

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

described in this report, including the Conditions of Use stated in Section 6.

REPORT HOLDER:
TOMBALL FOREST LTD
42511 OLD HOUSTON HWY
WALLER, TX 77484
281-351-9109

REPORT SUBJECT:
FireChief Fire-Retardant-Treated Wood

3.0 DESCRIPTION

3.1 FireChief: Fire-retardant-treated lumber and plywood pressure treated with FireChief water-based interior fire retardant. FireChief products are kiln dried after treatment to a moisture content of 19 percent for lumber and 15 percent for plywood. Solid dimensional lumber ranging from 2 × 4 to 2 × 16 inches in SPF, Southern Pine, Douglas Fir, and Other Wood species as #2 and higher grades. Structural plywood ranging from 15/32 to 1-1/8 inches C-D Exposure 1 and higher grades.

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2015, 2012, and 2009 *International Building Code*® (IBC)
- 2015, 2012, and 2009 *International Residential Code*® (IRC)

NOTE: This report references 2015 Code sections with [2012] and [2009] Code sections shown in brackets where they differ.

1.2 FireChief fire-retardant-treated wood has been evaluated for the following properties (see Table 1):

- Surface burning characteristics
- Strength reduction
- Hygroscopicity
- Corrosion
- Fire resistance

1.3 FireChief has been evaluated for the following uses (see Table 1):

- Where the Code permits wood or fire-retardant treated wood
- Interior applications

2.0 STATEMENT OF COMPLIANCE

FireChief fire-retardant-treated wood complies with the Codes listed in Section 1.1, for the properties stated in Section 1.2, and uses stated in Section 1.3, when installed as

4.0 PERFORMANCE CHARACTERISTICS

4.1 Surface Burning Characteristics: FireChief treated lumber and plywood has a flame spread index of 25 or less and smoke developed index of 450 or less when tested in accordance with ASTM E84; exhibits no evidence of significant progressive combustion when continued for an additional 20-minute period and the flame front progression is less than 10-1/2 feet. Refer to Section 2303.2 of the IBC and Section R802.1.5 [R802.1.3] of the IRC. FireChief treated lumber and plywood complies with ASTM E2768.

4.2 Strength Reduction: Span ratings and total allowable loads for treated plywood in roof sheathing and subfloor applications are provided in Table 2. Roof sheathing is recognized for temperatures up to 170°F (77°C).

Adjustment factors for treated lumber when used at or near room temperatures and for service temperatures to 150°F are provided in Tables 3 and 4, respectively.

The performance of FireChief fire-retardant-treated plywood has been evaluated to ASTM D5516 and lumber has been evaluated to ASTM D5664. Plywood maximum span ratings and allowable loads have been developed in accordance with ASTM D6305. Lumber treatment adjustment factors have been developed in accordance with ASTM D6841. The base design values for untreated



lumber are published in ANSI/AWC NDS-2015 *National Design Specification (NDS) for Wood Construction 2015 Edition*.

4.2.1 Plywood Shear Walls: FireChief treated plywood may be used as a component of a shear wall following the AWC Special Design Provisions for Wind and Seismic (SDPWS) Section 4.2 and 4.3, or IBC Sections 2306.2 and 2306.3, provided, in either case, the nominal panel thickness is increased by 1/8 inch for the tabulated allowable shear values.

4.3 Hygroscopicity: Moisture content of FireChief treated wood is less than 28 percent when tested at 92 percent relative humidity in accordance with ASTM D3201 and is therefore suitable for interior conditions. Refer to Section 2303.2.7 of the IBC and Section R802.1.5.9 [R802.1.3.7] of the IRC.

4.4 Corrosion: The corrosion rate of hot-dipped galvanized fasteners in contact with FireChief treated wood used in interior applications is evaluated in accordance with AWPA E12 and ICC-ES AC326.

