ICC-ES Evaluation Report

ESR-2645

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DIVISION: 06 00 00—WOOD, PLASTICS, AND COMPOSITES
Section: 06 05 73.33—Fire-Retardant Wood Treatment

REPORT HOLDER:

VIANCE, LLC
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EVALUATION SUBJECT:

D-BLAZE® FIRE-RETARDANT-TREATED LUMBER AND PLYWOOD

ADDITIONAL LISTEES:

FONTANA WOOD PRESERVING
15500 VALENCIA AVENUE
POST OFFICE BOX 1070
FONTANA, CALIFORNIA 92334-1070

THUNDERBOLT WOOD TREATING
3400 PATTERSON ROAD
RIVERBANK, CALIFORNIA 95367

TRUEGUARD LLC
715 DENVER AVENUE
LOVELAND, COLORADO 80537

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)

Properties evaluated:

- Flame spread
- Structural
- Corrosion
- Hygroscopicity

2.0 USES

D-Blaze® fire-retardant-treated wood is used in interior areas that are not exposed to the weather or wetting, but may be exposed to dampness where the code permits the use of wood or fire-retardant-treated wood.

3.0 DESCRIPTION

3.1 General:

D-Blaze® interior fire-retardant-treated wood is lumber and plywood that is pressure-impregnated with D-Blaze® fire-retardant chemicals.

D-Blaze treatment of lumber of the following species is recognized as being fire-retardant:

Southern pine	Engelmann spruce
Ponderosa pine	White spruce
Douglas fir	Alpine fir
Western hemlock	Balsam fir
Red pine	Lodgepole pine
White fir	Hem-fir
Basswood	Jack pine
Red oak	Red spruce
Spruce-pine-firBlack spruce	

D-Blaze® treatment of plywood fabricated with face and back veneers of the following species is recognized as being fire-retardant:

Southern pine	Douglas fir
Lauan	Red pine

3.2 Flame Spread:

D-Blaze® fire-retardant-treated wood has a flame-spread index of 25 or less when subjected to ASTM E 84 tests of 30 minutes duration without evidence of significant progressive combustion.

3.3 Structural Strength and Durability:

3.3.1 General: The effects of the D-Blaze® fire-retardant treatment on the strength of the treated lumber and plywood must be accounted for in the design of the wood members and their connections. Load duration factors greater than 1.6 are not permitted to be used in the design.

3.3.2 Lumber: The strength properties of lumber, when treated with D-Blaze® fire-retardant chemicals and used in applications at ambient temperatures up to 150°F (66°C), must be subject to the strength design factors shown in Table 1.

3.3.3 Plywood: The strength properties of plywood, when treated with D-Blaze® fire-retardant chemicals and used in applications at temperatures up to 170°F (76.5°C), must be subject to the span limitations shown in Tables 2 and 3.

3.4 Corrosion:

The corrosion rate of aluminum (2024-T3), carbon steel (SAE 1010), or galvanized steel in contact with wood is not increased by D-Blaze® fire-retardant treatment when the product is used as recommended by the manufacturer.

3.5 Hygroscopicity:

D-Blaze® treated wood qualifies as an Interior Type A (HT) fire-retardant wood in accordance with the American Wood-Protection Association (AWPA) Standard U1, Commodity Specification H, Use Category UCFA.

4.0 DESIGN AND INSTALLATION

4.1 General:

Structural systems that include D-Blaze® fire-retardant-treated lumber or plywood must be designed and installed in accordance with the applicable code using the appropriate lumber design value adjustment factors and plywood load and spans from Tables 1, 2, 3 and 4 of this report. Ventilation must be provided in accordance with the applicable codes.

The strength design factors and plywood load and spans in Tables 1, 2, 3 and 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 that require special consideration in design.

The treated lumber and plywood must only be used in areas (including attic spaces) where the lumber is exposed to temperatures of 150°F (66°C) or less and the plywood is exposed to temperatures of 170°F (76.5°C) or less.

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).

4.2 Fasteners:

Fasteners used in D-Blaze® fire-retardant-treated wood must be galvanized steel, stainless steel, silicon bronze or copper, in accordance with 2009 and 2006 IBC Section 2304.9.5, 2009 IRC Section R317.3 or 2006 IRC Section R319.3

Fastener capacity utilized with D-Blaze® treated wood must be the allowable design capacity for nontreated woodmultiplied by the applicable compression parallel-to-grain and perpendicular-to-grain reduction factor, as specified in Table 1.

