UL Evaluation Report

UL ER7002-01

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UL Category Code: ULET

CSI MasterFormat®

DIVISION: 06 00 00 – Wood, Plastics, and Composites
Sub-level 2: 06 05 00 – Common Work Results for Wood, Plastics, and Composites
Sub-level 3: 06 05 73 – Wood Treatment
Sub-level 4: 06 05 73.13 – Fire-Retardant Wood Treatment

COMPANY:

Hoover Treated Wood Products, Inc.
154 Wire Road
Thomson, Georgia 30824
(706) 595-7355
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1. SUBJECT:

PYRO-GUARD® FIRE-RETARDANT-TREATED WOOD

2. SCOPE OF EVALUATION

- 2018, 2015 and 2012 *International Building Code*® (IBC)
- 2018, 2015 and 2012 *International Residential Code*® (IRC)
- 2018 *International Mechanical Code*® (IMC)

The products were evaluated for the following properties:

- Fire Resistance
- Surface Burning
- Structural Performance
- Hygroscopicity
- Thermal Barrier – Roof and Floor Applications
- Durability and Corrosion of Metals Contacting Fire-Retardant-Treated (FRT) Lumber and Plywood

3. REFERENCED DOCUMENTS

- ANSI/UL 263 (ASTM E119) Fire Tests of Building Construction and Materials, Fourteenth Edition with revisions through January 2019
- ANSI/UL 723 (ASTM E84), Standard for Test for Surface Burning Characteristics of Building Materials, Eleventh Edition with revisions through April 2018
- ANSI/UL 790 (ASTM E108), Standard Test Methods for Fire Tests of Roof Coverings, Eighth Edition with revisions through October 2018
- ANSI/UL 1897 Uplift Tests for Roof Covering Systems, Seventh Edition with revisions through September 2015
- ANSI/AWC NDSI-2018 National Design Specification (NDS) for Wood Construction
- ANSI/AWC NDSI-2015 National Design Specification (NDS) for Wood Construction
- ANSI/AWC NDSI-2012 National Design Specification (NDS) for Wood Construction
- ASTM D3201-13 and -08a, Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products
- ASTM D5516-09 and -03, Standard Test Method for Evaluating Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures
- ASTM D5664-10 and -08, Standard Test Method for Evaluating Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant-Treated Lumber
- ASTM D6305-08, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing
- ASTM D6841-08, Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber
- NFPA 13-16, Standard for Installation of Sprinkler Systems
- NFPA 101-18, Life Safety Code
- NFPA 5000-18, Building Construction and Safety Code
- NFPA 285-17, Standard Fire Test for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Assemblies Containing Combustible Components

4. USES

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood is intended for use in interior applications not exposed to wetting where permitted in the code.

5. PRODUCT DESCRIPTION

5.1 General:

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood is lumber and plywood that has been impregnated with the PYRO-GUARD® chemical by a pressure process to reduce combustibility. PYRO-GUARD® Fire-Retardant-Treated (FRT) lumber and plywood are intended for interior use only. PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood is kiln-dried after treatment to moisture contents of 19 percent for lumber and 15 percent for plywood, as required in Section 2303.2.8 of the 2018, 2015 and 2012 IBC, Section R802.1.5.10 of the 2018 IRC, Section R802.1.5.9 of the 2015 IRC, and Section R802.1.3.8 of the 2012 IRC.

5.2 Material Species:

The following species of PYRO-GUARD® treated lumber and plywood are covered under this report:

Lumber: Alpine Fir, Balsam Fir, Black Spruce, Douglas Fir, Engelmann Spruce, Hem-Fir, Western Hemlock, Jack Pine, Lodgepole Pine, Ponderosa Pine, Red Spruce, Southern Pine, Spruce-Pine-Fir (SPF), White Fir, White Spruce

Plywood: Douglas Fir, Lauan, and Southern Pine

5.3 Fasteners:

Metallic fasteners, fastening devices or components contacting PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood products shall comply with Section 2304.10.5 of the 2018 and 2015 IBC, Section 2304.9.5 of the 2012 IBC, and Section R317.3.4 of the 2018, 2015 and 2012 IRC, or be made from metals listed in section 5.5 of this report. Use of uncoated carbon steel fasteners is permitted within the weather-protected building envelope when not exposed to damp or wet conditions.

