
SUBJECT: PREMIER SIPS WALL LOADS (COMBINED AXIAL & TRANSVERSE LOADING)

Building materials that are utilized to create structural components, such as walls, are subject to a combination of loads. Wall assemblies must be able to withstand axial forces, while at the same time resisting a bending load. Most building materials, including concrete, steel, lumber and other engineered wood products determine their acceptability for application in an assembly using a well-known engineering formula known as the Unity Equation.

The Unity Equation considers the ultimate load capacity for a product in both the axial and transverse directions. These ultimate loads are divided by a factor of safety which yields design values. In determining if a wall assembly meets the required combined axial and transverse loads, the wall assembly must meet the following formula:

$$\frac{f_a \text{ (Design Axial Load)}}{F_a \text{ (Allowable Axial Load)}} + \frac{f_b \text{ (Design Bending Load)}}{F_b \text{ (Allowable Bending Load)}} < 1$$

Premier SIPS have undergone extensive independent laboratory testing, resulting in data that allows design professionals to utilize this engineering formula when they design with SIPs. The next page (page 2) has a compilation of this data shown on the Premier SIPS Load Charts for Type S Spline and Type L Spline configurations. Premier SIPS Load Charts show the allowable axial load listed above and the allowable transverse load below for various thicknesses of SIPs.

Notes for load chart configurations:

- Type L Splines consist of No. 2 or better, Hem-Fir, 1-1/2 inch (38.1 mm) wide with depth equal to the core thickness, spaced to provide no less than two members for every 48 inches (1219.2 mm) of SIPs width.
- Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
- Both facings must bear on the supporting foundation or structure.
- Tabulated values for 8-foot (2.44 m) walls apply to SIPs constructed with OSB strength axis oriented either parallel or perpendicular to supports.

See Load Design Charts 1C and 1D on the following pages. All Current Load Charts are available at www.premiersips.com.

LOAD CHART #1C							
Wall Allowable Combined Loads ¹⁻⁴							
Type S Spline							
SIP Thickness	Uniform Loads	SIP Height (ft.)					
		8'	10'	12'	16'	20'	24'
4-1/2"	Axial Load (PLF)	3500	2553	2452	2117	NA	NA
	Transverse Load (PSF)	55	44	36	22	NA	NA
6-1/2"	Axial Load (PLF)	4250	4043	3373	3923	2817	2183
	Transverse Load (PSF)	67	53	44	33	24	NA
8-1/4"	Axial Load (PLF)	4917	4327	4473	4194	3497	3067
	Transverse Load (PSF)	75	60	50	37	30	22
10-1/4"	Axial Load (PLF)	4600	4414	4228	4417	3389	3248
	Transverse Load (PSF)	83	66	55	41	33	27
12-1/4"	Axial Load (PLF)	3889	3959	4028	4408	3837	3333
	Transverse Load (PSF)	89	72	60	45	36	30

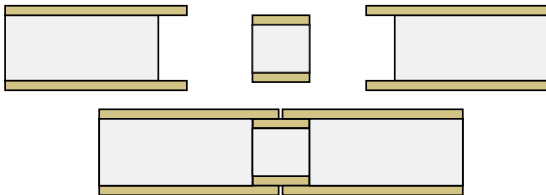
¹ Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

² Uniform combined axial (PLF) & transverse (PSF) loads.

³ Both facings must bear on the supporting foundation or structure.

⁴ Tabulated values for 8-foot (2.44 m) walls apply to SIPs constructed with OSB strength axis oriented either parallel or perpendicular to supports.

TYPE S SPLINE



NOTE:

Load Chart #1C provides maximum allowable combined distributed pounds per lineal foot (PLF) axial load and pounds per square foot (PSF) transverse load based on SIP thickness and height with Type S spline. Joists or trusses spaced 24 in. o.c. or closer are considered uniform loads. Use Type S spline for point loads.

LOAD CHART #1D							
Wall Allowable Combined Loads ¹⁻⁴							
Type L Spline							
SIP Thickness	Uniform Loads	SIP Height (ft.)					
		8'	10'	12'	16'	20'	24'
4-1/2"	Axial Load (PLF)	4723	3903	3273	2623	NA	NA
	Transverse Load (PSF)	91	61	45	23	NA	NA
6-1/2"	Axial Load (PLF)	5850	5890	4277	4310	2933	2837
	Transverse Load (PSF)	182	112	80	49	29	182
8-1/4"	Axial Load (PLF)	6807	4325	4473	4194	3496	3067
	Transverse Load (PSF)	188	133	117	80	44	24
10-1/4"	Axial Load (PLF)	5473	5709	5946	5948	4729	4250
	Transverse Load (PSF)	188	147	134	108	68	53
12-1/4"	Axial Load (PLF)	5667	5474	5281	5775	4729	4223
	Transverse Load (PSF)	188	167	153	110	83	70

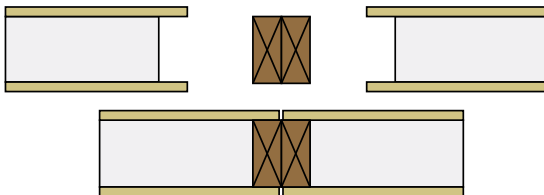
¹ Splines consist of No. 2 or better, Hem-Fir, 1-1/2 inch (38.1 mm) wide with depth equal to the core thickness, spaced to provide no less than two members for every 48 inches (1219.2 mm) of SIPs width. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

² Uniform combined axial (PSF) and transverse (PSF) loads.

³ Both facings must bear on the supporting foundation or structure.

⁴ Tabulated values for 8-foot (2.44 m) walls apply to SIPs constructed with OSB strength axis oriented either parallel or perpendicular to supports.

TYPE L SPLINE



NOTE:

Load Chart #1D provides maximum allowable uniformly distributed pounds per lineal foot (PLF) axial load based on SIP thickness and height with Type L spline. Joists or trusses spaced 24 in. o.c. or closer are considered uniform loads. Use Type L spline for point loads.