4.5 Fire-Resistance-Rated Walls: FireChief treated lumber and plywood have been tested in accordance with ASTM E119 as components of fire-resistance-rated wall assemblies for 1 hour and 2 hour ratings. See Intertek Design Listings FRCT/FRWT 60-01, FRCT/FRWT 60-02, FRCT/FRWT 120-01, and FRCT/FRWT 120-02 in the Intertek Listing Report "[Tomball Forest Ltd. – FireChief Fire Retardant Wood](#)" on the Intertek Directory of Building Products.

4.5.1 One-Hour Wall Assembly: When used in Type III, Type IV, and Type V construction, 1 hour fire-resistance-rated assemblies incorporating FireChief treated wood studs and plywood must be as described in [Intertek Design Listing TFL/FRWT 60-01 and 60-02](#). The design values for the studs must be adjusted in accordance with Table 3 for service temperatures to 100°F (38°C). The allowable spans for the plywood must be in accordance with the spans listed in Table 2 for FireChief wall/subfloor.

4.5.2 Two-Hour Wall Assembly: When used in Type III, Type IV, and Type V construction, 2 hour fire-resistance-rated assemblies incorporating FireChief treated wood studs and plywood must be as described in [Intertek Design](#)

[Listing TFL/FRWT 120-01 and 120-02](#). The design values for the studs must be adjusted in accordance with Table 3 for service temperatures to 100°F (38°C). The allowable spans for the plywood must be in accordance with the spans listed in Table 2 for FireChief wall/subfloor.

5.0 INSTALLATION

5.1 General:

FireChief treated lumber and plywood must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Application:

Exposure to precipitation during storage or installation shall be avoided. If material does become wet, it shall 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).

Fasteners, including nuts and washers, shall be hot-dipped galvanized in accordance with FireChief's published installation instructions.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 All strength calculations shall be subject to the design value adjustment factors or span ratings shown Tables 2 through 4, and only be used for unincised dimensional lumber and plywood of the species noted in this report.

6.3 FireChief treated lumber shall not be ripped or milled as this will alter the surface-burning characteristics and invalidate the flame spread classification. Framing end cuts and holes are permitted.





6.4 FireChief treated lumber and plywood shall not be used in contact with the ground.

6.5 The values in Tables 2 through 4 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 shall require special consideration in design, which is not within the scope of this report.

6.6 FireChief treated lumber and plywood is manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

- 5. Method of drying and statement of conformance with applicable Code referenced standards;
- 6. The Code Compliance Research Report Number (CCRR-0284); and
- 7. The Intertek Mark as shown below.



7.0 SUPPORTING EVIDENCE

7.1 Data in accordance with the ICC-ES Acceptance Criteria Fire Retardant Treated Wood (AC66), Approved June 2015.

7.2 Reports of testing and analysis in accordance with ASTM D5516, D6305, D5664, D3201, E84, E2768, and AWPA E12.

7.3 Intertek Listing Report "Tomball Forest Ltd. – FireChief Retardant Wood", on the [Intertek Directory of Building Products](#).

8.0 IDENTIFICATION

FireChief treated lumber and plywood must bear the structural grade mark of an approved agency. In addition, labeling is provided on each plywood panel and lumber piece with the following information:

- 1. The product name (FireChief);
- 2. Name and address of the treater;
- 3. Species of wood treated;
- 4. Flame spread and smoke-developed indices;

9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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TABLE 1 – Properties Evaluated

Property	2015 IBC Section ⁽¹⁾	2015 IRC Section ⁽¹⁾
Surface burning characteristics	2303.2	R802.1.5
Strength adjustments for plywood	2303.2.5.1	R802.1.5.6
Strength adjustments for lumber	2303.2.5.2	R802.1.5.7
Hygroscopicity	2303.2.7	R802.1.5.9
Corrosion	2304.10.5.4	R317.3.4
Fire resistance	703.2	R302

(1) Section numbers may be different for earlier versions of the International codes.