5.0 CONDITIONS OF USE

The D-Blaze® Fire-Retardant-Treated Wood described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Strength calculations must be subject to the design factors or span ratings shown in Tables 1, 2 and 3.

5.2 The strength design 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.

5.3 D-Blaze® treated wood must not be installed where it will be exposed to precipitation, direct wetting or regular condensation.

5.4 D-Blaze® treated wood must not be used in contact with the ground.

5.5 D-Blaze® lumber must not be ripped or milled as this will alter the surface-burning characteristics and invalidate the flame-spread classification. Framing, end cuts, holes, joints such as tongue and groove, bevel, scarf and lap may be used.

5.6 Treatment is at the facilities of the listees noted in this report, under a quality control program with inspections by UL LLC (AA-668) (limited to ñFR-2ò classifications) and either Timber Products Inspection Inc. (AA-696 and AA-664) or Southern Pine Inspection Bureau, Inc. (AA-680).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fire-retardant-treated Wood (AC66), dated February 2010.

7.0 IDENTIFICATION

Lumber and plywood treated with D-Blaze® fire-retardant chemicals must 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 UL LLC (AA-668) (limited to ñFR-2ò classifications) and either Timber Products Inspection Inc. (AA-696 and 664) or Southern Pine Inspection Bureau, Inc. (AA-680)]; the Viance, LLC, or listee, name and address; the production plant identification (refer to Table 5 for treatment locations); labeling information in accordance with Section 2303.2.4 of the 2009 IBC and Section 2303.2.1 of the 2006 IBC; and the evaluation report number (ESR-2645). Refer toFigure 1.

TABLE 1—STRENGTH DESIGN ADJUSTMENT FACTORS FOR D-BLAZE® FIRE-RETARDANT LUMBER COMPARED TO UNTREATED LUMBER

PROPERTY	SERVICE TEMPERATURE < 100°F (38°C)	D-BLAZE® LUMBER ROOF FRAMING, CLIMATE ZONE[1,2]		
		1A	1B	2
Compression Parallel, Fc	0.935	0.935	0.935	0.935
Horizontal Shear	0.985	0.838	0.894	0.964
Tension Parallel	0.874	0.625	0.775	0.905
Bending: Modulus of Elasticity, E	1.000	0.977	0.986	0.997
Bending: Extreme Fiber Stress, Fb	0.972	0.740	0.828	0.939
Fasteners/Connectors	0.90	0.900	0.900	0.900

[1]Climate Zone definition:

Zone 1 ï Minimum design roof live load or maximum ground snow load Ò20 psf (960 Pa)
Zone 1A ï SouthWest Arizona, South East Nevada (area Bounded by Las Vegas- Yuma- Phoenix- Tucson)
Zone 1B- All other qualifying areas of the United States
Zone 2 ï Maximum ground snow load Ó20 psf (960 Pa)

[2]Duration of load adjustments for snow loads, 7-day (construction) loads, and wind loads as given in the National Design Specifications for Wood Construction applies.

TABLE 2—SPAN RATINGS FOR D-BLAZE® FIRE RETARDANT SOUTHERN PINE PLYWOOD FOR ROOF SHEATHING APPLICABLE AT A TEMPERATURE UP TO170°F (77°C) BASED ON UNIFORM LOADING, TWO SPAN CONSTRUCTION AND L/180 DEFLECTION LIMIT

PLYWOOD THICKNESS (inches)		D-BLAZE® [1,2,3,4,5,8,9,10,11,12] PLYWOOD ROOF SHEATHING SPAN RATINGS USED AT TEMPERATURES > 100°F (38°C) AND <170°F (77°C)		
		CLIMATE ZONE[6,7]		
		ZONE 1A	ZONE 1B	ZONE 2
3/8	0.375	20	20	20
15/32	0.469	24	24	24
1/2	0.500	24	24	24
19/32	0.594	32	32	32
5/8	0.625	32	32	32
23/32	0.719	40	32	40
3/4	0.750	40	32	40
7/8	0.875	40	40	48
1	1.000	48	48	48
1 1/8	1.125	48	48	48

SI Units Conversion: 1 inch = 25.4 mm, 1 psf = 48 N/m^2.

