

Technical Bulletin

Wall Panel Design Charts (OSB Spline or Insulspline) - US Model Codes

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This bulletin provides design loads for the Insulspan® Structural Insulating Panel (SIP) System when used as a component in wall systems designed in accordance with the 2012, 2009 and 2006 *International Building Code*® and *International Residential Code*®. Structural testing of the Insulspan SIP System has been completed for this application using a third party testing laboratory following the requirements of ASTM E72, **Standard Test Methods of Conducting Strength Tests of Panels for Building Construction**.

The attached **Wall Panel Design Load Chart (W-1-S)** dated January 20, 2014 summarizes design loads for Insulspan SIP wall panel applications with OSB surface splines or Insulsplines. Two transverse load tables are provided based upon top plate and bottom plate support conditions as noted in the table below.

Support Condition	Application Description	Insulspan Reference Details
End Support	SIP connection @ base for one story	100.02 to 100.07A
	SIP connection @ top for one story & SIP connection @ base for two story	200.01 to 200.02A
	SIP connection @ top for two story	300.01 to 300.03 and 300.10
Modified End Support	SIP connections as per end support application with additional connection to top & bottom plates as noted	OSB skins connected to top & bottom plates using #8 by 2-1/2" long wood screws @ 12" both sides of plates.
Face Support	SIP connection @ base for one story	100.01, 100.04, 100.06A
	SIP connection @ top for timber frame construction	300.04 to 300.07A, 300.11 and 300.11A

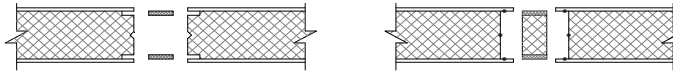
For wall panels subject to combined wind load and axial load, the following design checks are required for the required SIP thickness and span:

- Design wind load** is the component and cladding design value determined in accordance with the provisions of **ASCE 7**.
- Deflection check** is performed by comparing 70% of **design wind load** against **allowable wind load** at L/240 table value for support condition used (i.e. end support or face support condition).
- Shear and connection strength check** is performed by comparing 100% of **design wind load** against **allowable wind load** at L/180 for support condition used.
- Bending strength check** is performed using the following unity equation with 100% of **design wind load** over **allowable wind load** at L/180 for face support condition plus **design axial load** over **allowable axial load** as follows:

$$\frac{f_{c_or_Design_Axial_Load}}{F_{c_or_Allowable_Axial_Load}} + \frac{f_{b_or_Design_Wind_Load}}{F_{b_or_Allowable_Wind_Load}} \leq 1$$

For non-load bearing wall panels subject to wind load only use the load chart for applicable support condition to check 70% of **design wind load** against the L/240 **allowable wind load** and 100% of **design wind load** against L/180 **allowable wind load**.

Table W-1-S WALL PANEL DESIGN LOAD



			OSB SURFACE SPLINE OR INSULSPLINE										
Thickness		Allowable Deflection	PANEL SPAN (feet)										
SIP	EPS		8	9	10	11	12	13	14	15	16	17	18
ALLOWABLE WIND LOAD (psf) - END SUPPORT													
4 1/2"	3 5/8"	L/360	22	19	17	15	14	-	-	-	-	-	-
		L/240	25	22	20	18	17	-	-	-	-	-	-
		L/180	25	22	20	18	17	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	35	31	28	25	23	-	-	-	-	-	-
		L/240	35	31	28	25	23	-	-	-	-	-	-
		L/180	35	31	28	25	23	-	-	-	-	-	-
8 1/4"	7 3/8"	L/360	44	39	35	32	29	27	25	22	19	17	15
		L/240	44	39	35	32	29	27	25	23	22	21	19
		L/180	44	39	35	32	29	27	25	23	22	21	19
10 1/4"	9 3/8"	L/360	49	43	39	35	32	30	28	26	24	23	22
		L/240	49	43	39	35	32	30	28	26	24	23	22
		L/180	49	43	39	35	32	30	28	26	24	23	22
ALLOWABLE WIND LOAD (psf) - FACE SUPPORT OR MODIFIED END SUPPORT													
4 1/2"	3 5/8"	L/360	33	26	21	17	14	-	-	-	-	-	-
		L/240	50	39	32	26	21	-	-	-	-	-	-
		L/180	56	47	39	32	27	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	53	43	35	29	24	-	-	-	-	-	-
		L/240	68	60	52	43	36	-	-	-	-	-	-
		L/180	68	60	54	46	39	-	-	-	-	-	-
8 1/4"	7 3/8"	L/360	73	60	50	42	36	30	26	22	19	17	15
		L/240	75	67	60	55	50	44	38	33	29	25	22
		L/180	75	67	60	55	50	44	38	33	29	26	23
10 1/4"	9 3/8"	L/360	79	71	63	58	51	44	38	33	29	26	23
		L/240	79	71	63	58	53	49	43	37	33	29	26
		L/180	79	71	63	58	53	49	43	37	33	29	26
ALLOWABLE AXIAL LOAD (plf)													
4 1/2"	3 5/8"		2865	2728	2592	2455	2318						
6 1/2"	5 5/8"		2765	2755	2745	2735	2725	2714	2704	2694	2684	2674	2664
8 1/4"	7 3/8"		2678	2664	2651	2637	2623	2610	2596	2582	2568	2555	2541
10 1/4"	9 3/8"		2578	2560	2543	2525	2507	2490	2472	2454	2436	2419	2401

Notes:

Revision : January 20, 2014

1. The tabulated values are design loads based upon design requirements of International Building Code® and International Residential Code®. Transverse load values printed in **bold type** are based on panel strength rather than stiffness.
2. Insulspan SIP System must be assembled as per Insulspan Installation Guide and recommended assembly details.
3. Insulspan SIP skins are nailed to the OSB splines at longitudinal panel joints, top and bottom plates using minimum 8d box nails @ 6" o.c. or equivalent.
4. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of ASTM C 578, type I.
5. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1.