INSULSPAN
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Technical Bulletin	
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Technical Bulletin

Wall Panel Design Charts (2x Lumber Spline) - US Model Codes

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 2021, 2018, 2015, 2012, and 2009 *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 Charts** dated January 20, 2014 summarize design loads for Insulspan SIP wall panel applications with single 2x dimensional lumber splines (Table W-1-L) and double 2x dimensional lumber splines (Table W-2-DL). For each spline configuration, 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:

1. ***Design wind load*** is the component and cladding design value determined in accordance with the provisions of ***ASCE 7***.
2. **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).
3. **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.
4. **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:

$$\frac{f_c\_or\_Design\_Axial\_Load}{F_c\_or\_Allowable\_Axial\_Load} + \frac{f_b\_or\_Design\_Wind\_Load}{F_b\_or\_Allowable\_Wind\_Load} \le 1$$

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***.

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Table W-1-L WALL PANEL DESIGN LOAD

SINGLE 2 x LUMBER SPLINE @ 4'-0" On Center															
Thickness		Allowable	PANEL SPAN (feet)												
SIP	EPS	Deflection	8	9	10	11	12	13	14	15	16	17	18	19	20
ALLOWABLE WIND LOAD (psf) - END SUPPORT															
4 1/2"	3 5/8"	L/360	38	30	25	20	16	14	12	–	–	–	–	–	–
		L/240	**46**	**41**	**37**	30	25	21	17	–	–	–	–	–	–
		L/180	**46**	**41**	**37**	**33**	**31**	**28**	**23**	–	–	–	–	–	–
6 1/2"	5 5/8"	L/360	**45**	**40**	**36**	**33**	29	25	22	19	17	15	13	12	11
		L/240	**45**	**40**	**36**	**33**	**30**	**28**	**26**	**24**	**23**	**21**	**20**	18	16
		L/180	**45**	**40**	**36**	**33**	**30**	**28**	**26**	**24**	**23**	**21**	**20**	**19**	**18**
8 1/4"	7 3/8"	L/360	**44**	**39**	**35**	**32**	**29**	**27**	**25**	**24**	**22**	**21**	**20**	18	16
		L/240	**44**	**39**	**35**	**32**	**29**	**27**	**25**	**24**	**22**	**21**	**20**	**19**	**18**
		L/180	**44**	**39**	**35**	**32**	**29**	**27**	**25**	**24**	**22**	**21**	**20**	**19**	**18**
10 1/4"	9 3/8"	L/360	**43**	**38**	**35**	**31**	**29**	**27**	**25**	**23**	**22**	**20**	**19**	**18**	**17**
		L/240	**43**	**38**	**35**	**31**	**29**	**27**	**25**	**23**	**22**	**20**	**19**	**18**	**17**
		L/180	**43**	**38**	**35**	**31**	**29**	**27**	**25**	**23**	**22**	**20**	**19**	**18**	**17**
ALLOWABLE WIND LOAD (psf) - FACE SUPPORT OR MODIFIED END SUPPORT															
4 1/2"	3 5/8"	L/360	35	28	23	19	16	14	12	–	–	–	–	–	–
		L/240	52	42	35	29	24	20	17	–	–	–	–	–	–
		L/180	70	57	47	39	32	27	23	–	–	–	–	–	–
6 1/2"	5 5/8"	L/360	84	67	54	45	37	31	26	22	19	16	14	12	11
		L/240	**124**	101	82	67	55	46	39	33	28	24	21	18	16
		L/180	**124**	**110**	**99**	**87**	**74**	**62**	**52**	44	37	32	28	24	21
8 1/4"	7 3/8"	L/360	130	104	84	69	57	48	40	34	29	25	21	19	16
		L/240	**134**	**119**	**107**	**97**	86	71	60	51	43	37	32	28	25
		L/180	**134**	**119**	**107**	**97**	**89**	**78**	**67**	**58**	**51**	**45**	**41**	**36**	33
10 1/4"	9 3/8"	L/360	**147**	**131**	**118**	100	85	72	61	53	45	39	34	30	27
		L/240	**147**	**131**	**118**	**107**	**98**	**90**	**78**	**68**	**59**	**53**	**47**	**42**	**38**
		L/180	**147**	**131**	**118**	**107**	**98**	**90**	**78**	**68**	**59**	**53**	**47**	**42**	**38**
ALLOWABLE AXIAL LOAD (plf)															
4 1/2"	3 5/8"		2321	2260	2200	2139	2078	2018	1957						
6 1/2"	5 5/8"		2508	2566	2624	2681	2739	2797	2855	2912	2970	3028	3086	3143	3201
8 1/4"	7 3/8"		2672	2696	2720	2745	2769	2793	2817	2841	2865	2890	2914	2938	2962
10 1/4"	9 3/8"		2672	2696	2720	2745	2769	2793	2817	2841	2865	2890	2914	2938	2866

Revision January 20, 2014

Notes:

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. Acceptable 2x4 and 2x6 lumber for assembly of the Insulspan SIP System is SPF #2 or better; acceptable 2x8 and 2x10 lumber is Hem Fir #2 or better.
4. Insulspan SIP skins are nailed to the lumber splines at longitudinal panel joints, top and bottom plates using minimum 8d box nails @ 6" o.c. or equivalent.
5. Insulspan SIP System core material is molded expanded polystyrene (EPS) insulation complying with the requirements of ASTM C 578, type I.
6. Insulspan SIP System exterior skins are minimum 7/16" thick structural grade oriented strand board (OSB) conforming to DOC PS2, exposure 1.

