APA PRODUCT REPORT®

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Calvert GL 3000 Glulam
Calvert Company, Inc.

PR-L269

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Products: Calvert GL 3000 Glulam
Calvert Company, Inc., 218 V Street, Vancouver, WA 98661
(360) 693-0971
www.calvertglulam.com

1. Basis of the product report:
   - 2015, 2012 and 2009 International Building Code (IBC): Sections 104.11 Alternative materials and 2303.1.3 Structural glued laminated timber
   - 2015 International Residential Code (IRC): Sections R104.11 Alternative materials, and R502.1.3, R602.1.3, and R802.1.2 Structural glued-laminated timber
   - 2012 and 2009 IRC: Sections R104.11 Alternative materials, and R502.1.5, R602.1.2, and R802.1.4 Structural glued-laminated timber
   - ASTM D3737-12 recognized by the 2015 IBC and IRC, and D3737-08 and D3737-07 recognized by the 2012 IBC and IRC, and 2009 IBC and IRC, respectively
   - ANSI A190.1-2012 recognized by the 2015 IBC and IRC, and ANSI/AITC A190.1-2007 recognized by the 2012 IBC and IRC, and 2009 IBC and IRC, respectively
   - APA Glulam Design Specification, Y117
   - APA Glulam Layup Combinations
   - APA Report T2006P-65A and other qualification data

2. Product description:
   Calvert GL 3000 glulam beams are used as beams, headers, rafters, or purlins, and are manufactured with the EWS 30F-E2M3/SP balanced layup combination using laminated veneer lumber (LVL), as permitted by ANSI A190.1, as the tension and compression laminations, and Southern pine laminations in the remainder of the beam. The LVL laminations are supplied by manufacturers recognized by APA and identified in Calvert's in-plant manufacturing standard approved by APA. The LVL complies with the control values listed in the manufacturing standard and is manufactured in full length and width laminations, and in thicknesses up to 2 inches from wood veneers. All veneer grain is parallel to the length of the billets. The veneers are bonded with exterior-type adhesives, which comply with the requirements of Service Class B (Exterior) of ASTM D2559.

3. Design properties:
   Table 1 lists the design properties for Calvert GL 3000 glulam beams. The allowable loads for Calvert GL 3000 shall be in accordance with the recommendations provided by the manufacturer (www.calvertglulam.com) and EWS Data File: *Glued Laminated Beam Design Tables*, Form S475 (www.apawood.org/resource-library), as applicable.

4. Product installation:
   Calvert GL 3000 glulam beams shall be installed in accordance with the recommendations provided by the manufacturer and EWS Technical Note: *Glulam Connection Details*, Form T300 (see link above). Permissible field notching and drilling shall be in accordance with the recommendations provided by the manufacturer and EWS Technical Note: *Field Notching and Drilling of Glued Laminated Timber Beams*, Form S560 (see link above).

5. Fire-rated assemblies:
   Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer and APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (see link above). For one- or two-hour rated glulam beams, the Calvert GL

3000 glulam beams shall be constructed in accordance with ANSI A190.1 and designed in accordance with the recommendations provided by the manufacturer and APA Technical Note: *Calculating Fire Resistance of Glulam Beams and Columns*, Form Y245 (see link above) or Chapter 16 of the 2015 National Design Specification for Wood Construction (NDS).

6. Limitations:
   a) Calvert GL 3000 glulam beams shall be designed in accordance with the code using the design properties specified in this report or APA Y117 (based on the properties published for the 30F-E2M3 layup combination).
   b) Calvert GL 3000 glulam beams shall have a minimum depth of 7-1/4 inches.
   c) Calvert GL 3000 glulam beams are produced at Calvert Company's facilities in Vancouver and Washougal, Washington, under a quality assurance program audited by APA.
   d) This report is subject to re-examination in one year.

7. Identification:
   Calvert GL 3000 glulam beams described in this report are identified by a label bearing the manufacturer's name (Calvert) and/or trademark, the APA assigned plant number (1010 for the Vancouver, Washington plant or 1035 for the Washougal, Washington plant), the product standard (ANSI A190.1), the APA logo, the report number PR-L269, and a means of identifying the date of manufacture.