Refer to Table 2 and Table 3 for adjustment factors for design and minimum fastener size.

5.4 Surface Burning Characteristics:

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood covered under this report has a flame spread index of 25 or less and a smoke developed index of 450 or less, when tested in accordance with ANSI/UL 723 (ASTM E84) and did not show any evidence of significant progressive combustion when the test was continued for an additional 20-minute period. The flame front did not progress more than 10½ feet beyond the centerline of the burners at any time during the test. See Section 2303.2 of the 2018, 2015 IBC and the 2012 IBC, and Section R802.1.5 of the 2018 and 2015 IBC and Section R802.1.3 of the 2012 IRC.

Refer to Section 8.5 for the UL Certification of PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood for surface burning characteristics.

5.5 Corrosivity:

Corrosion rates for aluminum, carbon steel, copper, galvanized steel, and red brass components in contact with PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood are not enhanced by the PYRO-GUARD® chemical treatment when used in assemblies when the manufacturer's instructions are followed.

5.6 Hygroscopicity:

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood has a moisture content of less than 28 percent when tested in accordance with ASTM D3201 at 92 percent relative humidity, as specified in Section 2303.2.7 of the 2018, 2015 and 2012 IBC, Section R802.1.5.9 of the 2018 and 2015 IRC, and Section R802.1.3.7 of the 2012 IRC.

6. DESIGN & INSTALLATION

6.1 General:

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood must be designed and installed in accordance with the applicable codes and certifications referenced in this report, and the manufacturer's published installation instructions. Building construction elements supporting PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood must be designed in accordance with the standards referenced in the applicable code. For codified design and installation uses in addition to those mentioned below, refer to Table 1.

6.2 Structural Properties:

The lumber and plywood wood species listed in Section 5.2 of this report have been evaluated for structural performance for use in interior assemblies exposed to elevated temperatures due to cyclic climatic conditions. Excluded from the scope of this report are evaluations on the wood species intended for assemblies whose end-use includes exposure to continuous elevated temperatures. Proper use of lumber design values, adjustment factors, and plywood span ratings from Table 2 and Table 3 are to be employed.

6.2.1 Treated Plywood

The effects of treatment and re-drying, and exposure to high temperature and high humidity on the structural properties of PYRO-GUARD® FRT plywood have been evaluated in accordance with ASTM D5516 as required by Section 2303.2.5.1 of the 2018, 2015 and 2012 IBC, Section R802.1.5.6 of the 2018 and 2015 IRC, and Section R802.1.3.5.1 of the 2012 IRC. This data was used to develop adjustment factors for untreated plywood design values in accordance with ASTM D6305.

Plywood manufactured from Southern pine and Douglas Fir has been evaluated for structural performance for use in roof sheathing applications having service temperatures to 170°F. Refer to Table 2 for load span limitations.

6.2.2 Treated Lumber

The base design values found in the applicable National Design Specification (NDS) and NDS Supplement: Design Values for Wood Construction require adjustment to account for the fire-retardant treatment. The effects of treatment and re-drying, and exposure to high temperature and high humidity on the structural properties of PYRO-GUARD® FRT lumber has been evaluated in accordance with ASTM D5664 as required by Section 2303.2.5.2 of the 2018, 2015 and 2012 IBC, Section R802.1.5.7 of the 2018 and 2015 IRC, and Section R802.1.3.5.2 of the 2012 IRC. This data was used to develop modification factors for each species of PYRO-GUARD® FRT lumber in accordance with ASTM D6841.

Dimensional lumber manufactured from Southern pine, Douglas Fir, and other species listed in Section 5.2 has been evaluated for use as structural wall and floor framing members having service temperatures up to 100°F. Refer to Table 3 for applicable design value adjustment factors.

Dimensional lumber manufactured from Southern pine and Douglas Fir has been evaluated for use as structural roof framing members having service temperatures up to 150°F. Refer to Table 3 for applicable design value adjustment factors.