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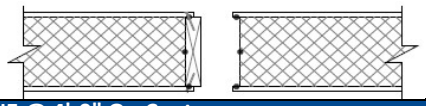
Table W-2-DL WALL PANEL DESIGN LOAD



DOUBLE 2 x LUMBER SPLINE @ 4'-0" On Center														
Thickness		Allowable	PANEL SPAN (feet)											
SIP	EPS	Deflection	8	9	10	11	12	13	14	15	16	17	18	19	20
ALLOWABLE WIND LOAD (psf) - END SUPPORT															
4 1/2"	3 5/8"	L/360	40	32	26	22	18	15	13	–	–	–	–	–	–
		L/240	**46**	**41**	**37**	**33**	27	23	20	–	–	–	–	–	–
		L/180	**46**	**41**	**37**	**33**	**31**	**28**	26	–	–	–	–	–	–
6 1/2"	5 5/8"	L/360	**47**	**42**	**38**	**34**	**31**	**29**	**27**	24	21	18	16	14	13
		L/240	**47**	**42**	**38**	**34**	**31**	**29**	**27**	**25**	**24**	**22**	**21**	**20**	**19**
		L/180	**47**	**42**	**38**	**34**	**31**	**29**	**27**	**25**	**24**	**22**	**21**	**20**	**19**
8 1/4"	7 3/8"	L/360	**48**	**43**	**38**	**35**	**32**	**30**	**27**	**26**	**24**	**23**	**21**	**20**	**19**
		L/240	**48**	**43**	**38**	**35**	**32**	**30**	**27**	**26**	**24**	**23**	**21**	**20**	**19**
		L/180	**48**	**43**	**38**	**35**	**32**	**30**	**27**	**26**	**24**	**23**	**21**	**20**	**19**
10 1/4"	9 3/8"	L/360	**49**	**44**	**39**	**36**	**33**	**30**	**28**	**26**	**25**	**23**	**22**	**21**	**20**
		L/240	**49**	**44**	**39**	**36**	**33**	**30**	**28**	**26**	**25**	**23**	**22**	**21**	**20**
		L/180	**49**	**44**	**39**	**36**	**33**	**30**	**28**	**26**	**25**	**23**	**22**	**21**	**20**
ALLOWABLE WIND LOAD (psf) - FACE SUPPORT OR MODIFIED END SUPPORT															
4 1/2"	3 5/8"	L/360	40	33	26	22	18	15	13	–	–	–	–	–	–
		L/240	59	49	39	33	27	23	20	–	–	–	–	–	–
		L/180	78	65	52	44	36	31	26	–	–	–	–	–	–
6 1/2"	5 5/8"	L/360	84	69	55	46	38	32	27	24	21	18	16	14	13
		L/240	**124**	103	82	69	57	49	41	36	31	27	24	21	19
		L/180	**124**	**111**	**99**	**87**	**74**	63	52	47	41	36	32	29	26
8 1/4"	7 3/8"	L/360	142	115	89	75	62	53	45	39	34	30	26	23	21
		L/240	**148**	**129**	**111**	**100**	**90**	78	66	57	49	44	39	35	31
		L/180	**148**	**129**	**111**	**100**	**90**	**82**	**75**	**69**	**63**	57	51	46	41
10 1/4"	9 3/8"	L/360	**185**	**160**	**136**	116	97	83	70	61	53	47	41	37	33
		L/240	**185**	**160**	**136**	**120**	**105**	**96**	**88**	**81**	**75**	**69**	**64**	56	48
		L/180	**185**	**160**	**136**	**120**	**105**	**96**	**88**	**81**	**75**	**69**	**64**	**59**	**55**
ALLOWABLE AXIAL LOAD (plf)															
4 1/2"	3 5/8"		2865	2728	2592	2455	2318	2138	1957						
6 1/2"	5 5/8"		2762	2799	2835	2872	2908	2945	2982	3018	3055	3091	3128	3164	3201
8 1/4"	7 3/8"		2672	2696	2720	2745	2769	2793	2817	2841	2865	2890	2914	2938	2962
10 1/4"	9 3/8"		2672	2696	2720	2745	2769	2793	2817	2841	2865	2890	2914	2938	2866

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