

GLOBAL Laminated Veneer Lumber Global LVL Inc.

PR-L301

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Product: Global LVL

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1. Basis of the product report:
 - 2018 and 2015 International Building Code (IBC): Sections 104.11 Alternative material and 2303.1.10 Structural composite lumber
 - 2012 IBC: Sections 104.11 Alternative materials and 2303.1.9 Structural composite lumber
 - 2018 and 2015 International Residential Code (IRC): Sections R104.11 Alternative materials, and R502.1.5, R602.1.5, and R802.1.4 Structural composite lumber
 - 2012 IRC: Sections R104.11 Alternative materials, and R502.1.7, R602.1.4, and R802.1.6 Structural composite lumber
 - ASTM D5456-14b, D5456-13, and D5456-09 recognized by the 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
 - APA Reports T2006P-55, T2011P-04, T2011P-06B, T2011P-16A, T2011P-22, T2012P-06, and T2019P-55, and other qualification data.
2. Product description:

Global 2800Fb-1.7E and 2850Fb-1.9E LVL are made with aspen veneers, and Global 3025Fb-1.9E and 3300Fb-2.0E LVL are made with birch/aspen veneers, of various grades in accordance with the in-plant manufacturing standard approved by APA. Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL are available in thicknesses from 1.19 inches to 1-3/4 inches, widths of 3-1/2 inches to 24 inches, and lengths up to 60 feet.
3. Design properties:

Table 1 lists the Allowable Stress Design properties for Global LVL. Table 2 lists the equivalent specific gravities for fastener design of Global LVL. Table 3 lists the allowable nail spacing for Global LVL. The allowable spans for Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL shall be in accordance with the recommendations provided by the manufacturer.
4. Product installation:

Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL shall be installed in accordance with the recommendations provided by the manufacturer. Permissible details and allowable hole sizes shall be in accordance with the recommendations provided by the manufacturer.
5. Fire-rated assemblies:

The provisions of 2018 and 2015 IBC Section 722 Calculated fire resistance, and 2012 IBC Section 722.6.3 Design of fire-resistant exposed wood members shall be applicable to Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL. Fire-rated assemblies shall be constructed in accordance with the recommendations provided by APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (www.apawood.org/resource-library) and the manufacturer.

Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL products recognized in this report with a minimum net dimension of 1-1/2 inches by 9-1/4 inches meet

the requirements prescribed in Exception 4 of 2018 and 2015 IRC Section R302.13 and 2012 IRC Section R501.3 Fire protection of floors.

6. Limitations:

- a) Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL shall be designed in accordance with the code using the design properties specified in this report.
- b) Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
- c) Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL are produced at the Global LVL Inc., Ville-Marie, Quebec, Canada facility, under a quality assurance program audited by APA.
- d) This report is subject to re-examination in one year.

7. Identification:

Global 2800Fb-1.7E, 2850Fb-1.9E, 3025Fb-1.9E, and 3300Fb-2.0E LVL described in this report are identified by a label bearing the manufacturer's name (Global LVL Inc.) and/or trademark, the APA assigned plant number (1099), the LVL grade, the APA logo, the report number PR-L301, and a means of identifying the date of manufacture.

Table 1. Allowable Stress Design Properties for Global LVL (a,b)

Property		Design Stress for Allowable Stress Design (psi)			
Grade		2800Fb-1.7E	2850Fb-1.9E	3025Fb-1.9E	3300Fb-2.0
Species		Aspen	Aspen	Birch - Aspen	Birch - Aspen
Bending (F_b) (c)	Joist (d)	2,800	2,850	3,025	3,300
	Plank	2,800	2,850	3,025	3,300
Modulus of Elasticity (E_{true}) (e)	Joist	1.7×10^6	1.9×10^6	1.9×10^6	2.0×10^6
	Plank	1.7×10^6	1.9×10^6	1.9×10^6	2.0×10^6
Tension parallel to grain (F_t) (f)		1,850	2,000	2,100	2,300
Horizontal shear (F_v)	Joist	220	250	290	290
	Plank	150	150	150	150
Compression parallel ($F_{c }$)		2,600	2,900	2,700	2,700
Compression perpendicular ($F_{c\perp}$)	Joist	475	550	575	575
	Plank	280	450	500	500

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 4.448 N, 1 psi = 6.9 kPa.

