APA PRODUCT REPORT®

Nordic X-Lam **PR-L306**
Nordic Structures Revised June 17, 2026

Products: Nordic X-Lam
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1. Basis of the product report:
   - 2024, 2021, 2018, and 2015 International Building Code (IBC): Section 2303.1.4 Cross-laminated timber (Structural glued cross-laminated timber in 2021, 2018, and 2015 IBC)
   - 2024, 2021, 2018, and 2015 International Residential Code (IRC): Sections R502.1.6, R602.1.6, and R802.1.5 (R802.1.6 in 2021, 2018, and 2015 IRC) Cross-laminated timber
   - ANSI/APA PRG 320-2025 Standard for Performance-Rated Cross-Laminated Timber
   - ANSI/APA PRG 320-2019, PRG 320-2017, PRG 320-2012, and PRG 320-2011 recognized in the 2024 and 2021 IBC and IRC, 2018 IBC and IRC, 2015 IRC, and 2015 IBC, respectively
   - 2024, 2018, and 2015 ANSI/AWC NDS, National Design Specification for Wood Construction recognized in the 2024 IBC and IRC, 2021 and 2018 IBC and IRC, and 2015 IBC and IRC, respectively
   - 2021 ANSI/AWC SDPWS, Special Design Provisions for Wind and Seismic recognized in the 2024 and 2021 IBC, respectively
   - FPInnovations Reports 201002775, 201004981, 301010401, 301010956, and 301011903, HPVA Report T-14054R, and other qualification data

2. Product description:
   Nordic X-Lam cross-laminated timber (CLT) is manufactured with Spruce-Pine-Fir (mainly Black Spruce) lumber in accordance with the E1 or custom layups of ANSI/APA PRG 320 through product qualification and/or mathematical models using principles of engineering mechanics. Nordic X-Lam panels can be used in floor, roof, and wall applications, and is manufactured in a plank billet with nominal widths of 12 to 106-1/4 inches, thicknesses of 3 to 15 inches, and lengths up to 64 feet.

3. Design properties:
   Nordic X-Lam CLT shall be designed with the design properties and capacities provided in Tables 1, 2, and 3, or with the allowable load table provided by the manufacturer (www.nordic.ca/en/documentation/technical-documents). Note that the unbalanced layup listed in Tables 2 and 3, E1/140-4l, shall be stamped with the word “TOP” on the side that contains a single outermost layer in the major strength direction. The design adjustment factors shall be based on Table 10.3.1 of the ANSI/AWC National Design Specification for Wood Construction (NDS) and approved by the engineer of record. The lateral resistance of Nordic X-Lam CLT, when used as shear walls or diaphragms, depends on the panel-to-panel connection and anchorage designs, and shall be designed in accordance with Sections 4.5 and 4.6 of the ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS), or consulted with the CLT manufacturer and approved by the engineer of record.

   Design values for the Load and Resistance Factor Design (LRFD) used in the U.S. for Nordic X-Lam CLT can be derived from the ASD values published in Tables 2 and 3 of this report in accordance with Tables 10.3.1, N1, N2, and N3 of the NDS.

4. Product installation:
   Nordic X-Lam CLT shall be installed in accordance with the recommendations provided by the manufacturer (see link above) and the engineering drawing approved by the engineer of record. Permissible details shall be in accordance with the engineering drawing.

5. Fire-rated assemblies:
   Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer (see link above). Procedures specified in Chapter 16 of the NDS shall be permitted for use in designing Nordic X-Lam CLT for a fire exposure up to 2 hours.

   Nordic X-Lam CLT has been tested in accordance with ASTM E84 and meets the Class A rating for flame spread index (0 – 25) and smoke-developed index (0 – 450) when the thickness is at least 3-1/2 inches (89 mm). The Class B rating for flame spread index (26 – 75) and smoke-developed index (0 – 450) shall be applicable to Nordic X-Lam with a thickness that is less than 3-1/2 inches (89 mm). These values apply to Nordic X-Lam without surface treatment (e.g., protective coatings, sealants, primers, stains, etc.). For flame-spread ratings and smoke developed classifications with a surface treatment, refer to the manufacturer.

6. Limitations:
   a) Nordic X-Lam CLT shall be designed in accordance with the applicable code and the National Design Specification for Wood Construction using the allowable design properties specified in this report.
   b) Nordic X-Lam products shall be limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16%.
   c) Design properties for Nordic X-Lam CLT, when used as beams or lintels with loads applied parallel to the face-bond gluelines, other than the edgewise shear properties (see Table 3), are beyond the scope of this report. The edgewise shear properties are applicable only to products manufactured at the Nordic Structures, Chibougamau, Quebec facility.
   d) Nordic X-Lam CLT shall be manufactured in accordance with layup combinations specified in ANSI/APA PRG 320 or custom Nordic X-Lam CLT manufacturing specifications documented in the in-plant manufacturing standard approved by APA.
   e) Nordic X-Lam CLT is produced at the Nordic Structures, Chibougamau, Quebec facility under a quality assurance program audited by APA.
   f) This report is subject to re-examination in one year.