6.3 Fire Resistance:

PYRO-GUARD® Fire-Retardant-Treated (FRT) wood has been evaluated for fire resistance in accordance with Section 703.2 of the 2018, 2015 and 2012 IBC, Section R302.1 of the 2018, 2015 and 2012 IRC, and ANSI/UL 263 (ASTM E119-15) when used as a part of UL Fire Resistance Designs V314 and V332.

Refer to section 8.4 of this report for the UL Certification of PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood for fire resistance assembly designs.

6.4 Roofing:

PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood for use in roofing assemblies has been evaluated in accordance with ANSI/UL 790 (ASTM E108) and by Section 1505.1 of the 2018, 2015 and 2012 IBC, Section R902.1 of the 2018, 2015 and 2012 IRC. In addition, PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood has been evaluated in accordance with ANSI/UL 1897 and Section 1504.3.1 of the 2018, 2015 and 2012 IBC.

Refer to sections 8.6 and 8.7 of this report for the UL Certification of PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood for roofing applications.

Minimum $^{15}/_{32}$ inch thick PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood may be used as a thermal barrier to protect foam plastic insulation as described in Section 2603.4.1.5 of the 2018, 2015 and 2012 IBC, Section R316.5.2 of the 2018, 2015 and 2012 IRC.

Use of PYRO-GUARD® Fire-Retardant-Treated (FRT) lumber and plywood in non-vented roofing assemblies is prohibited.

Refer to Table 2 for load span limitations.

6.5 Flooring:

Minimum $^{15}/_{32}$ inch thick PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood may be used as a thermal barrier to protect foam plastic insulation as described in Section 2603.4.1.14 of the 2018, 2015 and 2012 IBC, and Section R316.5.13 of the 2018, 2015 and 2012 IRC when the foam plastic insulation is exposed to the interior of the building. Refer to Table 2 for load span limitations.

6.6 Plywood Diaphragms and Shear Walls:

Wood-frame diaphragms are to be designed and constructed in accordance with Section 2306.2 of the 2018, 2015 and 2012 IBC.

Wood-frame shear walls are to be designed and constructed in accordance with Section 2306.3 of the 2018, 2015 and 2012 IBC.

When used, the thickness of PYRO-GUARD® Fire-Retardant-Treated (FRT) Plywood is to be increased by $^{1}/_{8}$ inch for the allowable shear values in Section 4.2 or 4.3 of AWC Special Design Provisions for Wind and Seismic (SDPWS) or as shown in Sections 2306.2 and 2306.3 of the 2018, 2015 and 2012 IBC. As an alternate, design capacities for plywood shall be reduced to 90% of the allowable values prescribed in the applicable code when treated with PYRO-GUARD®. The span rating shall be as noted as per the evaluation report.

6.7 Exterior Walls Containing Combustible Components:

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood has been evaluated as a window system component of UL Classified Exterior Wall Systems for use in exterior non-load-bearing wall assemblies containing combustible components in accordance with NFPA 285 as required by Section 2603.5 of the 2018, 2015 and 2012 IBC. Refer to section 8.6 of this report for the UL Certification of PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood for exterior wall system designs noted below.

FWFO.EWS0021 FWFO.EWS0024 FWFO.EWS0027 FWFO.EWS0030 FWFO.EWS0045

7. CONDITIONS OF USE

7.1 General:

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood products described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 2 of this report, subject to the following conditions:

7.2 Materials and methods of installation shall comply with this report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this report, this report governs.

7.3 Where required by the building official, engineering calculations and details shall be provided. The calculations shall verify that the anchorage complies with the building code for the type of framing and condition of the supporting construction.

7.4 The engineering calculations are subject to the adjustment factors and span ratings in Table 2 and Table 3 used for lumber and plywood of those species noted herein.

7.5 PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood must not be used in contact with the ground or any application in which it will be permanently exposed to precipitation, direct or indirect wetting, condensation, or in an unvented roofing or roofing support assembly.