- (a) Design values provided in this table are based on covered, dry conditions of use. The tabulated values are design values for normal duration of load. All values, except for E and $F_{c\perp}$, are permitted to be adjusted for other load durations as permitted by the code.
- (b) Joist = load parallel to glueline, plank = load perpendicular to glueline.
- (c) Tabulated bending stress (F_b) may be increased by 4 percent when the member qualifies as a repetitive member as defined in the NDS.
- (d) The tabulated values are based on a reference depth of 12 inches. For other depths, when loaded edgewise, the allowable bending stress (F_b) shall be modified by $(12/d)^{0.25}$ for Global 2800Fb-1.7E and 2850Fb-1.9E LVL, and $(12/d)^{0.15}$ for Global 3025Fb-1.9E and 3300Fb-2.0E LVL, as shown in the following table, where d = member depth in inches. For depths less than 3-1/2 inches, the factor for the 3-1/2-inch depth shall be used.

Depth (in.)	3-1/2	5-1/2	7-1/4	9-1/4	9-1/2	11-1/4	11-7/8	14	16	18	24
2800Fb-1.7E & 2850Fb-1.9E Multiply by	1.36	1.22	1.13	1.07	1.06	1.02	1.0	0.96	0.93	0.90	0.84
3025Fb-1.9E & 3300Fb-2.0E Multiply by	1.20	1.12	1.08	1.04	1.04	1.01	1.0	0.98	0.96	0.94	0.90

- (e) The tabulated modulus of elasticity for Global LVL is the shear-free modulus of elasticity (E_{true}). For uniformly loaded simple-span beams, deflection is calculated as follows:

$$\delta = \frac{270 wL^4}{Ebh^3} + \frac{28.8 wL^2}{Ebh}$$

Where: δ = estimated deflection, inches w = uniform load, plf
 L = span, feet h = beam depth, inches
 b = beam width, inches E = true (shear-free) modulus of elasticity, psi

- (f) The tabulated values are based on a reference length of 20 feet. For lengths greater than 20 feet, the allowable tensile stress shall be modified by $(20/L)^{0.075}$ for all grades of Global LVL, where L = member length in feet.

Table 2. Fastener Design for Global LVL

GRADE	EQUIVALENT SPECIFIC GRAVITY (S.G.)					
	NAILS				BOLTS	
	Withdrawal Load		Lateral Load		Lateral Load	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Installed in Face	
Parallel to Grain					Perpendicular to Grain	
2800Fb-1.7E	0.50	0.50	0.42	0.45	0.36	0.44
2850Fb-1.9E	0.46	0.46	0.43	0.43	0.43	0.43
3025Fb-1.9E & 3300Fb-2.0E	0.50	0.50	0.50	0.50	0.50	0.50

Table 3. Allowable Minimum Nail Spacings for Global LVL ^(a,b,c)

Connector Size	Nails Installed in the Narrow Face ^(d)	
	On-Center Spacing (inches)	End Distance (inches)
8d box (0.113" x 2-1/2") and common (0.131" x 2-1/2") nail	3	2-1/2
10d box (0.128" x 3") and common (0.148" x 3") nail	4	3
16d sinker (0.148" x 3-1/4") and 12d common (0.148" x 3-1/4") nail	4	3
16d common (0.162" x 3-1/2") nail ^(e)	8	4

For SI: 1 inch = 25.4 mm.

- (a) The minimum on-center spacing permitted for nails installed in the wide face of Global LVL is the same as that permitted by the applicable code for solid-sawn lumber.
- (b) Fastener sizes and closest on-center spacing not specifically described above are beyond the scope of this report.
- (c) Edge distance shall be sufficient to prevent splitting.
- (d) Unless otherwise specified, the LVL shall be at least 1-1/2 inches thick and 3-1/2 inches wide when nails are installed parallel to the gluelines on the narrow face of material.
- (e) The minimum on-center nail spacing is permitted to be reduced to 4 inches when nailing through bottom wall plate and sheathing (maximum 1-3/8 inches of penetration).

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