7. Identification:
   Nordic X-Lam CLT described in this report is identified by a label bearing the manufacturer's name (Nordic Structures) and/or trademark, the APA assigned plant number (1112 for Chibougamau, Quebec), the product standard (ANSI/APA PRG 320), the APA logo, the CLT grade, the report number PR-L306, and a means of identifying the date of manufacture.

Table 1. ASD Reference Design Values[a] for Lumber Laminations Used in Nordic X-Lam (for Use in the U.S.)

CLT Grade	Laminations Used in Major Strength Direction									Laminations Used in Minor Strength Direction								
	Grade & Species	F_b (psi)	E (10^6 psi)	F_t (psi)	F_c (psi)	F_v (psi)	F_s (psi)	$F_{c\perp}$ (psi)	G	Grade & Species	F_b (psi)	E (10^6 psi)	F_t (psi)	F_c (psi)	F_v (psi)	F_s (psi)	$F_{c\perp}$ (psi)	G
E1	1950f-1.7E SPF	1,950	1.7	1,375	1,800	135	45	425	0.42	No.3 SPF	500	1.2	250	650	135	45	425	0.42

For SI: 1 psi = 0.006895 MPa

[a] Tabulated values are allowable design values and not permitted to be increased for the lumber size adjustment factor in accordance with the NDS. The design values shall be used in conjunction with the section properties provided by the CLT manufacturer based on the actual layup used in manufacturing the CLT panel (see Table 2).

Table 2. ASD Flatwise Bending Reference Design Values[a,b,c] for Nordic X-Lam Listed in Table 1 (for Use in the U.S.)

CLT Grade[d]	Layup ID[e]	Thick-ness, t_p (in.)	Lamination Thickness (in.) in CLT Layup							Major Strength Direction				Minor Strength Direction			
			=	⊥	=	⊥	=	⊥	=	$(F_bS)_{eff,f,0}$ (lbf-ft/ft)	$(EI)_{eff,f,0}$ (10^6 lbf-in.^{2}/ft)	$(GA)_{eff,f,0}$ (10^6 lbf/ft)	$V_{s,0}$ (lbf/ft)	$(F_bS)_{eff,f,90}$ (lbf-ft/ft)	$(EI)_{eff,f,90}$ (10^6 lbf-in.^{2}/ft)	$(GA)_{eff,f,90}$ (10^6 lbf/ft)	$V_{s,90}$ (lbf/ft)
E1	78-3s	3 1/8	1 1/64	1 1/16	1 1/64					2,525	48	0.34	1,110	95	1.4	0.47	380
	89-3s	3 1/2	1 3/8	3/4	1 3/8					3,350	72	0.48	1,260	45	0.51	0.39	270
	105-3s	4 1/8	1 3/8	1 3/8	1 3/8					4,525	115	0.46	1,490	160	3.1	0.61	495
	131-5s	5 1/8	1 1/64	1 1/16	1 1/64	1 1/16	1 1/64			5,800	184	0.69	1,860	790	36	0.94	1,130
	140-4s	5 1/2	1 3/8	1 3/8 x2	1 3/8					7,325	248	0.54	1,980	630	25	1.2	990
	140-4l[f]	5 1/2	1 3/8 x2	1 3/8	1 3/8					7,150	261	0.70	1,980	160	3.1	0.67	495
	143-5s	5 5/8	1 3/8	3/4	1 3/8	3/4	1 3/8			7,725	267	0.96	2,030	615	26	0.78	1,040
	175-5s	6 7/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8			10,400	440	0.92	2,480	1,370	81	1.2	1,490
	197-7s	7 3/4	1 3/8	3/4	1 3/8	3/4	1 3/8	3/4	1 3/8	13,725	654	1.4	2,800	1,410	101	1.2	1,800
	213-7l	8 3/8	1 3/8 x2	3/4	1 3/8	3/4	1 3/8 x2			18,700	963	1.6	3,025	615	26	0.93	1,040
	220-7s	8 5/8	1 3/8	1 1/16	1 3/8	1 1/16	1 3/8	1 1/16	1 3/8	15,975	853	1.4	3,125	2,190	187	1.5	2,130
	245-7s	9 5/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	18,375	1,089	1.4	3,475	3,150	313	1.8	2,480
	245-7l	9 5/8	1 3/8 x2	1 3/8	1 3/8	1 3/8	1 3/8 x2			23,700	1,404	1.4	3,475	1,370	81	1.3	1,490
	267-9l	10 1/2	1 3/8 x2	3/4	1 3/8	3/4	1 3/8	3/4	1 3/8 x2	28,325	1,831	2.0	3,775	1,410	101	1.3	1,800
	315-9l	12 3/8	1 3/8 x2	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8 x2	36,700	2,794	1.8	4,450	3,150	313	1.9	2,480

