalrymple Poston & Associates Inc., consulting Engineers, WDP Project No. 06-00055, June 7, 2000, signed and sealed by Christopher L. Galitz, P.E.
- 6.8 Corrosivity test report in accordance with AWPA E12, Corrosion of Metals in Contact with FirePRO Treated Wood, prepared by Timber Products Inspection, TP Project 99-50 B, December 6, 1999.

- 6.9 Corrosivity test report in accordance with AWPA E12 (Modified), Long-term Laboratory Corrosion Tests of Metals in Contact with Wood Treated with Osmose Fire Retardant Formulation FirePRO, prepared by Osmose Research Division, Project NO. 2136-99, November 8, 1999.
- 6.10 Corrosivity test report, Evaluation of Corrosion of Metal Nails Imbedded in Wood Treated with Osmose Fire Retardant Formulation FirePRO, prepared by Osmose Research Division, Project NO. 2095-99, July 15, 1999.
- 6.11 Hygroscopicity test report in accordance with ASTM D 3201, Hygroscopic Properties of Wood Products Treated with Osmose FirePRO Fire retardant, prepared by Timber Products Inspection, TP Project 99-050A, November 11, 1999.
- 6.12 Test reports for Osmose FirePRO fire retardant treated lumber and plywood in accordance with ASTM E 162, Surface Flammability of Materials Determined by ASTM E 162 Radiant Panel Test Method, prepared by Hardwood Plywood and Veneer Association Laboratory and Testing Service, Test Numbers RP-3024 and RP 3025, July 9, 1999.
- 6.13 Test reports for Osmose FirePRO fire retardant treated lumber and plywood in accordance with ASTM E 662, Smoke Density characteristics Determined by ASTM E 662 Test Method, prepared by Hardwood Plywood and Veneer Association Laboratory and Testing Service, Test Numbers S-1463 and S-1464, July 9, 1999.
- 6.14 Smoke toxicity test reports for Osmose FirePRO fire retardant treated lumber and plywood, Acute Inhalation Toxicity of Thermal Degradation Products using the NYS Modified Pittsburgh Protocol, prepared by SGS U.S. Testing Company, Report Numbers 122696-01 and 122696-02, may 1999.
- 6.15 Bioefficacy test report according to AWPA E1, Termite Resistance of Southern Pine Impregnated with FirePRO, prepared by the University of Hawaii, Department of Entomology, April 2000.
- 6.16 Underwriters Laboratories Inc., Follow-Up Service Procedures, File R18401, Volume 1 and File R16519, Volume 1.
- 6.17 Osmose FirePRO Fire Retardant Treated Wood Quality Control Manual, Standard FP-00, January 2001, signed by the licensed producer, Osmose, Inc. and Timber Products Inspection, Inc.

7.0 CONDITIONS OF USE

The ICC-ES Legacy Evaluation Subcommittee on the National Evaluation Reports finds that FirePRO™ FRTW as described in this report complies with or is a suitable alternate to that specified in the 2000 *International Building Code*®, the 2000 *International Residential Code*®, the 2002 *Accumulative Supplement to the International Codes*™, the BOCA® *National Building Code/1999*, the 1999 *Standard Building Code*®, the 1997 *Uniform Building Code*™ and the 1998 *International One and Two Family Dwelling Code*®, subject to the following conditions:

- 7.1 All strength calculations are subject to the design factors and span ratings shown in Table 1 and 2 of this report.
- 7.2 The strength design factors and span ratings given in this report shall only be used for the graded dimensional lumber and plywood of the species noted in this report.
- 7.3 FirePRO interior fire retardant treated wood shall not be exposed to precipitation, direct wetting, or regular condensation, after installation.
- 7.4 FirePRO interior fire retardant treated wood shall not be used in contact with the ground.
- 7.5 FirePRO interior fire retardant treated lumber shall not be ripped or significantly milled, as this will alter the surface burning characteristics and invalidates the flame spread classification. Framing, end cuts, holes, bevel, and joints may be used.