Table 1. Design Values for Calvert GL 3000 Glulam Beams for Normal Duration of Load [1,2]

Symbol	Species Outer/ Core[3] (Bal or Unbal[4])	Bending About X-X Axis (Loaded Perpendicular to Wide Faces of Laminations)								Bending About Y-Y Axis (Loaded Parallel to Wide Faces of Laminations)						Axially Loaded		Fasteners	
		Extreme Fiber in Bending[5]		Compression Perpendicular to Grain		Shear Parallel to Grain[6]	Modulus of Elasticity[7]			Extreme Fiber in Bending[8]	Comp. Perpen-dicular to Grain	Shear Parallel to Grain[6]	Modulus of Elasticity[7]			Tension Parallel to Grain	Comp. Parallel to Grain	Specific Gravity for Dowel-Type Fastener Design	
		Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Ten. Face	Comp. Face		True	App-arent	Beam Stabi-lity				True	App-arent	Beam Stabi-lity			Top or Bottom Face	Side Face
		F_{bx}^{+} (psi)	F_{bx}^{-} (psi)	$F_{c\perp x}$ (psi)		F_{vx} (psi)	$E_{x\,true}$ (10^6 psi)	$E_{x\,app}$ (10^6 psi)	$E_{x\,min}$ (10^6 psi)	F_{by} (psi)	$F_{c\perp y}$ (psi)	F_{vy} (psi)	$E_{y\,true}$ (10^6 psi)	$E_{y\,app}$ (10^6 psi)	$E_{y\,min}$ (10^6 psi)	F_t (psi)	F_c (psi)	SG	
Calvert GL 3000[9]	LVL/SP (B)	3000	3000	650[10]	650[10]	300	2.2	2.1	1.11	1750	650	265	1.8	1.7	0.90	1350	1750	0.50	0.50
Wet-use factor		0.8		0.53		0.875	0.833			0.8	0.53	0.875	0.833			0.8	0.73	see NDS	

(1) The combinations in this table are intended primarily for members stressed in bending due to loads applied perpendicular to the wide faces of the laminations. Design values are tabulated, however, for loading both perpendicular and parallel to the wide faces of the laminations.

(2) The tabulated design values are for normal duration of loading. For other durations of loading, see the applicable building code. The tabulated design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the wet-use factors shown at the bottom of the table.

(3) SP = Southern pine; LVL = laminated veneer lumber per the manufacturing standard.

(4) The balance (B) layup is intended primarily for multiple-span or cantilevered beam applications, but may be used in simple-span applications.

(5) The values of F_{bx} are based on members 5-1/8 inches in width by 12 inches in depth by 21 feet in length. For members with a larger volume, F_{bx} shall be multiplied by a volume factor, $C_v = (5.125/b)^{1/10}\,(12/d)^{1/10}\,(21/L)^{1/10}$, where b is the beam width (in.), d is the beam depth (in.), and L is the beam length between the points of zero moment (ft).

(6) For non-prismatic members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3), the F_{vx} and F_{vy} values shall be multiplied by a factor of 0.72. The tabulated F_{vy} values are for timbers with laminations made from a single piece of lumber across the width or multiple pieces that have been edge bonded. For timber manufactured from multiple piece laminations (across width) that are not edge bonded, value shall be multiplied by 0.4 for members with 5, 7, or 9 laminations or by 0.5 for all other members.

(7) The tabulated E values include true E (also known as "shear-free E"), apparent E, and E for beam stability calculation (NDS 3.3.3.8). For calculating beam deflections, the tabulated E_{app} values shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated E_{true}. The axial modulus of elasticity, E_{axial} and $E_{axial\,min}$, shall be equal to the tabulated $E_{y\,true}$ and $E_{y\,min}$ values.

(8) The values of F_{by} are based on members 12 inches in depth. For depths less than 12 inches, F_{by} shall be permitted to be increased by multiplying by the size factor, $(12/d)^{1/9}$, where d is the beam depth in inches. When d is less than 3 inches, use the size adjustment factor for 3 inches.

(9) The beam depths are limited to 7-1/4 to 24 inches.

(10) The values of $F_{c\perp x}$ shall be permitted to be increased to the published allowable compressive stress perpendicular to grain of the outermost laminated veneer lumber in the plank (flatwise) orientation.

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APA – THE ENGINEERED WOOD ASSOCIATION
HEADQUARTERS
7011 So. 19th St. ▪ Tacoma, Washington 98466
Phone: (253) 565-6600 ▪ Fax: (253) 565-7265 ▪ Internet Address: www.apawood.org.

PRODUCT SUPPORT HELP DESK
(253) 620-7400 ▪ *E-mail Address*: help@apawood.org

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