Nordic X-Lam Panels - Axial Loads

CHECKLIST: **Nordic X-Lam Panels**

To verify that the tabulated maximum axial uniform loads are appropriate for the structure being designed, the following questions should be asked (the appropriate modification factor is given in brackets):

1. Is load duration "normal" (C_D)?
C_D is a load duration factor. The tabulated maximum axial uniform loads are based on a normal duration of loading (C_D = 1.0), which includes the effects of dead loads plus live loads due to use and occupancy, and snow loads.

2. Is the service condition "dry" (C_M)?
C_M is a wet service factor. The tables are limited to dry service conditions (C_M = 1.0).

3. Is the effective length factor, K_e, equal to 1.0 and the effective panel length in the direction of buckling equal to the total panel length?

4. Are the panels concentrically loaded or subjected to a maximum eccentricity of 1/6 the panel tickness?

If the answer to any of these questions is no, the Panel Selection Tables may not be used. Instead, calculate Pr from the formula given in NDS-2012. Information on eccentrically loaded walls is provided in the CLT Handbook, U.S. Edition. Note that in certain cases the International Building Code permits a reduction in uniform live loads depending upon the size of the tributary area (refer to Article 1607.10 of the 2012 IBC).

Note: Since panel design is an iterative process, the tables may be used to select a trial section. When designing a panel with an effective length factor K_e other than 1.0, a preliminary section may be selected by using the table for K_e = 1.0 with L equal to the actual effective length $K_e L$. The preliminary section can then be checked using the design standard (note the difference between the estimated resistance and the actual resistance will not usually exceed 5%).

Earthquake safety of buildings -
Buildings are constructed with panels of a maximum width of 8 feet. The panels are joined to one another by mechanical fasteners. The connection between the boards, which make up the walls and ceilings, is done through metal plates, nails with improved adhesion and self-drilling screws. Usage of plates with limited sizes makes handling and installation easy and, owing to the integration of a great number of mechanical connections, enhances ductility as well as the building's capacity to dissipate energy generated by the earthquake.

Panel Selection Tables   Nordic X-Lam E1

P Eccentricity of 1/6
Allowable uniform load P (lbf)

L	Major strength direction				Minor strength direction	
	Layup Combinaison				Layup Combinaison	
(ft)	78-3s	105-3s	131-5s	175-5s	131-5s	175-5s
6	18 450	30 390	36 750	53 310	6 530	9 330
7	15 850	27 640	34 500	51 530	6 080	8 940
8	13 600	24 840	32 020	49 500	5 590	8 520
9	11 700	22 180	29 420	47 240	5 090	8 070
10	10 130	19 750	26 820	44 790	4 610	7 590
12		15 730	22 080	39 540		6 610
14		12 680	18 200	34 340		5 660
16			15 110	29 640		
18				25 600		
20				22 190		
22				19 340		
24				16 950		
26				14 930		
28				13 210		
30						

P Concentric end loads
Allowable uniform load P (lbf)

L	Major strength direction				Minor strength direction	
	Layup Combinaison				Layup Combinaison	
(ft)	78-3s	105-3s	131-5s	175-5s	131-5s	175-5s
6	29 730	49 150	59 300	83 490	15 030	20 470
7	24 930	44 990	56 780	82 020	14 230	20 070
8	20 720	40 130	53 370	80 090	13 100	19 520
9	17 270	35 200	49 140	77 600	11 690	18 780
10	14 510	30 640	44 420	74 440	10 190	17 790
12		23 260	35 250	66 170		15 150
14		17 960	27 810	56 520		12 270
16			22 190	47 360		
18			17 980	39 590		
20			14 790	33 270		
22				28 180		
24				24 080		
26				20 740		
28				18 010		
30						

Notes:

1. The tabulated axial loads are based on simply axially loaded walls subjected to a maximum eccentricity of 1/6 wall thickness, or on simply axially loaded walls subjected to concentric end loads only. For side loads, other eccentric end loads, or other combined axial and flexural loads, see the CLT Handbook, U.S. Edition.

2. For L ≤ 6 ft, use P for L = 6 ft. Where P values are not given, the slenderness ratio exceeds 50 (maximum permitted).

3. A complete design shall include the verifications of bearing capacity and fire safety requirements.

4. L = unsupported length