

Product Information Bulletin

Insulspan SIP System and BCBC 2006

The Insulspan® SIP (Structural Insulating Panel) System is an energy efficient building system that consists of a core of expanded polystyrene (EPS) insulation with oriented strand board (OSB) structurally laminated to the interior and exterior faces. The purpose of this bulletin is to clarify how the Insulspan SIP System wall meets the minimum thermal resistance in the British Columbia Building Code 2006 as amended by Ministerial Order No. M100, dated April 3, 2008.

“Effective Thermal Resistance” calculated as per National Energy Code of Canada 1997 is a measure of the thermal resistance of a building assembly when the effect of thermal bridges is included. As the following thermal resistance calculations demonstrate, wood studs at 406 mm (16”) on center in wood-frame construction act as thermal bridges in a wall assembly reducing the overall effective thermal resistance of an assembly.

Wall Assemblies:

Section 10.2, Energy Efficiency amended the minimum thermal resistance for buildings of residential occupancy as noted below for wall assemblies.

Table 10.2.1.1.A — Minimum Thermal Resistance of Insulation, RSI, m²•°C/W

Exterior Enclosure	Less than 3500 Degree Days	3500 Degree to 4500 Degree Days	More than 3500 Degree Days
Frame Walls	RSI-3.5 (R-19.9)	RSI-3.5 (R-19.9)	RSI-3.85 (R-21.9)

The overall thermal resistance for a 6 ½” Insulspan SIP System with wood framing at 48” (1220-mm) on center versus a wall with 2 x 6 wood framing at 16” (400 mm) on center and cavity insulation is calculated below per Model National Energy Code of Canada for House 1997.

Effective Thermal Resistance – BCBC 2006

6 ½” Insulspan SIP System			2 x 6 Stud Wall		
Component	RSI Framed Portion	RSI Insulated Portion	Component	RSI Framed Portion	RSI Insulated Portion
Outside Air Film	0.03	0.03	Outside Air Film	0.03	0.03
Metal Siding	0.11	0.11	Metal Siding	0.11	0.11
Sheathing Paper	0.01	0.01	Sheathing Paper	0.01	0.01
7/16” OSB Facing	0.12	0.12	7/16” OSB Sheathing	0.12	0.12
EPS Insulation Core	----	3.71	Cavity Insulation	----	3.50
Wood Stud @ 48”	1.13	----	Wood Stud @ 16”	1.13	----
7/16” OSB Facing	0.12	0.12	½” Gypsum Board	0.08	0.08
½” Gypsum Board	0.08	0.08	Inside Air Film	0.12	0.12
Inside Air Film	0.12	0.12			
Total	1.73	4.31	Total	1.60	3.97
% Wall Area	8%	92%	% Wall Area	19%	81%
Effective RSI - m²•°C/W (R-Value - ft²•hr•°F/BTU)	RSI-3.85 (R-21.9)			RSI-3.10 (R-17.6)	

Contact:

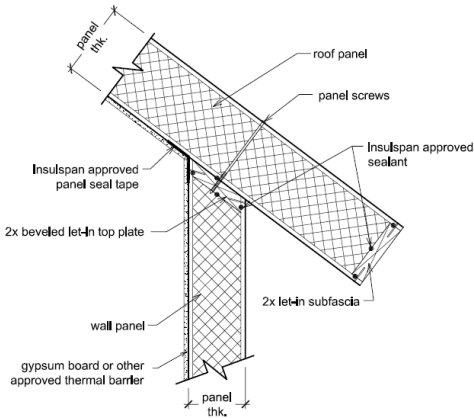
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Another key consideration in the design of energy efficiency structures is air leakage characteristics of the structure. Air leakage rates vary widely for different types of house construction. Typical energy efficient structures provide an air leakage rate of 1.5 acph (air changes per hour). Homes built with the Insulspan SIP System can provide significant reduction in air leakage with values of less than 1.0 acph achievable when constructed according to the Insulspan Installation Guide in combination with other energy-efficient building components

Insulspan Roof Assembly:



The required roof joist assembly RSI (R-Value) as provided in Table 10.2.1.1.A assumes standard truss or rafter cathedral ceiling type construction. However, note 2 below the table clarifies that the insulation values are not intended to apply to construction without a cavity. Alternatives to the requirements in Table 10.2.1.1.A are permitted with computations illustrating equivalent performance to prescribed requirements as provided below.

Table 10.2.1.1.A — Minimum Thermal Resistance of Insulation, RSI, m²•°C/W

Exterior Enclosure	Less than 3500 Degree Days	3500 Degree to 4500 Degree Days	More than 3500 Degree Days
Roof Joist Assemblies (Cathedral Ceilings/Flat Roofs)	RSI-4.9 (R-27.8)	RSI-4.9 (R-27.8)	RSI-4.9 (R-27.8)

The overall thermal resistance for a 12 ¼" Insulspan SIP System with wood framing at 48" (1.2 m) on center is calculated below per Model National Energy Code of Canada for House 1997 and provides an effective thermal resistance exceeding requirements for cathedral ceiling type construction.

12 ¼" Insulspan SIP System Effective Thermal Resistance – BCBC 2006

Component	RSI Framed Portion	RSI Insulated Portion
Outside Air Film (above roof)	0.03	0.03
Asphalt Shingle	0.08	0.08
Sheathing Paper	0.01	0.01
OSB Facing	0.12	0.12
EPS Insulation Core	----	7.51
Wood Stud	2.31	----
OSB Facing	0.12	0.12
½" Gypsum Wall Board	0.08	0.08
Inside Air Film	0.11	0.11
Total	2.87	8.06
% Wall Area	3.0%	97.0%
Effective RSI - m²•°C/W (R-Value - ft²•hr•°F/BTU)	RSI-7.58 (R-43.1)	