

# Product Information Bulletin

BULLETIN NO.	<b>210</b>
ISSUED:	<b>October 7, 2007</b>
REPLACES:	<b>New</b>

## Insulspan<sup>®</sup> SIP System

### 2006 OBC Thermal Design Requirements for Residential Buildings

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The purpose of this bulletin is to clarify Insulspan<sup>®</sup> SIP System compliance with 2006 Ontario Building Code, Subsection 12.3.3. – *Thermal Design for Buildings of Residential Occupancy Within the Scope of Part 9*. The table below provides requirements for minimum thermal resistance of the insulated portion of an above grade wall assembly as per 2006 OBC, Table 12.3.3.3.

**2006 OBC Minimum Thermal Resistance of Building Assemblies**

Building Element Exposed to the Exterior or to Unheated Space	Zone 1 Less than 5000 degree-days		Zone 2 5000 or more degree-days	
	RSI	R-Value	RSI	R-Value
Wall other than foundation wall	3.80	21.6	4.67	26.5

The tables in this bulletin provide the effective thermal resistance for assemblies built with the Insulspan SIP System versus wood-frame walls with minimum thermal resistance as per 2006 OBC, Table 12.3.3.3. "Effective thermal resistance" calculated using the formula below from the Model National Energy Code for Houses (MNECH) provides the overall thermal resistance of a building assembly including the effect of thermal bridges, such as wood studs, that reduce the thermal resistance of the assembly..

$$\text{Effective Thermal Resistance (RSI)} = \frac{100\%}{\frac{\% \text{ Area with Framing}}{\text{RSI Framed Portion}} + \frac{\% \text{ Area Without Framing}}{\text{RSI Insulated Portion}}}$$

**Effective Thermal Resistance – 2006 OBC Zone 1 Above-Grade Wall Assembly**

6 1/2" Insulspan SIP System			2 x 6 Stud Wall		
Component	RSI		Component	RSI	
	Framed Portion	Insulated Portion		Framed Portion	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" Structural OSB	0.12	0.12	OSB Sheathing	0.10	0.10
5 5/8" Type 1 EPS Insulation	----	3.71	Cavity Insulation	----	3.52
2 x 6 Wood Stud @ 48"	1.13	----	2 x 6 Wood Stud @ 16"	1.13	----
7/16" Structural OSB	0.12	0.12	Gypsum board	0.08	0.08
Gypsum Wall	0.08	0.08	Inside Air Film	0.12	0.12
Inside Air Film	0.12	0.12			
<b>RSI-Sub-Totals</b>	<b>1.73</b>	<b>4.31</b>	<b>RSI-Sub-Totals</b>	<b>1.59</b>	<b>3.97</b>
<b>% Area of Wall</b>	<b>8%</b>	<b>92%</b>	<b>% Area of Wall</b>	<b>19%</b>	<b>81%</b>
<b>Effective Thermal Resistance</b>			<b>Effective Thermal Resistance</b>		
<b>RSI-3.85 m<sup>2</sup>·°C/W (R-21.85 ft<sup>2</sup>·hr·°F/BTU)</b>			<b>RSI-3.09 m<sup>2</sup>·°C/W (R-17.4 ft<sup>2</sup>·hr·°F/BTU)</b>		

**2006 OBC Zone 1 Compliance:**

The thermal resistance of an Insulspan SIP System wall exceeds the 2006 OBC, Table 12.3.3.3. minimum requirements for Zone 1. In addition, the effective thermal resistance of an Insulspan SIP wall assembly is greater than a wood-frame wall minimum thermal resistance per Table 12.3.3.3.

**2006 OBC Zone 2 Alternate Construction:**

The Insulspan SIP System is available in several different wall thicknesses. This versatility provides several alternates to meet or exceed the minimum thermal resistance in 2006 OBC, Table 12.3.3.3. Two alternates are provided in the following tables to demonstrate compliance.

**Alternate 1 - 8-1/4" Insulspan SIP System Wall:**

The table below compares an 8-1/4" Insulspan SIP wall assembly with a 7 3/8" thick core of type 1 EPS insulation to a wood-frame wall using a combination of cavity insulation plus an exterior insulating sheathing to meet minimum thermal resistance for the insulated portion of an above grade wall assembly as per 2006 OBC, Table 12.3.3.3.