7.6 PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood may be field cut or ripped in any direction.

7.7 PYRO-GUARD® Fire-Retardant-Treated (FRT) lumber must not be milled or ripped in the field. However, bevels, end cuts, joints, laps, and scarfs may be fabricated.

7.8 PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood is manufactured by Hoover Treated Wood Products, Inc. under the UL LLC Listing/Classification and Follow-Up Service Program, which includes inspections for quality. Hoover's manufacturing locations covered by this report are located in:

- Bakersfield, CA
- Detroit, MI
- Milford, VA
- Oxford, PA
- Pine Bluff, AR
- Thomson, GA
- Winston, OR
- Havana, FL

7.8.1 In addition, PYRO-GUARD® solution is a recognized component which may be used, and is under the above mentioned surveillance programs by the following applicators:

Eastex Forest Products
Hartwick Road
Houston, TX
281-442-2591

Jasper Wood Products
37385 Jasper Lowell Road
Fall Creek, OR 97438
541-988-1127

8. SUPPORTING EVIDENCE

8.1 Manufacturer's descriptive product literature, including installation instructions.

8.2 See UL, LLC's Product iQ™ database for Fire-resistance Ratings in accordance with ANSI/UL 263, Building Units (BZXX), and Framing Members (CIKV).

8.3 See UL, LLC's Product iQ™ database for Surface Burning Characteristics in accordance with ANSI/UL 723, Treated Lumber (BPVV), and Treated Plywood (BUGV).

8.4 See UL, LLC's Product iQ™ database for Roofing Systems UL Classified in accordance with ANSI/UL 790 (TGFU).

8.5 See UL, LLC's Product iQ™ database for Roofing Systems, Uplift Resistance UL Classified in accordance with ANSI/UL 1897 (TGIK).

8.6 See UL, LLC's Product iQ™ database for components used in Exterior Wall Systems UL Classified in accordance with ANSI/NFPA 285 (FWFO).

8.7 Reports in accordance with ASTM D3201, Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products

8.8 Reports in accordance with ASTM D5516, Standard Test Method for Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures

8.9 Reports in accordance with ASTM D5664, Standard Test Method for Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant-Treated (FRT) Lumber

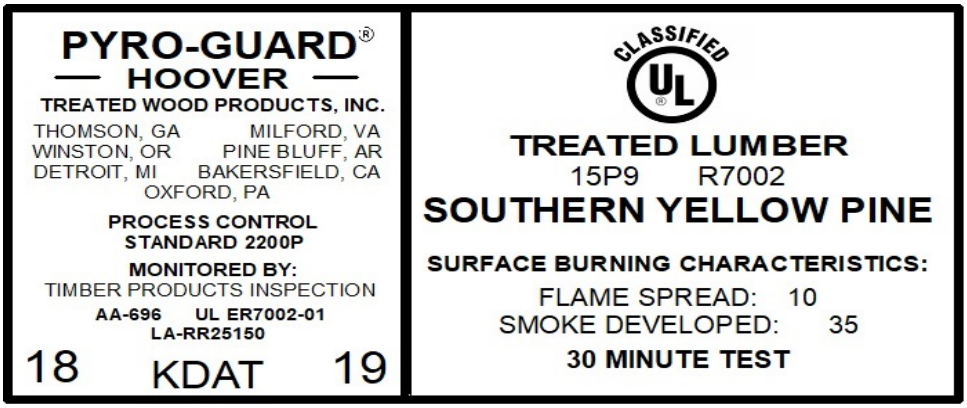
8.10 Reports in accordance with ASTM D6305, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing

