

Nordic Lam™  
Nordic Engineered Wood

PR-L294  
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Products: Nordic Lam™  
Nordic Engineered Wood  
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1. Basis of the product report:
  - 2012 and 2009 International Building Code (IBC): Sections 104.11 Alternative Materials and 2303.1.3 Structural glued laminated timber
  - 2012 and 2009 International Residential Code (IRC): Sections R104.11 Alternative Materials, and R502.1.5, R602.1.2, and R802.1.4 Structural glued-laminated timber
  - ASTM D3737-08 and D3737-07 recognized by the 2012 IBC and IRC, and 2009 IBC and IRC, respectively
  - ANSI/AITC A190.1-07 recognized by the 2012 IBC and IRC, and 2009 IBC and IRC
  - APA Reports T2001P-85, T2003P-21, T2003P-85, T2004P-43, T2006P-45, T2008P-91, and T2009P-39, FPInnovations Reports 201003404, 201003409, and 201005209, and other qualification data
2. Product description:

Nordic Lam™ is a Black Spruce structural glued laminated timber manufactured in accordance with 20F-E8M1, 20F-ES/CPG, 24F-E/ES1M1, 24F-ES/MSR, 24F-ES/NPG, ES11, ES11/NPG, ES12, and ES12/NPG layup combinations developed in accordance with the principle of ASTM D3737. Nordic Lam™ is used as beams, headers, rafters, purlins, columns, studs, and decking, and is manufactured in nominal widths ranging from 1-1/2 to 12 inches, a variety of depths, and lengths up to 80 feet, in accordance with Table 1.
3. Design properties:

Table 2 lists the design properties for Nordic Lam™ beams. The allowable spans for Nordic Lam™ beams shall be in accordance with the recommendations provided by the manufacturer ([www.nordicewp.com/literatures/N-U121NordicLam.pdf](http://www.nordicewp.com/literatures/N-U121NordicLam.pdf)), and with EWS Data File: *Glued Laminated Beam Design Tables*, Form S475 ([www.apawood.org/publications](http://www.apawood.org/publications)), as applicable.

Table 3 lists the design properties for Nordic Lam™ columns. The allowable loads for Nordic Lam™ columns shall be in accordance with the recommendations provided by the manufacturer ([www.nordicewp.com/literatures/N-U231Columns.pdf](http://www.nordicewp.com/literatures/N-U231Columns.pdf)), and with EWS Data File: *Design of Structural Glued Laminated Timber Columns*, Form Y240 ([www.apawood.org/publications](http://www.apawood.org/publications)), as applicable.
4. Product installation:

Nordic Lam™ beams and columns shall be installed in accordance with the recommendations provided by the manufacturer ([www.nordicewp.com/literatures/N-U121NordicLam.pdf](http://www.nordicewp.com/literatures/N-U121NordicLam.pdf)) and EWS Technical Note: *Glulam Connection Details*, Form T300 ([www.apawood.org/publications](http://www.apawood.org/publications)). Permissible field notching and drilling of Nordic Lam™ beams shall be in accordance with the recommendations provided by the manufacturer and with EWS Technical Note: *Field Notching and Drilling of Glued Laminated Timber Beams*, Form S560 ([www.apawood.org/publications](http://www.apawood.org/publications)).

Permissible field notching and drilling of Nordic Lam™ columns shall be in accordance with the recommendations provided by the manufacturer.

5. Fire-rated assemblies:  
 Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer (see link above).
6. Limitations:
  - a) Nordic Lam™ beams and columns shall be designed in accordance with the code using the design properties specified in this report.
  - b) The dimensions of Nordic Lam™ beams and columns shall follow those specified in Table 1.
  - c) Nordic Lam™ beams and columns shall be manufactured in accordance with layup combinations specified in APA *Glulam Layup Combinations*, Form Y117 SUP ([www.apawood.org/publications](http://www.apawood.org/publications)) or proprietary Nordic Lam™ manufacturing specifications documented in the in-plant manufacturing standard approved by APA.
  - d) Nordic Lam™ is produced at the Nordic Engineered Wood, Chibougamau, Quebec facilities under a quality assurance program audited by APA.
  - e) This report is subject to re-examination in one year.
7. Identification:  
 Nordic Lam™ described in this report is identified by a label bearing the manufacturer's name (Nordic Engineered Wood) and/or trademark, the APA assigned plant number (1057), the product standard (ANSI/AITC A190.1), the APA logo, the combination symbol, the report number PR-L294, and a means of identifying the date of manufacture.

