

Insulspan SIPs PIB 221

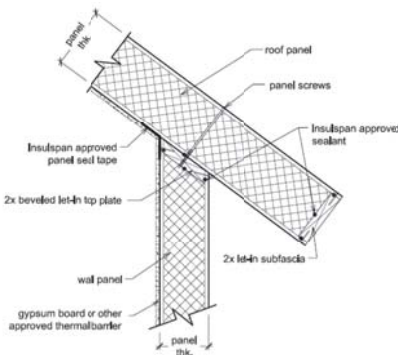
Insulspan SIP System - 2014 ABC Energy Efficiency Requirements

Product Information Bulletin

Insulspan® SIP System - 2014 ABC Energy Efficiency Requirements

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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.



This bulletin provides **effective thermal resistance (RSI_{eff}/R_{eff})** for Insulspan SIP System wall and roof assemblies calculated as per 2014 Alberta Building Code (2014 ABC), Subsection 9.36.2.

Insulspan SIP wall and roof assemblies are constructed with wood framing at 1,220 mm (48") on center versus typical wood frame assemblies which are constructed with wood framing at 406 mm (16") to 610 mm (24") on center. **Effective thermal resistance (RSI_{eff}/R_{eff})** is calculated using the formula below as per 2014 ABC, Appendix Note A-9.36.2.4.(1) which includes the effect of thermal bridging due to wood framing members.

$$RSI_{eff} (R_{eff}) = \frac{100\%}{\frac{\% \text{ Area of Framing}}{RSI_F(R_F)} + \frac{\% \text{ Area of Cavity}}{RSI_C(R_C)}} + RSI(R) \text{ Continuous Material Layers}$$

Where:

- $RSI_F (R_F)$ = Thermal resistance of framing members
- $RSI_C (R_C)$ = Thermal resistance of insulation component

Table 1 below provides minimum **RSI_{eff}/R_{eff}** requirements from 2014 ABC, Tables 9.36.2.6.A. and 9.36.2.6.B. for wall and roof assemblies

Table 1 – 2014 ABC Minimum RSI_{eff}/R_{eff} for Above-Ground Opaque Building Assemblies

2014 ABC Climate Zones	Zone 4	Zone 5	Zone 6	Zone 7a	Zone 7b	Zone 8
Heating Degree-Days (HDD) Celsius Degree-Days	< 3,000	3,000 to 3,999	4,000 to 4,999	5,000 to 5,999	6,000 to 6,999	≥ 7,000
Wall Assemblies - Where a Heat Recovery Ventilator (HRV) is not Installed						
$RSI_{eff} - m^2 \cdot ^\circ C/W$	2.78	3.08	3.08	3.08	3.85	3.85
$R_{eff} - ft^2 \cdot hr \cdot ^\circ F/BTU$	15.8	17.5	17.5	17.5	21.9	21.9
Wall Assemblies - Where a Heat Recovery Ventilator (HRV) is Installed						
$RSI_{eff} - m^2 \cdot ^\circ C/W$	2.78	2.97	2.97	2.97	3.08	3.08
$R_{eff} - ft^2 \cdot hr \cdot ^\circ F/BTU$	15.8	16.9	16.9	16.9	17.5	17.5
Cathedral Ceilings and Flat Roofs - With or Without Heat Recovery Ventilator (HRV) Installed						
$RSI_{eff} - m^2 \cdot ^\circ C/W$	4.67	4.67	4.67	5.02	5.02	5.02
$R_{eff} - ft^2 \cdot hr \cdot ^\circ F/BTU$	26.5	26.5	26.5	28.5	28.5	28.5

Insulspan SIP System Wall Assemblies:

Table 2 provides RSI_{eff}/R_{eff} calculations for 6 1/2" and 8 1/4" Insulspan SIP wall assemblies meeting 2014 ABC requirements.

Table 2 – RSI_{eff}/R_{eff} Calculation for Insulspan SIP System Wall Assemblies

Insulspan SIP Wall Assembly	6 1/2" Insulspan SIP			8 1/4" Insulspan SIP		
	RSI_F	RSI_C	Continuous Materials	RSI_F	RSI_C	Continuous Materials
Outside Air Film	----	----	0.03	----	----	0.03
Cladding	----	----	0.11	----	----	0.11
7/16" Oriented Strand Board	----	----	0.11	----	----	0.11
PlastiSpan Type 1 Insulation	----	3.71	----	----	4.87	----
Wood Stud @ 1220 mm (48") o.c.	1.19	----	----	1.57	----	----
7/16" Oriented Strand Board	----	----	0.11	----	----	0.11
Gypsum Wall Board, 13 mm (1/2")	----	----	0.08	----	----	0.08
Inside Air Film	----	----	0.12	----	----	0.12
RSI Sub-totals	1.19	3.71	0.56	1.57	4.87	0.56
% Area of Each Component	14%	86%	100%	14%	86%	100%
Effective Thermal Resistance	RSI_{eff}	RSI-3.42			RSI-4.32	
	R_{eff}	R-19.4			R-24.5	

Insulspan SIP System Roof Assemblies:

Table 3 provides sample RSI_{eff}/R_{eff} calculations for 10 1/4" and 12 1/4" Insulspan SIP roof assemblies meeting 2014 ABC requirements.

Table 3 – RSI_{eff}/R_{eff} Calculation for Insulspan SIP System Roof Assemblies

Insulspan SIP Roof Assembly	10 1/4" Insulspan SIP			12 1/4" Insulspan SIP		
	RSI_F	RSI_C	Continuous Materials	RSI_F	RSI_C	Continuous Materials
Outside Air Film	----	----	0.03	----	----	0.03
Asphalt Shingles	----	----	0.08	----	----	0.08
Roof Sheathing Membrane	----	----	0.03	----	----	0.03
7/16" Oriented Strand Board	----	----	0.11	----	----	0.11
PlastiSpan Type 1 Insulation	----	6.19	----	----	7.51	----
Wood Stud @ 1220 mm (48") o.c.	2.00	----	----	2.43	----	----
7/16" Oriented Strand Board	----	----	0.11	----	----	0.11
Gypsum Wall Board, 13 mm (1/2")	----	----	0.08	----	----	0.08
Inside Air Film	----	----	0.12	----	----	0.12
RSI Sub-totals	2.00	6.19	0.56	2.43	7.51	0.56
% Area of Each Component	9%	91%	100%	9%	91%	100%
Effective Thermal Resistance	RSI_{eff}	RSI-5.76			RSI-6.88	
	R_{eff}	R-32.7			R-39.1	