

# 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 *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 Charts** dated September 17, 2009 summarize design loads for Insulspan SIP wall panels with OSB spline joint configurations as noted.

- Table W-1-S – Wall Panel Design Load

Two transverse load tables are provided based upon top plate and bottom plate support conditions illustrated in Insulspan Construction Assembly Details as follows:

1. **End Support** is illustrated in the following Insulspan details:
  - a. One story base connection: 100.02, 100.02A, 100.03, 100.05, 100.05A, 100.06, 100.07, 100.07A.
  - b. Lower story top connection and upper story base connection for two story construction: 200.01, 200.02, 200.02A.
  - c. Top connection: 300.01, 300.01A, 300.02, 300.02A, 300.03, 300.10.
2. **Face Support** is illustrated in the following Insulspan details:
  - a. Base connection for one story: 100.01, 100.04, 100.06A.
  - b. Top connection for timber frame application: 300.04, 300.04A, 300.05, 300.05A, 300.06, 300.06A, 300.07, 300.07A, 300.11, 300.11A.
3. **Modified End Support** is as per note 1 above with additional connection of OSB exterior skins to top and bottom plates using #8 by 2 1/2" long wood screws @ 12" on center both sides of plates.

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:

$$\frac{f_c \text{ or Design Axial Load}}{F_c \text{ or Allowable Axial Load}} + \frac{f_b \text{ or Design Wind Load}}{F_b \text{ or Allowable Wind Load}} \leq 1$$

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**.

### Contact:

East: 1-800-726-3510

West: 1-866-848-8855

www.insulspan.com

**Table W-1-S WALL PANEL DESIGN LOAD**



Thickness		Allowable Deflection	OSB SURFACE SPLINE OR INSULSPLINE										
SIP	EPS		PANEL SPAN (feet)										
			8	9	10	11	12	13	14	15	16	17	18
<b>ALLOWABLE WIND LOAD (psf) - END SUPPORT</b>													
4 1/2"	3 5/8"	L/360	22	19	17	15	14	-	-	-	-	-	-
		L/240	<b>25</b>	<b>22</b>	<b>20</b>	<b>18</b>	<b>17</b>	-	-	-	-	-	-
		L/180	<b>25</b>	<b>22</b>	<b>20</b>	<b>18</b>	<b>17</b>	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	<b>35</b>	<b>31</b>	<b>28</b>	<b>25</b>	<b>23</b>	-	-	-	-	-	-
		L/240	<b>35</b>	<b>31</b>	<b>28</b>	<b>25</b>	<b>23</b>	-	-	-	-	-	-
		L/180	<b>35</b>	<b>31</b>	<b>28</b>	<b>25</b>	<b>23</b>	-	-	-	-	-	-
8 1/4"	7 3/8"	L/360	<b>44</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>29</b>	<b>27</b>	<b>25</b>	<b>22</b>	<b>19</b>	<b>17</b>	<b>15</b>
		L/240	<b>44</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>29</b>	<b>27</b>	<b>25</b>	<b>23</b>	<b>22</b>	<b>21</b>	<b>19</b>
		L/180	<b>44</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>29</b>	<b>27</b>	<b>25</b>	<b>23</b>	<b>22</b>	<b>21</b>	<b>19</b>
10 1/4"	9 3/8"	L/360	<b>49</b>	<b>43</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>30</b>	<b>28</b>	<b>26</b>	<b>24</b>	<b>23</b>	<b>22</b>
		L/240	<b>49</b>	<b>43</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>30</b>	<b>28</b>	<b>26</b>	<b>24</b>	<b>23</b>	<b>22</b>
		L/180	<b>49</b>	<b>43</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>30</b>	<b>28</b>	<b>26</b>	<b>24</b>	<b>23</b>	<b>22</b>
<b>ALLOWABLE WIND LOAD (psf) - FACE SUPPORT OR MODIFIED END SUPPORT</b>													
4 1/2"	3 5/8"	L/360	33	26	21	17	14	-	-	-	-	-	-
		L/240	50	39	32	26	21	-	-	-	-	-	-
		L/180	<b>56</b>	<b>47</b>	<b>39</b>	<b>32</b>	<b>27</b>	-	-	-	-	-	-
6 1/2"	5 5/8"	L/360	53	43	35	29	24	-	-	-	-	-	-
		L/240	<b>68</b>	<b>60</b>	52	43	36	-	-	-	-	-	-
		L/180	<b>68</b>	<b>60</b>	<b>54</b>	<b>46</b>	<b>39</b>	-	-	-	-	-	-
8 1/4"	7 3/8"	L/360	73	60	50	42	36	30	26	22	19	17	15
		L/240	<b>75</b>	<b>67</b>	<b>60</b>	<b>55</b>	<b>50</b>	<b>44</b>	<b>38</b>	<b>33</b>	<b>29</b>	<b>25</b>	<b>22</b>
		L/180	<b>75</b>	<b>67</b>	<b>60</b>	<b>55</b>	<b>50</b>	<b>44</b>	<b>38</b>	<b>33</b>	<b>29</b>	<b>26</b>	<b>23</b>
10 1/4"	9 3/8"	L/360	<b>79</b>	<b>71</b>	<b>63</b>	<b>58</b>	51	44	38	33	29	26	23
		L/240	<b>79</b>	<b>71</b>	<b>63</b>	<b>58</b>	<b>53</b>	<b>49</b>	<b>43</b>	<b>37</b>	<b>33</b>	<b>29</b>	<b>26</b>
		L/180	<b>79</b>	<b>71</b>	<b>63</b>	<b>58</b>	<b>53</b>	<b>49</b>	<b>43</b>	<b>37</b>	<b>33</b>	<b>29</b>	<b>26</b>
<b>ALLOWABLE AXIAL LOAD (plf)</b>													
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

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**Notes:**

1. The tabulated values are design loads based upon design requirements of 2006 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.