

D-BLAZE

FIRE RETARDANT TREATED WOOD

D-Blaze® fire retardant treated (FRT) wood is available for interior applications where fire retardant construction materials are required by building codes. D-Blaze® treated lumber and plywood is highly effective in controlling the spread of flame and smoke caused by fire.

D-Blaze® treated products show no evidence of significant progressive combustion at 30 minutes exposure to flame. In most applications, D-Blaze® treated products offer a lower in-place cost than noncombustible-classified materials.

Product Features

- UL® Classified with FR-S Rating
- Code Compliant under ESR 2645
- Very Low Smoke Rating
- Workable with common wood-working tools
- 50-Year Limited Warranty
- Low-corrosivity
- Low-hygroscopicity
- No VOC's or Formaldehyde
- Non-blooming

D-Blaze® Treated Products are:

- Compliant with major building codes (IBC & IRC).
- Tested and certified by Underwriters Laboratories® (UL).
- Quality Control assured by third-party inspection agencies such as TP, SPIB and UL.
- UL® classified with an FR-S rating for the species listed in Table 5. Exhibits a flame spread and smoke developed index of 25 or less under ASTM E 84 flame tunnel testing of a 30-minute duration without evidence of significant progression combustion. D-Blaze has one of the lowest smoke ratings in the industry.
- Compliant with codes under ICC-ES ESR 2645 for the species listed in Table 5. Exhibits a flame spread index of 25 or less when subjected to ASTM E 84 flame tunnel testing of 30-minute duration without evidence of significant progressive combustion.
- Tested for hygroscopicity in accordance with ASTM D 3201, resulting in classification as an interior Type A (HT) fire-retardant wood as defined in AWP Standards P50, U1, UCFA.
- Protected by a **50-Year** Limited Warranty. Visit www.TreatedWood.com for warranty details.

Common Applications

- Roof and floor trusses
- Roof decks and sheathing
- Interior non-load-bearing partitions
- Exterior load-bearing walls protected by a weather barrier
- Subflooring
- Studs and Joists
- Beams and purlins
- Blocking and furring

How to Specify D-Blaze® FRT Lumber and Plywood

To assure structural integrity in roof areas of high temperature and humidity, D-Blaze® span and strength design adjustment factors have been determined by independent third parties in accordance with ASTM D 5516 for plywood and ASTM D 5664 for lumber. Extended specifications can be found in Sweet's Directory and ARCAT.

All D-Blaze® FRT lumber and plywood:

- shall be pressure-treated with D-Blaze® fire retardant to meet Underwriters Laboratories FR-S rating or a flame spread and smoke index rating denoting a surface-burning characteristic rating of 25 or less for flame spread and smoke developed.
- shall bear the Underwriters Laboratories label or stamp attesting to the FR-S rating or flame spread and smoke index rating, or the ESR 2645 Building Code Approval, and to the fact that it also meets the American Wood Protection Association (AWPA) P50, U1, UCFA for interior Type A (HT) use.
- shall be kiln-dried to a maximum moisture content of 19% for lumber and 15% for plywood.
- shall be kept dry at all times during transit, job site storage and construction.

All structural design calculations shall be based on the D-Blaze® Strength Design Factor Tables as published in ESR 2645.

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ARCAT

Standardized 3-part specifications are available at www.Sweets.com and www.ARCAT.com.



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ESR 2645



FR-S Rating



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Structural Properties

D-Blaze® FRT wood has been tested by independent laboratories following industry standards ASTM D 5516 & ASTM D 5664 to develop strength reduction factors for various use conditions, including roof temperatures of up to 150° F for lumber and 170° F for plywood. Consult Table 1 (D-Blaze® Lumber Strength Design Adjustment Factors) and Table 2, 3 and 4 (D-Blaze® Plywood Span Rating Adjustments) for specific adjustment factors.

Testing and Approvals

D-Blaze® FRT wood meets or exceeds the guidelines for testing construction materials as set forth and/or established by the following authorities and specifications:

Testing

- ASTM D 5516
- ASTM D 5664
- ASTM E 84
- ASTM D 3201

Approvals

- ICC-ES ESR 2645
- City of Los Angeles RR 24502
- CAN/ULC S102
- CAN/ULC S102.2
- National Fire Protection Association (255)
- New York City Building Code (MEA Numbers 406-87 and 407-87)
- National Building Code of Canada

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	0.900	0.900	0.900	0.900

Table 1

¹Climate Zone definition:

Zone 1 – Minimum design roof live load or maximum ground snow load ≤ 20 psf (960 Pa)

Zone 1A – 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 – Maximum ground snow load ≥ 20 psf (960 Pa)