- 7.6 FirePRO interior fire retardant treated lumber shall only be used in areas where the lumber is exposed to temperatures of 180° F (82° C) or less and the plywood is exposed to temperatures of 170° F (76° C) or less.
- 7.7 Exposure to precipitation during shipping, storage or installation shall be avoided. If material does become wet, it shall be replaced or permitted to dry (maximum 19% MC for lumber and 15% MC for plywood) prior to covering or enclosure by wallboard or other construction materials.
- 7.8 The lumber design value adjustments and plywood spans in Table 1 and 2 of this report are applicable under elevated temperatures resulting from cyclic climatic conditions. They are not applicable where the material is exposed to contentious elevated temperatures resulting from manufacturing or other processes which shall require special consideration in design, which is not within the scope of this report.
- 7.9 This report is subject to periodic re-examination. For information on the current status of this report, consult the ICC-ES website.

**TABLE1—STRENGTH DESIGN FACTORS FOR FIREPRO™
FIRE RETARDANT TREATED LUMBER COMPARED TO UNTREATED
LUMBER APPLICABLE TO TEMPERATURE UP TO 180° F (82° C)**

Strength Property	Tested Species			Other Species
	Southern Pine	Douglas Fir	Spruce	
Compression parallel to Grain, F_c	1.00	1.00	1.00	1.00
Tension Parallel to Grain,	0.82	0.83	0.99	0.82
Horizontal Shear	0.97	0.93	0.88	0.88
Modulus of Elasticity, E	0.95	0.99	0.94	0.94
Extreme Fiber Stress in Bending, F_b	0.84	0.97	0.89	0.84

**TABLE 2—FIREPRO™ FIRE RETARDANT TREATED PLYWOOD SPAN RATINGS FOR RATED SHEATHING
APPLICABLE AT TEMPERATURES UP TO 170° F (76° C)**

APA Rating	Panel Thickness (Inches)	FirePRO™ Rating
12/0	$\frac{5}{16}$	12/0
16/0	$\frac{5}{16}, \frac{3}{8}$	16/0
20/0	$\frac{5}{16}, \frac{3}{8}$	20/0
24/0	$\frac{3}{8}, \frac{7}{16}, \frac{1}{2}$	24/0
24/16	$\frac{7}{16}, \frac{1}{2}$	24/16
32/16	$\frac{15}{32}, \frac{1}{2}$	32/16
32/16	$\frac{5}{8}$	32/16
40/20	$\frac{5}{8}, \frac{19}{32}$	32/20
40/20	$\frac{3}{4}, \frac{7}{8}$	40/20
48/24	$\frac{23}{32}, \frac{3}{4}$	48/24
48/24	$\frac{7}{8}$	48/24

Table 2 Notes:

- SI Units conversion: 1 inch = 25.4 mm
- Gluelines shall be exterior and face plies shall be Douglas Fir.
- Allowable uniformly distributed roof load at maximum span for rated sheathing is 30 psf (1426 Pa) for live loads plus 8.5 psf (407 Pa) dead load, and allowable distributed floor load at maximum span is 50 psf (2394 Pa) live load plus 5 psf (239 Pa) dead load, or 200 pounds (890 N) concentrated load in each case.
- Deflection criteria for treated plywood is 1/180 of span.
- The $\frac{5}{16}$ inch and $\frac{3}{8}$ inch thick (7.9 mm or 9.5 mm) panels are not permitted for roofing applications.
- Reduction factors provided are based on environmental temperature and relative humidity as expected from cyclic climatic conditions in the continental United States for roof sheathing applications. Other conditions, such as industrial processing, which would expose the sheathing treated with FirePRO to elevated temperatures and or humidity, are beyond the scope of this report.
- For roof sheathing applications in the geographic area located inside a line represented by Las Vegas, Yuma, Phoenix and Tucson, the designated roof sheathing spans shall be reduced by 2 inches (51 mm).

FIGURE 1—TYPICAL FIREPRO™ FIRE RETARDANT TREATED WOOD STAMP DESIGNS

