INSULSPAN®
STRUCTURAL INSULATING PANEL SYSTEM
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Product Information Bulletin

Insulspan® SIP System - 2015 Michigan Uniform Building Code

The Insulspan® SIP 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 highlights typical wall and roof assemblies built with the Insulspan SIP System that meet or exceed the energy efficiency requirements adopted in the 2015 Michigan Uniform Energy Code (MUEC).

The air leakage characteristic for energy-efficient buildings is another key design consideration that varies widely based upon the type of construction. Typical energy efficient homes can provide an air leakage rate of 1.5 acph (air changes per hour). However, homes built with the Insulspan SIP System combining other energy efficient building components can provide significant reduction in air leakage with values of less than 1.0 acph achievable.

The 2015 MUEC is based upon the 2015 International Energy Conservation Code (IECC) and provides two methods of establishing building envelope component compliance.

1. Table 1 below provides minimum thermal resistance (R-value) for the insulation component in wood frame wall and ceiling components from MUEC Table R402.1.1.

Table 1 - Minimum Insulation R-value for Wall and Roof Components

Climate Zone	Wood Frame Wall R-value	Ceiling R-value
5A	20	38
6A	20	49
7	21	49

2. 2015 MUEC provides an alternate method to demonstrate energy efficiency compliance based upon **maximum equivalent U-factors**. **U-factor** (thermal transmittance) is defined as the coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h•ft^2•°F) [W/(m^2•K)]. U-factor is the inverse of the **Overall R-value** of a building assembly calculated as per the ***ASHRAE Handbook of Fundamentals***. Table 2 below provides maximum equivalent U-factors for wood frame wall and ceiling components from MUEC Table R402.1.3.

Table 2 - Maximum Equivalent U-Factors for Wall and Roof Components

Climate Zone	Frame Wall U-factor	Ceiling U-factor
5A	0.057	0.030
6A	0.057	0.026
7	0.057	0.026

On the following page examples of Insulspan SIP wall and roof assemblies that meet 2015 MUEC requirements are provided. These are intended to be examples of typical assemblies only. Consult your Insulspan sales representative for a detailed review of appropriate wall and roof construction for your application.

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Wall Assemblies

Table 3 provides an equivalent U-factor comparison for a 6 ½" Insulspan SIP wall assembly with wood studs at 48" on center versus a 2 x 6 wood framed wall assembly with studs at 16" on center and minimum cavity insulation per Table 1 for Zone 7. Both wall assembly types meet 2015 MUEC requirements for Zone 5A, 6A and 7; however, the Insulspan SIP wall assembly provides approximately 20% higher overall thermal resistance than the 2 x 6 wood framed wall assembly.

Table 3 - Typical Wall Assemblies

Wall Assembly Components	6 ½" Insulspan SIP System		2 x 6 Wood Framed Wall	
	R-value Framed Area	R-value Opaque Area	R-value Framed Area	R-value Opaque Area
Outside Air Film	0.2	0.2	0.2	0.2
Metal Siding	0.6	0.6	0.6	0.6
Sheathing Paper	0.1	0.1	0.1	0.1
7/16" OSB Facing or sheathing	0.7	0.7	0.7	0.7
EPS Insulation Core or Cavity	**----**	***21.7***	**----**	***21.0***
Wood Stud Framing	6.4	----	6.4	----
7/16" OSB Facing	0.7	0.7	----	----
½" Gypsum Board	0.4	0.4	0.4	0.4
Inside Air Film	0.7	0.7	0.7	0.7
Total	**9.8**	**25.1**	**9.1**	**23.7**
Overall R-value (ft^2•hr•°F/BTU)	**R-22.3**		**R-18.2**	
U-Factor (BTU/ft^2•hr•°F)	**0.045**		**0.055**	
Compliance	**Zones 5A , 6A and 7**		**Zone 5A, 6A and 7**	

Roof Assemblies

The table below provides examples of Insulspan SIP System roof assemblies that meet maximum equivalent U-factor requirements per table 2 for Zones 5A, 6A and 7.

Table 4 - Typical Roof Assemblies

SIP Roof Assembly Components	10 ¼" Insulspan SIP System		12 ¼" Insulspan SIP System	
	R-value Framed Area	R-value Opaque Area	R-value Framed Area	R-value Opaque Area
Outside Air Film (above roof)	0.2	0.2	0.2	0.2
Asphalt Shingle	0.5	0.5	0.5	0.5
Sheathing Paper	0.1	0.1	0.1	0.1
OSB Facing	0.6	0.6	0.5	0.5
EPS Insulation Core	----	36.2	----	43.9
Wood Stud Framing	11.1	----	13.2	----
OSB Facing	0.6	0.6	0.5	0.5
Gypsum Wall Board, 1/2"	0.4	0.4	0.4	0.4
Inside Air Film	0.6	0.6	0.6	0.6
Total	**14.1**	**39.2**	**16.0**	**46.8**
Overall R-value (ft^2•hr•°F/BTU)	**R-34.3**		**43.8**	
U-Factor (BTU/ft^2•hr•°F)	**0.029**		**0.023**	
Compliance	**Zones 5A**		**Zone 6A and 7**	