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

Table 2

Span Ratings for D-Blaze® Fire Retardant Southern Pine 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® 1,2,3,4,5,8,9,10,11,12,13 Plywood Roof Sheatings Span Ratings Used at Temperatures > 100° F and < 170° F		
	Climate Zone ^{6,7}		
	1A	1B	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

Table 3

Span Ratings for D-Blaze® Fire Retardant Douglas 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® 1,2,3,4,5,8,9,10,11,12,13 Plywood Roof Sheatings Span Ratings Used at Temperatures > 100° F and < 170° F		
	Climate Zone ^{6,7}		
	1A	1B	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

Tables 2 and 3

SI Units Conversion: 1 inch = 25.4 mm, 1 psf = 48 N/m²

- ¹All loads are based on two-span condition with panels 24 inches wide or wider, strength axis perpendicular to supports.
- ²Fastener size and spacing must be as required in the applicable building code for untreated plywood of the same thickness.
- ³Roof 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.
- ⁴For 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.
- ⁵For 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.
- ⁶Tabulated 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.
- ⁷Climate Zone definition:
 - ZONE 1 – Minimum design roof live load or maximum ground snow load ≤ 20 psf (960 Pa)
 - ZONE 1A – 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 – Maximum ground snow load ≥ 20 psf (960 Pa)
- ⁸Duration of load adjustments for snow loads, 7-day (construction) loads, and wind loads as given in the National Design Specifications for Wood Construction apply.
- ⁹D-Blaze treated plywood must not be used as roof sheathing if a radiant shield is used beneath the roof sheathing.
- ¹⁰The 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.
- ¹¹Deflection 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.
- ¹²Staples 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.
- ¹³Placement of insulation and airflow should be designed to maintain acceptable wood temperatures. Good ventilation is essential in fire retardant wood construction to minimize excessive relative humidity and condensation. At relative humidity conditions when FRW moisture content levels are expected to exceed 15%, appropriate design value adjustments for high moisture content should be made.

Table 4

D-Blaze® Treated Plywood Subfloor Allowable Spans (Inches) used at Temperatures < 100° F (38° C)		
Plywood Thickness (Inches)	Southern Pine	Douglas Fir
	Allowable Span (Inches) ^{1,2}	Allowable Span (Inches) ^{1,2}
3/8" (0.375)	16	16
15/32" (0.469)	20	20
1/2" (0.500)	20	20
19/32" (0.594)	24	24
5/8" (0.625)	24	24
23/32" (0.719)	32	32
3/4" (0.750)	32	32
7/8" (0.875)	40	32
1 (1.000)	40	40
1 - 1/8" (1.125)	48	40

Table 4

SI Units Conversion: 1 inch = 25.4 mm, 1 psf = 48 N/m²

¹Uniform live load = 100 psf and Dead load = 10 psf, LL deflection ≤ L/360, LL+ DL deflection ≤ L/240

²Fastener size and spacing must be as required in the applicable building code for untreated plywood of the same thickness.

Proper roof system ventilation shall be used to provide a uniform flow of air over all interior surfaces of the plywood to prevent heat build-up and sufficient to effectively remove moisture where the roof is warmed by solar radiation.

Safety & Handling

D-Blaze® pressure-treated products do not contain any EPA-listed hazardous chemicals and are easy to work with, requiring no special precautions other than routine wood working safety procedures. When working with or machining D-Blaze® pressure-treated wood, the following safety precautions should be followed:

- Wear gloves to protect against splinters.
- Wear a dust mask when machining any wood to reduce the inhalation of wood dusts.
- Wear appropriate eye protection to reduce the potential for eye injury from wood particles and flying debris during machining.
- Wash thoroughly with mild soap and water after working with treated wood.
- Wood scraps should be disposed of in accordance with local waste management regulations.
- Do not burn.

Refer to the latest D-Blaze® Material Safety Data Sheet available at www.TreatedWood.com.

Table 5

The following species are building code compliant when treated according to ESR 2645, and these species also have the UL® FR-S Classification.

D-Blaze® Lumber and Plywood Approved Species			
Softwood Lumber			
Jack Pine	Red Pine	Hem-Fir	Black Spruce
Lodgepole Pine	Alpine Fir	Spruce-Pine-Fir (SPF)	Englemann Spruce
Ponderosa Pine	Balsam Fir	White Fir	Red Spruce
Southern Pine	Douglas Fir	Western Hemlock	White Spruce
Plywood		Hardwood lumber	
Douglas Fir		Basswood	
Lauan		Red Oak	
Southern Pine			
Red Pine			

NOTE: From time to time, additional species will be tested. Check with your supplier if the species desired are not shown.



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ESR 2645



FR-S Rating