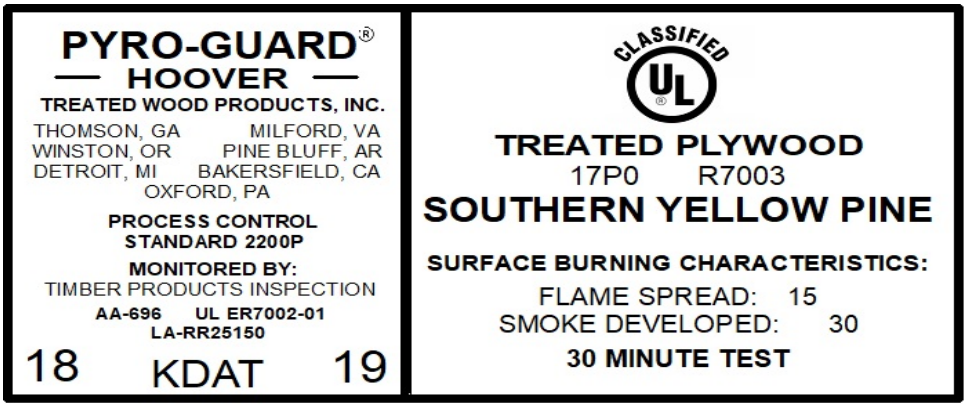
8.11 Reports in accordance with ASTM D6841, Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber

9. IDENTIFICATION

PYRO-GUARD® Fire-Retardant-Treated (FRT) Wood described in this evaluation report is identified by a marking bearing:

- The report holder's name, Hoover Treated Wood Products, Inc.
- The UL Listing/Classification Mark
- The plant identification
- The evaluation report number UL ER7002-01





The validity of the evaluation report is contingent upon this identification appearing on the product or product label or UL Listing/Classification Mark/Certification Mark.

10. USE OF UL EVALUATION REPORT

10.1 The approval of building products, materials or systems is under the responsibility of the applicable authorities having jurisdiction.

10.2 UL Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL.

10.3 The status of this report, as well as a complete directory of UL Evaluation Reports may be found at UL.com via the Product iQ™ database.