Table 1. Dimensions for Nordic Lam™ layups.

Layup	Minimum width, b (in.)	Maximum width, b (in.)	Minimum depth	Maximum depth, h (in.)
20F-E8M1	1-1/2	7-1/2	4 lams	18
20F-ES/CPG	3-1/8 <sup>(1)</sup>	3-1/2	4 lams	18
24F-E/ES1M1	1-1/2	7-1/2	4 lams	36 <sup>(2)</sup>
24F-ES/MSR	3-1/8	3-1/2	4 lams	36 <sup>(2)</sup>
24F-ES/NPG	1-1/2	12	4 lams	NA <sup>(2)</sup>
ES11	1-1/2	7-1/2	2 lams	15
ES11/NPG	1-1/2	7-1/2	2 lams	15
ES12	1-1/2	7-1/2	2 lams	15
ES12/NPG	1-1/2	12	2 lams	54 <sup>(2)</sup>

<sup>(1)</sup> The minimum width shall be permitted to be 1-1/2 inches when 24F-ES/NPG is trademarked as 20F-ES/CPG.

<sup>(2)</sup> The maximum depth shall not exceed the tabulated depth or a depth-to-width ratio of 12:1, whichever is smaller.

Table 2. Design Values for Nordic Lam™ Beams for Normal Duration of Load<sup>(1)</sup>

Symbol	Species <sup>(2)</sup> Outer/ Core	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 <sup>(3)</sup>		Compression Perpendicular to Grain		Shear Parallel to Grain <sup>(4)</sup>	Modulus of Elasticity <sup>(5)</sup>		Extreme Fiber in Bending <sup>(6)</sup>	Compr. Perpendicular to Grain	Shear Parallel to Grain <sup>(4)</sup>	Modulus of Elasticity <sup>(5)</sup>		Tension Parallel to Grain	Compr. 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)	Tension Face	Compr. Face											Top or Bottom Face	Side Face
		F <sub>bx</sub> <sup>+</sup> (psi)	F <sub>bx</sub> <sup>-</sup> (psi)	F <sub>cLx</sub> (psi)		F <sub>vx</sub> (psi)	E <sub>x</sub> (10 <sup>6</sup> psi)	E <sub>x,min</sub> (10 <sup>6</sup> psi)	F <sub>by</sub> (psi)	F <sub>cLy</sub> (psi)	F <sub>vy</sub> (psi)	E <sub>y</sub> (10 <sup>6</sup> psi)	E <sub>y,min</sub> (10 <sup>6</sup> psi)	F <sub>t</sub> (psi)	F <sub>c</sub> (psi)	SG	
20F-E8M1	ES/ES	2,000	2,000	450	450	250	1.5	0.79	1050	315	175	1.4	0.74	800	1,000	0.41	0.41
20F-ES/CPG	ES/ES	2,000	2,000	450	450	250	1.8	0.95	2,000	450	250	1.8	0.95	800	1,000	0.41	0.41
24F-E/ES1M1	ES/ES	2,400	2,400	560	560	250	1.8	0.95	1,100	300	175	1.5	0.79	1,050	1,150	0.41	0.41
24F-ES/MSR	ES/ES	2,400	2,400	560	560	250	1.8	0.95	1,100	300	175	1.5	0.79	1,050	1,150	0.41	0.41
24F-ES/NPG	ES/ES	2,400	2,400	560	560	250	1.8	0.95	2,400	560	250	1.8	0.95	1,600	2,300	0.46	0.46
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	

<sup>(1)</sup> 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.  
<sup>(2)</sup> ES = Eastern spruce.  
<sup>(3)</sup> The values of F<sub>bx</sub> 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<sub>bx</sub> shall be multiplied by a volume factor, C<sub>v</sub>, determined in accordance with applicable building code using 1/10 as the exponent.  
<sup>(4)</sup> 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<sub>vx</sub> and F<sub>vy</sub> values shall be multiplied by a factor of 0.72.  
<sup>(5)</sup> The tabulated E values already include a 5% shear deflection (also known as "apparent E"). The axial modulus of elasticity, E<sub>axial</sub> and E<sub>axial,min</sub>, shall be calculated by multiplying E<sub>y</sub> and E<sub>y,min</sub> by 1.05.  
<sup>(6)</sup> The values of F<sub>by</sub> are based on members 12 inches in depth. For depths less than 12 inches, F<sub>by</sub> shall be permitted to be increased by multiplying by the size factor, (12/d)<sup>1/9</sup>, where d is the beam depth in inches. When d is less than 3 inches, use the size adjustment factor for 3 inches.