**ALTERNATE 1: Effective Thermal Resistance – 2006 OBC Zone 2 Above-Grade Wall Assembly**

8 1/4" Insulspan SIP System			2 x 6 Stud Wall		
Component	RSI		Component	RSI	
	Framed Portion	Insulated Portion		Framed Portion	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
OSB Facing	0.12	0.12	Insulating Sheathing	0.82	0.82
7 3/8" Type 1 EPS Insulation	----	4.87	Cavity Insulation	----	3.52
2 x 8 Wood Stud @ 48"	1.51	----	2 x 6 Wood Stud 16"	1.13	----
OSB Facing	0.12	0.12	Gypsum Board	0.08	0.08
Gypsum Board	0.08	0.08	Inside Air Film	0.12	0.12
Inside Air Film	0.12	0.12			
<b>RSI-Sub-Totals</b>	<b>2.11</b>	<b>5.46</b>	<b>RSI-Sub-Totals</b>	<b>2.30</b>	<b>4.69</b>
<b>% Area of Wall</b>	<b>8%</b>	<b>92%</b>	<b>% Area of Wall</b>	<b>19%</b>	<b>81%</b>
<b>Effective Thermal Resistance</b>			<b>Effective Thermal Resistance</b>		
<b>RSI-4.84 m<sup>2</sup>·°C/W (R-27.52 ft<sup>2</sup>·hr·°F/BTU)</b>			<b>RSI-3.92 m<sup>2</sup>·°C/W (R-22.26 ft<sup>2</sup>·hr·°F/BTU)</b>		

**2006 OBC Zone 2 Compliance:**

The thermal resistance of the 8-1/4" Insulspan SIP System wall exceeds the 2006 OBC, Table 12.3.3.3. minimum requirements for Zone 2. In addition, the effective thermal resistance of an Insulspan SIP wall assembly is greater than a wood-frame wall minimum thermal resistance per Table 12.3.3.3.

**Alternate 2 – 6-1/2" Insulspan SIP System Wall:**

Article 12.3.3.6. of the 2006 OBC permits the thermal resistance of the insulated portion of a building assembly to be reduced by not more than 20 per cent from that required in Table 12.3.3.3. This reduction in thermal resistance is permitted where it can be shown that the total calculated heat loss from the building enclosure does not exceed the heat loss that would result if the enclosure were constructed in conformance with the minimum thermal resistance requirements in Table 12.3.3.3.

Alternate 2 compares a 6 1/2" Insulspan SIP with a 5 5/8" thick core of type 2 EPS insulation to a wood-frame wall using a combination of cavity insulation plus an exterior insulating sheathing to meet minimum

thermal resistance for the insulated portion of an above grade wall assembly as per 2006 OBC, Table 12.3.3.3.

**ALTERNATE 2: Effective Thermal Resistance – 2006 OBC Zone 2 Above-Grade Wall Assembly**

Alternate 2: 6 1/2" Insulspan SIP System			2 x 6 Stud Wall		
Component	RSI		Component	RSI	
	Framed Portion	Insulated Portion		Framed Portion	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
OSB Facing	0.12	0.12	Insulating Sheathing	0.82	0.82
5 5/8" Type 2 EPS Insulation	----	4.00	Cavity Insulation	----	3.52
2 x 6 Wood Stud @ 48"	1.51	----	2 x 6 Wood Stud 16"	1.13	----
OSB Facing	0.12	0.12	Gypsum Board	0.08	0.08
Gypsum Board	0.08	0.08	Inside Air Film	0.12	0.12
Inside Air Film	0.12	0.12			
<b>RSI-Sub-Totals</b>	<b>2.11</b>	<b>4.59</b>	<b>RSI-Sub-Totals</b>	<b>2.30</b>	<b>4.69</b>
<b>% Area of Wall</b>	<b>8%</b>	<b>92%</b>	<b>% Area of Wall</b>	<b>19%</b>	<b>81%</b>
<b>Effective Thermal Resistance</b>			<b>Effective Thermal Resistance</b>		
<b>RSI-4.20 m<sup>2</sup>·°C/W (R-23.83 ft<sup>2</sup>·hr·°F/BTU)</b>			<b>RSI-3.92 m<sup>2</sup>·°C/W (R-22.26 ft<sup>2</sup>·hr·°F/BTU)</b>		

**2006 OBC Zone 2 Compliance:**

The thermal resistance for the insulated portion of the Alternate 2 Insulspan SIP System wall using a type 2 EPS insulation core is approximately 2% below the 2006 OBC, Table 12.3.3.3. minimum requirements for Zone 2. The effective thermal resistance of the Insulspan SIP System wall assembly is greater than that of a wood-frame wall. In addition, the air tightness of the Insulspan SIP System significantly decreases air leakage and associated heat loss versus typical of wood-frame construction.

Based upon the higher effective thermal resistance and reduced heat loss provided by the Insulspan SIP System wall assembly in comparison to a wood-frame wall assembly complying with Table 12.3.3.3., the Insulspan SIP System as described would comply with the requirements of 2006 OBC, Article 12.3.3.6.