Table 1

USES OF FIRE-RETARDANT-TREATED WOOD	IBC 2012 Ed.	NFPA 5000 2012 Ed.	NFPA 101 2012 Ed.	IBC 2015 Ed.	NFPA 5000 2015 Ed.	NFPA 101 2015 Ed.	IBC 2018 Ed.	NFPA 5000 2018 Ed.	NFPA 101 2018 Ed.
Architectural trim, exterior wall coverings	1406.2.1	37.2.1	*	1406.2.1#3	37.2.1	*	1405.1.1#3	37.2.1	*
Attics: Sprinklers not required in residential occupancies							903.3.1.2.3	See occupancy chapters	
Awnings & canopies	3105.3	32.4.2.1(3)	*	3105.3	32.4.2.1(3)	*	3105.2	32.4.2.1(3)	*
Balconies, porches, decks, and exterior stairways	1406.3	37.2.2.2	*	1406.3	37.2.2.2	*	603.1#1.4	37.2.2.2	*
Bay and oriel windows	1406.4	37.2.2.1	*	1406.4	37.2.2.1	*	705.2.4	37.2.2.1	*
Children playground structures in malls	424.2#1			424.2#1			424.2#1		
Combustible projections	705.2.3	37.2	*	705.2.3	37.2	*	705.2.3	37.2	*
Exterior bearing & nonbearing walls: Type III const.	602.3	7.2.4.2.1	4.4.2.1[1]	602.3	7.2.4.2.1	4.4.2.1[1]	602.3	7.2.4.2.1	4.4.2.1[1]
Exterior bearing & nonbearing walls: Type IV const.	602.4	7.2.5.6.7	4.5.6.7[1]	602.4.1	7.2.5.6.7	4.5.6.7[1]	602.4.1	7.2.5.6.7(3)	4.5.6.7[1]
Exterior nonbearing walls in Types I & II construction	603.1#1.2	7.2.3.2.12.1	4.3.2.12.1[1]	603.1#1.2	7.2.3.2.12.1	4.3.2.12.1[1]	603.1#1.2	7.2.3.2.12.1	4.3.2.12.1[1]
Enclosed combustible spaces in sprinklered buildings of all types of construction: Sprinklers not required	**NFPA 13**: 1999: 8-13.1.1#9; 2002: 8.14.1.2.11; 2007-2016: 8.15.1.2.11; 2019: 9.2.1.12								
Fire barrier: See partitions Types I & II construction	603.1#1.1	7.2.3.2.11.2	4.3.2.11.2[1]	603.1#1.1	7.2.3.2.11.2	4.3.2.11.2[1]	603.1#1.1	7.2.3.2.11.2	4.3.2.11.2[1]
Fuel dispensing station (marine and motor vehicle)	406.7.2	32.4.5.2	*	406.7.2	32.4.5.2	*	406.7.2	32.4.5.2	*
Grandstands: Allowable areas increased								32.7.5.2(5)	12.4.9.3.3
Grandstands: Allowable heights increased		32.7.5.4	12.4.8.3.3		32.7.5.4	12.4.8.3.3		32.7.5.4	12.4.9.3.6
Interior finish with flame spread index ≤ 25 (Class A)	803.1.1	10.3.2.1	10.2.3.4(1)	803.1.1	10.3.2.1	10.2.3.4(1)	803.1.2	10.2.3.3(1)	10.2.3.3(1)
Kiosks in covered or open mall buildings	402.6.2	27.4.4.12.1	36.4.4.8(1)	402.6.2	27.4.4.12.1	36.4.4.8(1)	402.6.2#1.1	27.4.4.13.1(1)	36.4.4.11(1)(a)
Liquid storage rooms (shelving, racks, and wainscotting)				415.11.5.2#3	9.3.6[3]	9.3.6[3]	415.11.5.2#3	9.3.4[3]	*
Mechanical equipment screens							1510.6.2#2		
Parapet not required: FRTW sheathing:									
Exterior walls	705.11#5	37.1.3.1	*	705.11#5.1	37.1.3.1	*	705.11#5.1	37.1.3.1(6)(b)	*
Fire and party walls in Types III, IV, and V	706.6#4.3	8.3.3.7.5.2	6.6.4.1[2]	706.6#4.3	8.3.3.7.4.2	6.6.4.1[2]	706.6#4.3	8.3.3.7.4.2	6.6.4.2[2]
Townhouses: Exterior and common wall use within 4ft of such walls	**Intl. Residential Code:** R302.2.2	22.5.4	*	**Intl. Residential Code:** R302.2.2	22.5.4	*	**Intl. Residential Code:** R302.2.4	22.5.4	*
Partitions (2 hr. or less) in Types I & II construction	603.1#1.1	7.2.3.2.11.2	4.3.2.11.2[1]	603.1#1.1	7.2.3.2.11.2	4.3.2.11.2[1]	603.1#1.1	7.2.3.2.11.2	4.3.2.11.2[1]
Partitions (fixed) establishing corridors in buildings with one tenant serving less than 30 people	603.1#11	7.2.3.2.11.2	*	603.1#11	7.2.3.2.11.2	*	603.1#11	7.2.3.2.11.2	*
Pedestrian walkways	3104.3#2	7.2.3.2.9.2	*	3104.3#2	7.2.3.2.9.2	*	3104.3#2		*
Platforms in Types I, II, and IV construction	410.4	7.2.3.2.7	4.3.2.7[1]	410.4	7.2.3.2.7	4.3.2.7[1]	410.3	7.2.3.2.7	4.3.2.7[1]
Plenums in all types of construction	**Intl. Mechanical Code:** 602.2.1	7.2.3.2.15.2	4.3.2.15.1[1]	**Intl. Mechanical Code:** 602.2.1	7.2.3.2.14.2	4.3.2.15.1[1]	**Intl.Mechanical Code:** 602.2.1	4.3.11.2.6(2)[4]	
Ramps			7.2.5.3.1(2)			7.2.5.4.1(3)		11.2.5.4.1(2)	7.2.5.4.1(2)
Roof construction in Types I & II construction	603.1#1.3	7.2.3.2.9.2	4.3.2.9.2[1]	603.1#1.3	7.2.3.2.9.2	4.3.2.9.2[1]	603.1#1.3	7.2.3.2.9.2	4.3.2.9.2[1]
Roof construction in Types I, IIA, IIIA, & VA construction when ≥ 20 ft. above the floor	Table 601, Footnote b	7.2.3.2.8 (Types I & II)	4.3.2.9.1[1] (Types I & II)	Table 601, Footnote b	7.2.3.2.8 (Types I & II)	4.3.2.9.1[1] (Types I & II)	Table 601, Footnote b	7.2.3.2.8 (Types I & II)	4.3.2.9.1[1] (Types I & II)
Rooftop structures (penthouses)	1509.2.5		*	1510.2.5		*	1510.2.4		*
Shakes and shingles: Wood	Table 1505.1	38.3.2	*	1505.6	38.3.2	*	1505.6	38.3.2	*
Scenery and stage properties (new construction)			12.4.5.11.3			12.4.6.11.3			12.4.6.11.3
Scenery and stage properties (existing construction)			13.4.5.11.3			13.4.6.11.3			13.4.6.11.3
Wood veneer	1405.5		*	1405.5.1		*	1404.5#1		*
Walls and ceiling furred & dropped more than 1-3/4"	803.11.2		*	803.13.2.1		*	803.15.2.1		*