Table 3. Design Values Nordic Lam™ Columns for Normal Duration of Load<sup>(1)</sup>

Combination Symbol	Species <sup>(2)</sup>	Grade	All Loading			Axially Loaded			Bending about Y-Y Axis				Bending about X-X Axis	
			Modulus of Elasticity <sup>(3)</sup>		Compression Perpendicular to Grain	Tension Parallel to Grain	Compression Parallel to Grain		Loaded Parallel to Wide Faces of Laminations			Loaded Perpendicular to Wide Faces of Laminations		
			E (10 <sup>6</sup> psi)	E <sub>min</sub> (10 <sup>6</sup> psi)			F <sub>c⊥</sub> (psi)	F <sub>t</sub> (psi)	F <sub>c</sub> (psi)	F <sub>c</sub> (psi)	Bending <sup>(4)</sup>			Shear Parallel to Grain <sup>(5,6)</sup>
					2 or More Lams	4 or More Lams					2 or 3 Lams	4 or More Lams	3 Lams	
		F <sub>vy</sub> (psi)	F <sub>vy</sub> (psi)	F <sub>vy</sub> (psi)	F <sub>vy</sub> (psi)	F <sub>bx</sub> (psi)	F <sub>vx</sub> (psi)							
ES 11	ES	C4	1.5	0.79	450	975	1,550	1,350	1,750	1,600	1,400	175	1,350 <sup>(8)</sup>	250
ES 11/NPG	ES	NPG	1.5	0.79	450	975	1,550	1,350	1,750	1,600	1,400	175	1,350	250
ES 12	ES	1.9E6	1.8	0.95	560	1,600	2,300	1,700	2,400	2,400	2,300	175	1,950 <sup>(8)</sup>	250
ES 12/NPG	ES	NPG	1.8	0.95	560	1,600	2,300	1,700	2,400	2,400	2,300	250	2,400	250
Wet-use factors			0.833		0.53	0.8	0.73		0.8			0.875	0.8	0.875

- <sup>(1)</sup> The tabulated design values are for normal duration of loading. For other durations of loading, see applicable building code. The tabulated design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the factors shown at the bottom of the table.
- <sup>(2)</sup> ES = Eastern spruce.
- <sup>(3)</sup> The tabulated E values already include a 5% shear deflection (also known as "apparent E"). The axial modulus of elasticity (E<sub>axial</sub> and E<sub>axial min</sub>) shall be permitted to be calculated by multiplying the tabulated E and E<sub>min</sub> by 1.05.
- <sup>(4)</sup> The values of F<sub>by</sub> are based on members 12 inches in depth. For depths less than 12 inches, F<sub>by</sub> shall be permitted to be increased by multiplying by the size factor, (12/d)<sup>1/5</sup>, where d is the beam depth in inches. When d is less than 3 inches, use the size adjustment factor for 3 inches.
- <sup>(5)</sup> For non-prismatic members, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3), the tabulated F<sub>vx</sub> and F<sub>vy</sub> values shall be multiplied by 0.72.
- <sup>(6)</sup> The tabulated F<sub>vy</sub> values are for members of 4 or more lams. The tabulated F<sub>vy</sub> values shall be multiplied by a factor of 0.95 for 3 lams and 0.84 for 2 lams.
- <sup>(7)</sup> The values of F<sub>bx</sub> 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<sub>bx</sub> shall be multiplied by a volume factor, C<sub>v</sub>, determined in accordance with applicable building code using 1/10 as the exponent.
- <sup>(8)</sup> When the member depth is greater than 15 inches, the tabulated F<sub>bx</sub> values shall be multiplied by a factor of 0.88.

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**APA – THE ENGINEERED WOOD ASSOCIATION**

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