[1]All loads are based on two-span condition with panels 24 inches wide or wider, strength axis perpendicular to supports.
[2]Fastener size and spacing must be as required in the applicable building code for untreated plywood of the same thickness.
[3]Roof spans and loads apply to roof systems having the minimum ventilation areas required by the applicable building code. Fifty percent of required vent area must be located on upper portion of sloped roofs to provide natural air flow.
[4]For low-sloped or flat roofs with membrane or built-up roofing having a perm rating less than 0.2, use rigid insulation having a minimum *R* value of 4.0 between sheathing and roofing, or use next thicker panel than tabulated for the span and load (e.g., 19/32 for 24 inches, 23/32 for 32 inches); and use a continuous ceiling air barrier and vapor retarder with a perm rating less than 0.2 on the bottom of the roof framing above the ceiling finish.
[5]For unblocked roof diaphragms panel edge clips are required for roof sheathing: one midway between supports for 24-inch and 32-inch spans, two at 1/3 points between supports for 48-inch span. Clips must be specifically manufactured for the plywood thickness used.
[6]Tabulated loads for Zone 1A are based on a duration of load adjustment for 7-day (construction) loads of 1.25. Tabulated loads for Zone 1B and Zone 2 are based on a duration of load adjustment for snow of 1.15. All values within the table are based on a dead load (DL) of 8 psf. If the DL is less than or greater than 8 psf, the tabulated live load may be increased or decreased by the difference. Applicable material weights, psf: asphalt shingles - 2.0, 1/2-inch plywood - 1.5, 5/8-inch plywood - 1.8, 3/4-inch plywood - 2.2.
[7]Climate Zone definition:

ZONE 1 ï Minimum design roof live load or maximum ground snow load Ò20 psf (960 Pa)
ZONE 1A ï SouthWest Arizona, South East Nevada (area Bounded by Las Vegas- Yuma- Phoenix- Tucson)
ZONE 1B- All other qualifying areas of the United States
ZONE 2 ï Maximum ground snow load Ó20 psf (960 Pa)

[8]Duration of load adjustments for snow loads, 7-day (construction) loads, and wind loads as given in the National Design Specifications for Wood Construction applies.
[9]D-Blaze treated plywood must not be used as roof sheathing if a radiant shield is used beneath the roof sheathing.
[10]The 19/32-inch and 5/8-inch thickness are limited to performance rated 4-ply or 5-ply. 23/32- and 3/4-inch thicknesses are limited to performance rated 5-ply or 7-ply.
[11]Deflection of roof sheathing at tabulated maximum live load is less than 1/240 of the span, and under maximum live load plus dead load is less than 1/180 of the span.
[12]Staples used to attach asphalt shingles must be minimum 15/16-inch crown and minimum 1-inch leg, or otherwise comply with the applicable code, with the quantity of fasteners adjusted in accordance with Table 1 of this report.

TABLE 3—SPAN RATINGS FOR D-BLAZE® FIRE RETARDANT DOUGLS FIR AND OTHER SPECIES PLYWOOD FOR ROOF SHEATHING APPLICABLE AT A TEMPERATURE UP TO 170°F (77°C) BASED ON UNIFORM LOADING, TWO SPAN CONSTRUCTION AND L/180 DEFLECTION LIMIT

PLYWOOD THICKNESS (inches)		D-BLAZE®[1,2,3,4,5,8,9,10,11,12] PLYWOOD ROOF SHEATHING SPAN RATINGS USED AT TEMPERATURES > 100°F (38°C) AND <170°F (77°C)		
		CLIMATE ZONE[6,7]		
		ZONE 1A	ZONE 1B	ZONE 2
3/8	0.375	16	16	20
15/32	0.469	20	20	24
1/2	0.500	20	20	24
19/32	0.594	24	24	32
5/8	0.625	24	24	32
23/32	0.719	32	32	32
3/4	0.750	32	32	32
7/8	0.875	40	32	40
1	1.000	40	40	48
1 1/8	1.125	48	40	48

SI Units Conversion: 1 inch = 25.4 mm, 1 psf = 48 N/m^2.

