

# Product Information Bulletin

## Insulspan SIP System and the Michigan Energy Code

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 or exceeds the minimum thermal resistance requirements in the recently adopted 2003 Michigan Uniform Energy Code.

**“Overall Thermal Resistance”** calculated as per the *ASHRAE Handbook of Fundamentals* 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 thermal resistance of an assembly.

### Wall Assemblies

Section N1102.1.1 of the Michigan Uniform Energy Code requires that the thermal resistance of the cavity insulation for a wall assembly must meet the requirements of Table N1102.1 as noted below.

#### Michigan Uniform Energy Code 2003 — Minimum Thermal Resistance of Insulation

Exterior Enclosure	Zone 1	Zone 2	Zone 2
Wall assemblies	R-21	R-21	R-21

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 *ASHRAE Handbook of Fundamentals* parallel-path heat calculation method.

#### Overall Thermal Resistance (ft<sup>2</sup>•hr•°F/BTU) – Michigan Uniform Energy Code 2003

6 ½” Insulspan SIP System			2 x 6 Stud Wall		
Component	R-value Framed Portion	R-value Insulated Portion	Component	R-value Framed Portion	R-value Insulated Portion
Outside Air Film	0.17	0.17	Outside Air Film	0.17	0.17
Metal Siding	0.62	0.62	Metal Siding	0.62	0.62
Sheathing Paper	0.06	0.06	Sheathing Paper	0.06	0.06
7/16" OSB Facing	0.69	0.69	7/16" OSB Sheathing	0.69	0.69
<b>Type I EPS Insulation</b>	----	<b>21.1</b>	<b>Cavity Insulation</b>	----	<b>21.0</b>
Wood Stud @ 48"	6.44	----	Wood Stud @ 16"	6.44	----
7/16" OSB Facing	0.69	0.69	½" Gypsum Board	0.45	0.45
½" Gypsum Board	0.45	0.45	Inside Air Film	0.68	0.68
Inside Air Film	0.68	0.68			
<b>Total</b>	<b>9.80</b>	<b>24.5</b>	<b>Total</b>	<b>9.11</b>	<b>23.7</b>
% Area Each Portion	8%	92%	% Area Each Portion	19%	81%
<b>Overall R-value</b>	<b>R-21.9</b>		<b>Overall R-value</b>	<b>R-18.2</b>	

### Contact:

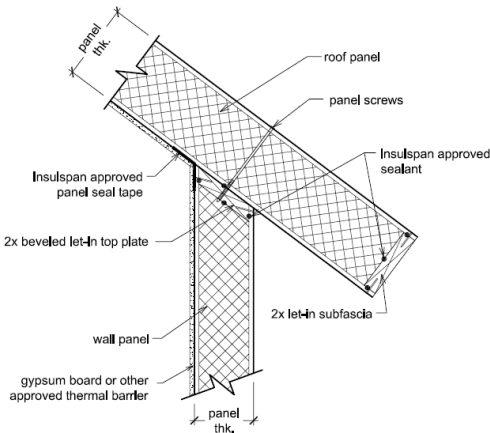
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Another key consideration in energy efficient design is air leakage characteristics of the structure. Air leakage rates vary widely for different types of house construction. Typical energy efficient structures provide an air leakage rate of 1.5 acph (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**



As per section N1102.1.2, the ceiling R-value required in Table N1102.1 of the Michigan Uniform Energy Code assumes standard truss or rafter construction, including cathedral ceilings. However, where the construction method allows the insulation R-value to be continuous over the wall top plate, as is typical for the Insulspan SIP System, R-38 insulation is permitted where R-49 is required in Table N1102.1 as noted below.

**Michigan Uniform Energy Code 2003 — Minimum Thermal Resistance of Insulation**

Exterior Enclosure	Zone 1	Zone 2	Zone 2
Truss or rafter Roof/Ceiling assemblies	R-49	R-49	R-49
<b>Insulspan SIP Roof Assembly</b>	<b>R-38</b>	<b>R-38</b>	<b>R-38</b>

The overall thermal resistance for a 10 1/4" Insulspan SIP System with wood framing at 48" (1220-mm) on center is calculated below per the **ASHRAE Handbook of Fundamentals** parallel-path heat calculation method. Note that the R-value of the ASTM C578 Type II EPS insulation core in the Insulspan SIP System meets Michigan Energy Code requirements.

**Overall Thermal Resistance – Michigan Uniform Energy Code 2003**

10 1/4" Insulspan SIP System – Roof Assembly		
Component	R-value Framed Portion	R-value Insulated Portion
Outside Air Film (above roof)	0.17	0.17
Asphalt Shingle	0.45	0.45
Sheathing Paper	0.06	0.06
OSB Facing	0.54	0.54
<b>ASTM C578 Type II EPS Insulation Core</b>	----	<b>38.0</b>
Wood Stud	11.1	----
OSB Facing	0.54	0.54
Gypsum Wall Board, 13 mm (1/2")	0.45	0.45
Inside Air Film	0.63	0.63
<b>Total</b>	<b>13.9</b>	<b>40.8</b>
% Area of Each Component - Note 2	8%	92%
<b>Overall R-value (ft<sup>2</sup>•hr•°F/BTU)</b>	<b>R-33.4</b>	