*See the building code: [1]NFPA 220 [2]NFPA 221 [3]NFPA 30 [4]NFPA 90A

Table 2

Maximum Loads and Spans for PYRO-GUARD® FRT Plywood at Service Temperatures to 170°F

Panel/Sheathing Thickness	Span Rating for Untreated Roof/Sub-floor Sheathing	PYRO-GUARD® Plywood Maximum Live Load (psf)				PYRO-GUARD® Wall/Subfloor Sheathing
		Span (inches)	Climate Zone			Span (inches)
			1A	1B	2	
15/32, 1/2	32/16	24	19	30	43	16
19/32, 5/8	40/20	24 32	42 20	64 32	87 45	20 20
23/32, 3/4	48/24	32 48	34 10	51 18	71 27	24 24
7/8		48	12	20	30	
1 1/8		48	21	33	47	48

[1]Reduction values based on ANSI/AWC NDSI National Design Specification for Wood Construction (NDS)

[2]Loads based on two-span condition with panels minimum 24 inches wide and the strength axis is perpendicular to the framing

[3]Fastener size and spacing must follow the applicable code for untreated plywood of the same thickness

[4]Roof deck sheathing fasteners must be minimum 8d nails spaced maximum 6 inches o.c. at board edge and maximum 12 inches o.c. at supports for panels spanning 24 and 32 inches.

[5]Roof deck sheathing fasteners must be minimum 8d nails spaced maximum 6 inches o.c. at board edge and at supports for panels spanning 48 inches.

[6]Other roof deck sheathing fasteners, excluding staples, having equivalent withdrawal and lateral load resistance to those above are allowed at maximum spacings.

[7]Minimum 10d nails must be used for $1^1/_8$ inch thick roof sheathing panels.

[8]Roof spans and ratings apply to roof systems having the minimum ventilation areas required by the applicable code. 50% of the required vent area must be located on the upper portion of sloped roofs for proper air flow to the unexposed side of the roof deck.

[9]Rigid insulation, minimum R-value 4, or the next thicker sheathing panel for the tabulated span and load, must be used for low-slope assemblies having membrane or built-up roof covering systems having a perm rating less than 0.2. A continuous air barrier and vapor retarder must be used between the ceiling framing and the interior ceiling finish.

[10]For unblocked roof framing diaphragm systems, panel edge clips for the plywood thickness used are required for roof sheathing at midspan between supports for 24 inch and 32 inch spans and two at points $^1/_3$ the distance between supports for 48 inch spans

[11]Tabulated loads for Zone 1A are based on duration of load adjustment for 7-day loads of 1.25

[12]Tabulated loads for Zone 1B and Zone 2 are based on duration of load adjustment for snow of 1.15.

[13]All values in the table are based on a dead load (DL) of 8 psf.

[14]The tabulated live load may be adjusted accordingly for dead loads greater or less than 8 psf.

[15]Applicable material weights: asphalt shingles- 2 psf, ½ inch performance plywood-1.5 psf, $^5/_8$ inch performance plywood-1.8 psf, ¾ inch performance plywood-2.2 psf.