[1]All loads are based on two-span condition with panels 24 inches wide or wider, strength axis perpendicular to supports.
[2]Fastener size and spacing must be as required in the applicable building code for untreated plywood of the same thickness.
[3]Roof spans and loads apply to roof systems having the minimum ventilation areas required by the applicable building code. Fifty percent of required vent area must be located on upper portion of sloped roofs to provide natural air flow.
[4]For low-sloped or flat roofs with membrane or built-up roofing having a perm rating less than 0.2, use rigid insulation having a minimum *R* value of 4.0 between sheathing and roofing, or use next thicker panel than tabulated for the span and load (e.g., 19/32 for 24 inches, 23/32 for 32 inches); and use a continuous ceiling air barrier and vapor retarder with a perm rating less than 0.2 on the bottom of the roof framing above the ceiling finish.
[5]For unblocked roof diaphragms panel edge clips are required for roof sheathing: one midway between supports for 24-inch and 32-inch spans, two at 1/3 points between supports for 48-inch span. Clips must be specifically manufactured for the plywood thickness used.
[6]Tabulated loads for Zone 1A are based on a duration of load adjustment for 7-day (construction) loads of 1.25. Tabulated loads for Zone 1B and Zone 2 are based on a duration of load adjustment for snow of 1.15. All values within the table are based on a dead load (DL) of 8 psf. If the DL is less than or greater than 8 psf, the tabulated live load may be increased or decreased by the difference. Applicable material weights, psf: asphalt shingles - 2.0, 1/2-inch plywood - 1.5, 5/8-inch plywood - 1.8, 3/4-inch plywood - 2.2.
[7]Climate Zone definition:

ZONE 1 ï Minimum design roof live load or maximum ground snow load Ò20 psf (960 Pa)
ZONE 1A ï SouthWest Arizona, South East Nevada (area Bounded by Las Vegas- Yuma- Phoenix- Tucson)
ZONE 1B- All other qualifying areas of the United States
ZONE 2 ï Maximum ground snow load Ó20 psf (960 Pa)

[8]Duration of load adjustments for snow loads, 7-day (construction) loads, and wind loads as given in the National Design Specifications for Wood Construction applies.
[9]D-Blaze treated plywood must not be used as roof sheathing if a radiant shield is used beneath the roof sheathing.
[10]The 19/32-inch and 5/8-inch thickness are limited to performance rated 4-ply or 5-ply. 23/32- and 3/4-inch thicknesses are limited to performance rated 5-ply or 7-ply.
[11]Deflection of roof sheathing at tabulated maximum live load is less than 1/240 of the span, and under maximum live load plus dead load is less than 1/180 of the span.
[12]Staples used to attach asphalt shingles must be minimum 15/16-inch crown and minimum 1-inch leg, or otherwise comply with the applicable code, with the quantity of fasteners adjusted in accordance with Table 1 of this report.

TABLE 4—D-BLAZE® TREATED PLYWOOD SUBFLOOR ALLOWABLE SPANS (INCHES) USED AT TEMPERATURES <100°F (38°C)

PLYWOOD THICKNESS (inches)	SOUTHERN PINE ALLOWABLE SPAN (inches)[1,2]	DOUGLAS FIR ALLOWABLE SPAN (inches)[1,2]
3/8	12	12
15/32	16	16
1/2	16	16
19/32	19.2	19.2
5/8	19.2	19.2
23/32	24	24
3/4	24	24
7/8	24	24
1	32	32
1 1/8	32	32

SI Units Conversion: 1 inch = 25.4 mm, 1 psf = 48 N/m^2.

[1]Uniform live load = 100 psf and Dead load = 10 psf, LL deflection ÒL/360, LL+ DL deflection ÒL/240
[2]Fastener size and spacing must be as required in the applicable building code for untreated plywood of the same thickness.

TABLE 5—D-BLAZE TREATMENT LOCATIONS

LISTEES	D-BLAZE TREATMENT LOCATIONS
Fontana Wood Preserving	Fontana, CA
Thunderbolt Wood Treating	Riverbank, CA
TrueGuard, LLC	Loveland, CO

Standard D-Blaze® 2009
Monitored by:
[Inspection Agency Name] (AA-XXX)
ASTM E84/AWPA U1, UCFA, P50 FR-2
Interior Type A, (HT), KDAT
09 D-Blaze® 10
ESR-2645

[Wood Species] Treated Lumber
Flame Spread [ ]
Smoke Developed [ ]
[Treating Company Name]
[Location]

Standard D-Blaze® 2009
Monitored by:
[Inspection Agency Name] (AA-XXX)
ASTM E84/AWPA U1, UCFA, P50 FR-2
Interior Type A, (HT), KDAT
09 D-Blaze® 10
ESR-2645

[Wood Species] Treated Plywood
Flame Spread [ ]
Smoke Developed [ ]
[Treating Company Name]
[Location]

FIGURE 1—LUMBER AND PLYWOOD STAMPS