For SI: 1 in. = 25.4 mm; 1 ft = 304.8 mm; 1 lbf = 4.448 N

[a] Tabulated values are allowable design values and not permitted to be increased for the lumber size adjustment factor in accordance with the NDS.
[b] Reference design values must be adjusted, as applicable, in accordance with Section 10.3 of the NDS.
[c] Deflection under a specified uniformly distributed load, w, acting perpendicular to the face of a single-span CLT panel shall be permitted to be calculated as a sum of the deflections due to moment and shear effects using the effective bending stiffness, $(EI)_{eff}$, and the effective in-plane (planar) shear rigidity, $(GA)_{eff}$, as follows:

$$\delta = \frac{22.5wL^4}{(EI)_{eff}} + \frac{9wL^2}{5(GA)_{eff}} \quad [1]$$

where: δ = estimated deflection, inches;
L = span, feet;
$(GA)_{eff}$ = tabulated effective in-plane (planar) shear rigidity, lbf/ft.
w = uniform load, lbf/ft^2;
$(EI)_{eff}$ = tabulated effective bending stiffness, lbf-in.^{2}/ft; and

For a concentrated load, P, located in the middle of a single span CLT panel acting perpendicular to the panel, the deflection shall be permitted to be calculated as follows:

$$\delta = \frac{36PL^3}{(EI)_{eff}} + \frac{18PL}{5(GA)_{eff}} \quad [2]$$

where: δ = estimated deflection, inches;
L = span, feet;
$(GA)_{eff}$ = tabulated effective in-plane (planar) shear rigidity, lbf/ft.
P = concentrated load, lbf/ft of width;
$(EI)_{eff}$ = tabulated effective bending stiffness, lbf-in.^{2}/ft; and

(d) The CLT layups are developed based on ANSI/APA PRG 320, as permitted by the standard.
(e) The layup designation refers to the panel thickness (expressed in mm), the number of layers, and the layup combination ("s" for standard perpendicular layers, and "l" for doubled outermost parallel layers).
(f) This layup is not balanced (the top and bottom layers are different in the layer thickness). The side that contains a single outermost layer in the major strength direction must be stamped with the word "TOP."

Table 3. ASD Edgewise Bending Reference Design Values[a] for Nordic X-Lam Listed in Table 1 (for Use in the U.S.)

CLT Grade	Layup ID	Thickness, t_p (in.)	Major Strength Direction		Minor Strength Direction	
			$F_{v,e,0}$[b] (psi)	$G_{e,0}\,t_p$[e] (10^6 lbf/ft)	$F_{v,e,90}$[b] (psi)	$G_{e,90}\,t_p$[e] (10^6 lbf/ft)
E1	78-3s	3 1/8	155[c]	1.36	190[c]	1.36
	89-3s	3 1/2	155	1.52	190[c]	1.52
	105-3s	4 1/8	155	1.79	190	1.79
	131-5s	5 1/8	185[d]	2.23	215[d]	2.23
	140-4s	5 1/2	145	2.39	190[c]	2.39
	140-4l	5 1/2	155[c]	2.39	190[c]	2.39
	143-5s	5 5/8	185[d]	2.44	215[d]	2.44
	175-5s	6 7/8	185	2.99	215	2.99
	197-7s	7 3/4	155[c]	3.37	215[d]	3.37
	213-7l	8 3/8	185[d]	3.64	215[d]	3.64
	220-7s	8 5/8	185[d]	3.75	215[d]	3.75
	245-7s	9 5/8	185[d]	4.18	215[d]	4.18
	245-7l	9 5/8	185[d]	4.18	215[d]	4.18
	267-9l	10 1/2	155[c]	4.56	215[d]	4.56
	315-9l	12 3/8	185[d]	5.38	215[d]	5.38

For SI: 1 psi = 0.006895 MPa

[a] Reference design values must be adjusted, as applicable, in accordance with Section 10.3 of the NDS.
[b] Allowable edgewise in-plane shear stress, which shall be used in conjunction with the CLT thickness, t_p, to determine the in-plane shear capacities. If the net CLT thickness is less than the full CLT thickness, the in-plane shear capacities shall be calculated based on the net CLT thickness.
[c] Based on test results from 105-3s.
[d] Based on test results from 175-5s.
[e] Edgewise shear rigidity is based on $G_{e,0}$ and $G_{e,90}$ = 36,200 psi and the CLT thickness, t_p, in accordance with product performance testing.

APA – The Engineered Wood Association is an approved national standards developer accredited by American National Standards Institute (ANSI). APA publishes ANSI standards and Voluntary Product Standards for wood structural panels and engineered wood products. APA is an accredited certification body under ISO/IEC 17065 by Standards Council of Canada (SCC), an accredited inspection agency under ISO/IEC 17020 by ANSI National Accreditation Board (ANAB), and an accredited testing organization under ISO/IEC 17025 by ANAB. APA is also an approved Product Certification Agency, Testing Laboratory, Quality Assurance Entity, Validation Entity, and Product Evaluation Entity by the State of Florida, and an approved testing laboratory by City of Los Angeles.

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