[16]Climate Zones defined:

Zone 1 – Minimum design roof live load or maximum snow load up to 20 psf

A – Southwest Arizona, Southeast Nevada (bounded by Las Vegas, Yuma, Tucson, and Phoenix)

B – All other qualifying areas of the continental United States

Zone 2 – Minimum ground snow load over 20 psf

[17]PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood must not be used as roof sheathing over a radiant barrier.

[18]The 19/32 inch and $^5/_8$ inch performance category plywoods are limited to 4-ply and 5-ply product.

[19]The 23/32 inch and $^3/_4$ inch performance category plywoods are limited to 5-ply and 7-ply product

[20]Subfloor applications other than $1^1/_8$ inch thick panels are limited to 100 psf maximum live load.

[21]Subfloor applications using $1^1/_8$ inch thick panels are limited to 65 psf maximum live total load at 48 inch spans.

[22]Deflection of roof sheathing at the tabulated maximum live load is less than 1/240 of the span and is under the maximum live load plus the dead load is less than 1/180 of the span.

[23]Staples used to attach asphalt shingles must be minimum 15/16 inch crown and minimum 1 inch leg, or comply with the applicable code. Fastener quantity is to be adjusted in accordance with Table 3.

[24]The use of PYRO-GUARD® Fire-Retardant-Treated (FRT) wood products used in exterior wall assemblies requires a water-resistive barrier on the outside of the wall during construction.

[25]For diaphragm and shear wall design, increase the minimum nominal panel thickness required for untreated plywood by a minimum thickness of $^1/_8$ inch when PYRO-GUARD® Fire-Retardant-Treated (FRT) plywood is used.

Table 3
Design Value Adjustment Factors for PYRO-GUARD® FRT Lumber

Physical Property	PYRO-GUARD® Wall/Floor Service Temperature to 100°F			PYRO-GUARD® Roof Framing Service Temperature to 150°F					
	Douglas Fir	Southern Pine	Other Species	Douglas Fir			Southern Pine		
				Climate Zone			Climate Zone		
				1A	1B	2	1A	1B	2
Extreme Fiber Stress in Bending, F_b	0.97	0.91	0.88	0.90	0.93	0.96	0.80	0.85	0.89
Tension Parallel to Grain, F_t	0.95	0.88	0.83	0.80	0.87	0.93	0.80	0.84	0.88
Compression Parallel to Grain, F_c	1.00	0.94	0.94	0.94	0.98	1.00	0.94	0.94	0.94
Horizontal Shear, F_v	0.96	0.95	0.93	0.95	0.95	0.96	0.92	0.93	0.94
Modulus of Elasticity, E	0.96	0.95	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Compression Perpendicular to Grain, F_{cz}	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Fasteners/Connections	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

[1]Reduction values based on ANSI/AWC NDSI National Design Specification for Wood Construction (NDS)

[2]Climate Zones defined:

Zone 1 – Minimum design roof live load or maximum snow load up to 20 psf

A – Southwest Arizona, Southeast Nevada (bounded by Las Vegas, Yuma, Tucson, and Phoenix)

B – All other qualifying areas of the continental United States

Zone 2 – Minimum ground snow load over 20 psf

[3]Duration of load adjustments for snow loads, 7-day loads, and wind loads from National Design Specifications for Wood Construction apply.

[4]Where lumber decking serves both as the exposed ceiling and roofing sheathing, extreme fiber bending adjustments of 0.83, 0.84, and 0.89 must be used for Southern Pine in Zone 1A, Zone 1B, and Zone 2, respectively.

[5]Where lumber decking serves both as the exposed ceiling and roofing sheathing, extreme fiber bending adjustments of 0.92, 0.92, and 0.96 must be used for Douglas Fir in Zone 1A, Zone 1B, and Zone 2, respectively.

[6]Extreme fiber in bending adjustments of 0.91 for Southern pine and 0.97 for Douglas Fir are permitted in all zones where insulation having a minimum R value of 4 is installed above the decking.

[7]Roof framing adjustment factors apply to roof systems with minimum ventilation areas as per the applicable code. 50 percent of the required vent area is to be on the upper portion of sloped roofs to provide natural air flow.

[8]Other species refers to those other than Southern pine and Douglas Fir referenced in this report.

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