

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 at ARCAT.com.

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, 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.

*Note: Designer may wish to specify lower moisture content for cabinet and millwork.

All structural design calculations shall be based on the Strength Design Factor Tables as published in D-Blaze Technical Specifications brochure.

Standardized 3-part specifications

[D-Blaze FRTW CSI 3-part and Canadian CSC architectural specs](http://www.ARCAT.com) are available at www.ARCAT.com

Continuing Education Units (CEU)

Architects, specifiers, and designers can learn more by taking [a Continuing Education course on FRTW sponsored by Viance and provided by Ron Blank Associates.](#)

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.

Data Tables to Follow

Data Tables

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

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 SHEATHING 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			
PLYWOOD THICKNESS (INCHES)	D-BLAZE® 1,2,3,4,5,8,9,10,11,12,13 PLYWOOD ROOF SHEATHING SPAN RATINGS		
	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

Notes for Tables 2 and 3:

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

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 – Minimum design roof live load or maximum ground snow load \leq 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 \geq 20 psf (960 Pa)

⁸ D-Blaze treated plywood must not be used as roof sheathing if a radiant shield is used beneath the roof sheathing.

⁹ 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.

¹⁰ 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.

¹¹ 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	Douglas Fir
	Allowable Span (Inches)^{1,2}	Allowable Span (Inches)^{1,2}
3/8" (0.375)	16	12
15/32" (0.469)	16	16
1/2" (0.500)	16	16
19/32" (0.594)	19.2	19.2
5/8" (0.625)	19.2	19.F2
23/32" (0.719)	24	24
3/4" (0.750)	24	24
7/8" (0.875)	24	24
1 (1.000)	32	32
1 1/8" (1.125)	32	32

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

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

² Fastener 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.

Table 5

The following species are building code compliant and listed by UL with an FR-S rating when treated with D-Blaze

D-Blaze Lumber and Plywood Approved Species

Softwood Lumber			
Jack Pine Lodgepole Pine Ponderosa Pine Southern Yellow Pine	Red Pine Alpine Fir Balsam Fir Douglas Fir	Hem-Fir Spruce-Pine-Fir (SPF) White Fir Western Hemlock	Black Spruce Englemann Spruce Red Spruce White Spruce

Plywood		Hardwood Lumber
Douglas Fir Lauan	Red Pine Southern Yellow Pine	Basswood Red Oak

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