TABLE 2 – FireChief Treated Plywood Maximum Spans and Allowable Loads

Performance Category	Untreated Span Rating	Treated Plywood				
		Maximum Span ⁽⁴⁾ (in.)	Roof Sheathing			Subfloor Maximum Span ⁽⁵⁾ (in.)
			Total Allowable Loads ^(1, 2, 3) (psf)			
			Climate Zone			
		1A	1B	2		
15/32, 1/2	32/16 ⁽⁶⁾	24	29	43	60	16
19/32, 5/8	40/20 ⁽⁶⁾	24	49	73	103	20
		32	28	42	58	
23/32, 3/4	48/24 ⁽⁷⁾	32	40	60	84	24
		48	18	26	37	
7/8	60/32 ⁽⁷⁾	48	30	44	63	-
1-1/8	60/48 ⁽⁷⁾	48	30	44	63	-

(1) Load and span ratings developed in accordance with ASTM D5516 and calculated in accordance with ASTM D6305.

(2) The total allowable load is the sum of the live and dead loads at maximum span.

(3) Uniform load deflection limitations 1/180 of span under live load plus dead load, 1/240 under live load only.

(4) For roof slopes less than 3:12, the next panel thickness greater than required for the span shall be specified.

(5) Limited to 100 psf maximum live load.

(6) Plywood conforming to US DOC PS 1 or PS 2 minimum of 4 plies.

(7) Plywood conforming to US DOC PS 1 or PS 2 minimum of 5 plies.





TABLE 3 – FireChief Treated Lumber Adjustment Factors When Used at or Near Room Temperatures

Property	Lumber Treatment Adjustment Factors ^(1, 2)			
	SPF	Southern Pine	Douglas Fir	Other Wood Species
Bending MOR	0.96	0.82	1.00	0.82
Bending MOE	0.93	0.87	0.99	0.87
Tension Parallel to Grain	1.00	0.98	1.00	0.98
Shear Parallel to Grain	1.00	0.95	1.00	0.95
Compression Parallel to Grain	0.96	0.96	0.96	0.96
Compression Perpendicular to Grain ⁽³⁾	0.95	0.95	0.95	0.95
Fasteners / connectors ⁽⁴⁾	0.90	0.90	0.90	0.90

- (1) Results of matched treated and untreated tests after conditioning at nominal room temperatures (72°F) for service temperatures up to 100°F
- (2) Treatment adjustment factors for test data developed in accordance with ASTM D5664 and calculated in accordance with ASTM D6841.
- (3) Compression Perpendicular assigned according to ASTM D6841 section 9.5
- (4) Fastener/connection assigned according to ASTM D6841 section 9.6

TABLE 4 – FireChief Treated Lumber Adjustment Factors for Service Temperatures to 150°F

Property	Lumber Treatment Adjustment Factors ⁽¹⁾											
	SPF			Southern Pine			Douglas Fir			Other Wood Species		
	Climate Zone											
	1A	1B	2	1A	1B	2	1A	1B	2	1A	1B	2
Bending MOR	0.91	0.93	0.95	0.81	0.81	0.81	1.00	1.00	1.00	0.81	0.81	0.81
Bending MOE	0.96	0.96	0.96	0.88	0.88	0.88	1.00	1.00	1.00	0.88	0.88	0.88
Tension Parallel to Grain	0.93	0.96	0.99	0.93	0.96	0.99	1.00	1.00	1.00	0.93	0.96	0.99
Shear Parallel to Grain	0.93	0.96	0.99	0.88	0.91	0.94	1.00	1.00	1.00	0.88	0.91	0.94
Compression Parallel to Grain	0.88	0.91	0.94	0.89	0.92	0.95	0.96	0.96	0.96	0.89	0.92	0.95
Compression Perpendicular to Grain ⁽²⁾	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Fasteners / connectors ⁽³⁾	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

- (1) Treatment adjustment factors for test data developed in accordance with ASTM D5664 and calculated in accordance with ASTM D6841
- (2) Compression Perpendicular assigned according to ASTM D6841 section 9.5
- (3) Fastener/connection assigned according to ASTM D6841 section 9.6

