NORDIC LAM™

COLUMNS

Built for life

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NORDIC LAM™
ES12 COLUMNS

ALLOWABLE AXIAL LOADS (lbs)

EFFECTIVE COLUMN LENGTH (ft)	LAMINATION NET WIDTH = 3-1/2 in.								
	NET DEPTH = 3-1/2 in.			NET DEPTH = 5-1/2 in.			NET DEPTH = 7 in.		
	LOAD DURATION FACTOR			LOAD DURATION FACTOR			LOAD DURATION FACTOR		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
6	9752	10,485	10,905	16,859	17,884	18,472	21,461	22,766	23,515
7	8311	8789	9060	13,988	14,664	15,052	17,807	18,668	19,162
8	7037	7364	7550	11,666	12,138	12,410	14,851	15,453	15,798
9	5980	6216	6350	9825	10,169	10,366	12,507	12,945	13,197
10	5120	5296	5397	8361	8620	8768	10,644	10,973	11,162
11	4421	4556	4633	7187	7386	7500	9149	9403	9548
12	3847	3953	4014	6233	6390	6480	7935	8135	8249
13	3374	3458	3507	5451	5577	5648	6939	7099	7191
14	2978	3047	3086	4802	4904	4962	6113	6243	6317
15	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---

See notes on page 3.

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	7656	12,031	15,313	18,906	24,063	30,625
Hem-Fir	4961	7796	9923	12,251	15,593	19,845
S-P-F	5206	8181	10,413	12,856	16,363	20,825
S. Pine	6921	10,876	13,843	17,091	21,753	27,685
ES11	5513	8663	11,025	13,613	17,325	22,050
24F-1.9E	7350	11,550	14,700	18,150	23,100	29,400

NOTES:

1. The tabulated allowable bearing loads are based on the compression perpendicular to grain capacity of the supporting material.
2. The allowable bearing loads shall not be increased by any load duration factor.

ALLOWABLE AXIAL LOADS (lbs) (continued)

EFFECTIVE COLUMN LENGTH (ft)	LAMINATION NET WIDTH = 5-1/2 in.						LAMINATION NET WIDTH = 7 in.		
	NET DEPTH = 5-1/2 in.			NET DEPTH = 7 in.			NET DEPTH = 7 in.		
	LOAD DURATION FACTOR			LOAD DURATION FACTOR			LOAD DURATION FACTOR		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
6	35,289	39,220	41,663	46,624	51,800	55,010	62,256	70,155	75,221
7	32,747	35,617	37,507	42,859	46,969	49,433	59,246	66,233	70,635
8	29,464	31,864	33,267	38,818	41,927	43,737	55,884	61,889	65,587
9	26,435	28,237	29,280	34,747	37,060	38,392	52,239	57,239	60,239
10	23,577	24,951	25,745	30,916	32,666	33,672	48,408	52,455	54,830
11	21,006	22,080	22,699	27,483	28,841	29,622	44,527	47,760	49,633
12	18,752	19,608	20,101	24,483	25,561	26,181	40,756	43,349	44,846
13	16,793	17,487	17,887	21,886	22,757	23,258	37,223	39,330	40,546
14	15,095	15,667	15,995	19,642	20,357	20,768	33,991	35,730	36,733
15	13,623	14,098	14,371	17,701	18,295	18,636	31,077	32,530	33,368
16	12,341	12,741	12,971	16,015	16,515	16,801	28,465	29,693	30,401
17	11,221	11,561	11,755	14,546	14,969	15,212	26,131	27,178	27,781
18	10,238	10,529	10,696	13,259	13,621	13,829	24,044	24,945	25,463
19	9372	9623	9767	12,127	12,439	12,618	22,177	22,958	23,406
20	8606	8824	8948	11,127	11,398	11,552	20,503	21,184	21,574
21	7925	8115	8224	10,239	10,476	10,611	18,999	19,596	19,938
22	7317	7484	7579	9448	9656	9774	17,644	18,170	18,471
23	---	---	---	---	---	---	16,419	16,886	17,152
24	---	---	---	---	---	---	15,310	15,725	15,962

NOTES:

1. Values shown are the maximum axial loads, in pounds (lbs), that can be applied to the column in addition to its own weight.
2. The tabulated allowable loads 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 NDS 2012.
3. The values are based on a load duration factor, C_D, of 1.00 (floor load), 1.15 (snow load) or 1.25 (construction load), and dry service conditions.
4. The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
5. These values are for preliminary design use only. Final design should include a complete analysis, including bearing capacity of the foundation supporting the column. When the column is used in a wall system, review bearing capacity requirements on page 2 to ensure adequacy.

DESIGN VALUES
FOR NORDIC LAM™

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 Fiber (F_{bx})(4,5)	2400 psi
Longitudinal Shear (F_{vx})(6)	250 psi
Compression Perpendicular to Grain (F_{cpx})	600 psi
Shear-Free Modulus of Elasticity (E_x)	1.9E+06 psi
Apparent Modulus of Elasticity ($E_{x,app.}$)(7)	1.8E+06 psi
Bending About Y-Y Axis	
Bending at Extreme Fiber (F_{by})(8)	2400 psi
for 3 laminations	2400 psi
Longitudinal Shear (F_{vy})(6)	250 psi
Compression Perpendicular to Grain (F_{cpy})	600 psi
Shear-Free Modulus of Elasticity (E_y)	1.9E+06 psi
Apparent Modulus of Elasticity ($E_{y,app.}$)(7)	1.8E+06 psi
Axially Loaded	
Compression Parallel to Grain (F_c)	2300 psi
for 3 laminations	1700 psi
Tension Parallel to Grain (F_t)	1600 psi
Modulus of Elasticity (E_a)(7)	1.9E+06 psi
Specific Gravity	0.46
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 laminations apply to 3-1/2 x 3-1/2 in. columns).

(2) The tabulated design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the wet service factors, C_M, per ANSI/AWC NDS-2012, 5.3.3.

(3) The tabulated design values are for normal duration of loading. For other durations of loading, see applicable design code (ANSI/AWC NDS-2012, 2.3.2 and Chapter 5).

(4) Nordic Lam bending members are symmetrical throughout the depth of the member (balanced layups).

(5) The tabulated design values in bending, F_{bx}, shall be multiplied by a volume factor, C_v. The volume factor formula is: $C_v = (12/d)^{1/10} \times (5.125/b)^{1/10} \times (21/L)^{1/10} \leq 1.0$, where d = beam depth (in.), b = beam width (in.), and L = beam length (ft).

(6) For non-prismatic members, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (ANSI/AWC NDS-2012, 3.4.3.3), the design value for shear (F_{vx} and F_{vy}) shall be multiplied by a factor of 0.72.

(7) The tabulated apparent E values already include a 5% shear deflection. For beam stability and column stability calculations, E_{min} shall be determined by multiplying the tabulated apparent modulus of elasticity by 0.528.

(8) The F_{by} values shall be permitted to be increased by multiplying by the size factor, $(12/d)^{1/9}$, where d is the beam depth in inches.

(9) Design of glulam members shall be in accordance to National Design Specification, 2012 Edition.

Refer to Nordic Lam Design and Construction Guide for more information.
Nordic Lam products are listed in APA Product Report PR-L294.

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Sustainable Wood Solutions

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N-U231 / June 2013
Printed in Canada on recycled paper