NORDIC LAM™

COLUMNS

Built for life

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NORDIC LAM™
ES12 COLUMNS

AXIAL RESISTANCES (lbs)

EFFECTIVE COLUMN LENGTH (ft)	LAMINATION NET WIDTH = 3-1/2 in.			NET WIDTH = 5-1/2 in.		= 7 in.
	NET DEPTH			NET DEPTH		NET DEPTH
	3-1/2 in	5-1/2 in.	7 in.	5-1/2 in.	7 in.	7 in.
6	15,244	26,074	33,185	57,899	73,690	102,522
7	12,921	21,763	27,698	52,912	67,258	96,211
8	10,867	18,096	23,031	47,853	60,530	89,704
9	9110	15,042	19,145	42,898	54,161	83,151
10	7631	12,519	15,934	38,204	48,279	76,698
11	6396	10,439	13,280	33,954	42,940	70,469
12	5367	8722	11,084	30,150	38,152	64,556
13	4513	7304	9276	26,768	33,891	59,015
14	3803	6132	7786	23,774	30,113	53,875
15	---	---	---	21,128	26,772	49,144
16	---	---	---	18,791	23,818	44,810
17	---	---	---	16,726	21,207	40,855
18	---	---	---	14,901	18,897	37,254
19	---	---	---	13,286	16,853	33,979
20	---	---	---	11,857	15,044	31,002
21	---	---	---	10,593	13,443	28,297
22	---	---	---	9474	12,026	25,838
23	---	---	---	---	---	23,603
24	---	---	---	---	---	21,572

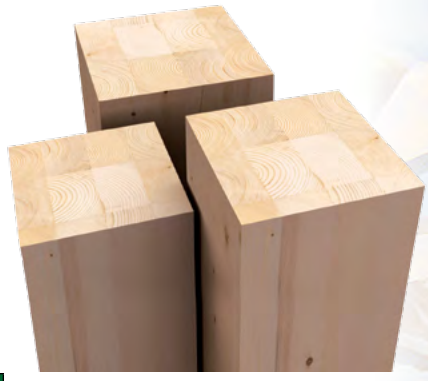
ALLOWABLE BEARING LOADS (lbs)

SPECIES OR GRADE	BEARING AREA (in.^{2})					
	12.25	19.25	24.50	30.25	38.50	49.00
	3-1/2 in. x 3-1/2 in. =	3-1/2 in. x 5-1/2 in. =	3-1/2 in. x 7 in. =	5-1/2 in. x 5-1/2 in. =	3-1/2 in. x 7 in. =	7 in. x 7 in. =
D. Fir-L	11,442	17,980	22,884	28,255	35,961	45,768
Hem-Fir	7,519	11,816	15,038	18,567	23,631	30,076
S-P-F	8,663	13,614	17,327	21,393	27,227	34,653
Northern	5,721	8,990	11,442	14,127	17,980	22,884
ES11	9,481	14,898	18,961	23,411	29,796	37,922
24F-1.9E	12,259	19,265	24,519	30,273	38,529	49,037

NOTES:

1. Values shown in the above table are the maximum axial loads, in pounds (lbs), that can be applied to the column in addition to its own weight. Values shown in the table below are the maximum bearing loads, in pounds (lbs).
2. The tabulated axial resistances are based on simply axially loaded columns subjected to a maximum eccentricity of either 1/6 column width or 1/6 column depth, whichever is worse. For side loads, other eccentric end loads, or other combined axial and flexural loads, see CSA O86-09.
3. The tabulated bearing resistances are based on the compression perpendicular to grain resistance of the supporting material.
4. The values are based on standard term duration of load and dry-use conditions. The bearing resistances shall not be increased by any load duration factor.
5. The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
6. These values are for preliminary design use only. Final design should include a complete analysis, including bearing resistance of the foundation supporting the column. When the column is used in a wall system, review bearing resistance requirements above to ensure adequacy.

DESIGN VALUES
FOR NORDIC LAM™



SPECIFIED STRENGTHS AND DESIGN PROPERTIES (1,2,3)

APPLICATION	COLUMNS
APPEARANCE GRADE	INDUSTRIAL
STRESS GRADE	ES12
EWS LAYUP	ES12/NPG
Bending About X-X Axis	
Bending at extreme fibre (F_{bx})(4,5)	4453 psi
Longitudinal shear (F_{vx})(6)	319 psi
Compression perpendicular to grain (F_{cpx})(7)	1088 psi
Shear-free modulus of elasticity (E_x)	1.9E+06 psi
Apparent modulus of elasticity ($E_{x,app.}$)(8)	1.8E+06 psi
Bending About Y-Y Axis	
Bending at extreme fibre (F_{by})(5)	4453 psi
for 3 laminations	4453 psi
Longitudinal shear (F_{vy})(6)	319 psi
Compression perpendicular to grain (F_{cpy}) (7)	1088 psi
Shear-Free modulus of elasticity (E_y)	1.9E+06 psi
Apparent modulus of elasticity ($E_{y,app.}$)(8)	1.8E+06 psi
Axially Loaded	
Compression parallel to grain (F_c)	4786 psi
for 3 laminations	3539 psi
Tension parallel to grain (F_t)	2959 psi
Tension perpendicular to grain (F_{tp})	74 psi
Modulus of elasticity (E_a)(8)	1.9E+06 psi
Mean relative density	0.47
Density *(for member weight)*	35 pcf

(1) The combinations in this table are applicable to members consisting of 4 or more laminations, unless otherwise noted (3-lamination applies to 3-1/2 x 3-1/2 in. columns).

(2) The tabulated design values are for dry service conditions. For wet service conditions, multiply the tabulated values by the wet service condition factors, K_S, per CSA O86-09, Clause 6.4.2.

(3) The tabulated design values are for standard term duration of load. For other durations of load, see applicable design code (CSA O86-09, Clauses 4.3.2 and 6).

(4) Nordic Lam bending members are symmetrical throughout the depth of the member (balanced layups). Vertically glued-laminated beams shall be designed using the specified strengths and modulus of elasticity for bending about Y-Y axis. (Clause 6.5.3 of CSA O86-09 is not applicable.)

(5) The tabulated specified strengths in bending (F_{bx} and F_{by}) shall be multiplied by a size factor, K_{Zbg}. The size factor formula is: $K_{Zbg} = 1.03\ (BL)^{-0.18} \leq 1.0$, where B = net beam width (m), and L = length of beam segment from point of zero moment to point of zero moment (m).

(6) At the location of notches in rectangular members, the specified strength in shear (F_v) shall be multiplied by a notch factor, K_N, determined per CSA O86-09, Clause 6.5.7.2.2.

(7) The compression perpendicular to grain strength values (F_{cpx}) shall be permitted to be adjusted by a size factor for bearing, K_{Zcp}, per CSA O86-09, Clause 6.5.9.2.

(8) The tabulated apparent E values already include a 5% shear deflection. For column stability calculations, E_{05} shall be determined by multiplying the tabulated apparent modulus of elasticity by 0.87.

(9) Design of glulam members shall be in accordance to CSA O86-09 Standard.

Refer to Nordic Lam Design and Construction Guide for more information.
Nordic Lam products are listed in APA Product Report PR-L294C and CCMC Evaluation Report 13216-R.

NORDIC ENGINEERED WOOD

Sustainable Wood Solutions

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