

## Product Information Bulletin

### 2012 BCBC - PlastiSpan® HD Insulation for Exterior Basement Walls

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**PlastiSpan® HD** insulation is a rigid closed cell, expanded polystyrene (EPS) insulation. Continuous **PlastiSpan HD** insulation used on the exterior of a basement wall provides a fully insulated warm wall and reduces the likelihood of condensation forming on the interior of the concrete wall.

**Table 1 – PlastiSpan HD Insulation – CAN/ULC-S701, Type 2 Material Properties**

Material Property	ASTM Test Method	Units	Values <sup>1</sup>
<b>Thermal Resistance</b> <i>Minimum RSI per 25 mm (R per inch)</i>	C518	m <sup>2</sup> •°C/W (ft <sup>2</sup> •h•°F/BTU)	0.70 (4.04)
<b>Compressive Resistance</b> <i>Minimum @ 10% Deformation</i>	D1621	kPa (psi)	110 (16)
<b>Flexural Strength</b> <i>Minimum</i>	C203	kPa (psi)	240 (35)
<b>Water Vapour Permeance<sup>2</sup></b> <i>Maximum</i>	E96	ng/(Pa•s•m <sup>2</sup> ) (Perms)	200 (3.5)
<b>Water Absorption<sup>3</sup></b> <i>Maximum</i>	D2842	% By volume	4.0
<b>Dimensional Stability</b> <i>Maximum, 7 Days @ 70 ± 2°C (158 ± 4°F)</i>	D2126	% Linear Change	1.5
<b>Limiting Oxygen Index</b> <i>Minimum</i>	D2863	%	24

#### 2012 BCBC – Energy Efficiency Requirements

2012 British Columbia Building Code (2012 BCBC), Section 9.36 provides energy efficiency requirements for buildings 3 storeys or less in building height, having a building area not exceeding 600 m<sup>2</sup> and used for major occupancies classified as residential occupancies. **Effective thermal resistance (RSI<sub>eff</sub>/R<sub>eff</sub>)** of building assemblies is calculated using the following formula which includes the thermal bridging effect due to repetitive structural members such as wood framing members in walls.

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

- PlastiSpan HD** insulation properties are third party certified to CAN/ULC-S701, **Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering**, under a certification program administered by Intertek and are listed by the Canadian Construction Materials Centre (CCMC) under evaluation listing number 12425-L.
- WVP values quoted are maximum values for 25-mm thick samples with natural skins intact. Lower values will result for thicker materials.
- The water absorption laboratory test method involves complete submersion under a head of water for 96 hours. The water absorption value above is applicable to specific end-use design requirements only to the extent that the end-use conditions are similar to test method requirements.

Table 2 provides  $RSI_{eff}$  ( $R_{eff}$ ) for basement walls per 2012 BCBC, Tables 9.36.2.8.A and 9.36.2.8.B.

**Table 2 - Minimum  $RSI_{eff}$  ( $R_{eff}$ ) – Basement Walls Below or In Contact with Ground**

NBC 2010 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
<b>Table 9.36.2.8.A. – Buildings Without a Heat-Recovery Ventilator</b>						
$RSI_{eff}$ - $m^2 \cdot ^\circ C/W$	1.99	2.98	2.98	3.46	3.46	3.97
$R_{eff}$ - $ft^2 \cdot hr \cdot ^\circ F/ BTU$	11.3	16.9	16.9	19.6	19.6	22.5
<b>Table 9.36.2.8.B. – Buildings With a Heat-Recovery Ventilator</b>						
$RSI_{eff}$ - $m^2 \cdot ^\circ C/W$	1.99	2.98	2.98	2.98	2.98	2.98
$R_{eff}$ - $ft^2 \cdot hr \cdot ^\circ F/ BTU$	11.3	16.9	16.9	16.9	16.9	16.9

Table 3 provides annual heating degree days for some building locations in Climate Zones 4 to 7A as per 2012 BCBC, Division B, Appendix C.

**Table 3 - Annual HDD (Celsius Degree Days) for Building Locations**

Climate Zone 4		Climate Zone 5		Climate Zone 6		Climate Zone 7A	
Locations	HDD	Locations	HDD	Location	HDD	Locations	HDD
Duncan	2980	Hope	3000	Cranbrook	4400	100 Mile House	5030
Victoria	2650	Nanaimo	3000	Golden	4750	Smithers	5040
West Vancouver	2950	Burnaby	3100	Terrace	4150	Dawson Creek	5900
Abbotsford	2860	Kamloops	3450	Whistler	4180	Mackenzie	5550
Chilliwack	2780	Kelowna	3400	Prince George	4720	Glacier	5800

Table 4 provides examples of continuous exterior *PlastiSpan HD* insulation for basement wall assemblies to meet minimum  $RSI_{eff}$  ( $R_{eff}$ ) per 2012 BCBC, Tables 9.36.2.8.A. and 9.36.2.8.B.

**Table 4 – PlastiSpan HD Insulation - Exterior Basement Insulation System Examples**

<b>Meets Tables 9.36.2.8.A. and 9.36.2.8.B. for Climate Zone 4</b>			
System Description	$RSI_f$	$RSI_c$	Continuous Materials
64 mm (2.5") <i>PlastiSpan HD</i> Insulation	----	----	1.78
203 mm (8") Basement Wall	----	----	0.08
Wood Strapping @ 610 mm (24")	0.54	----	----
13 mm (1/2") Gypsum Wall Board	----	----	0.08
Inside Air Film	----	----	0.12
<b>Total</b>	<b>0.54</b>	<b>NA</b>	<b>2.06</b>
<b>% Area of Each Component</b>	<b>13%</b>	<b>NA</b>	<b>100%</b>
<b>Total <math>RSI_{eff}</math> (<math>R_{eff}</math>)</b>		<b><math>RSI</math>-2.13 (R12.1)</b>	
<b>Meets Table 9.36.2.8.A. for Climate Zones 5 to 6 &amp; Table 9.36.2.8.B. for Climate Zones 5 to 8</b>			
System Description	$RSI_f$	$RSI_c$	Continuous Materials
95 mm (3.75") <i>PlastiSpan HD</i> Insulation	----	----	2.67
203 mm (8") Basement Wall	----	----	0.08
Wood Strapping @ 610 mm (24")	0.54	----	----
13 mm (1/2") Gypsum Wall Board	----	----	0.08
Inside Air Film	----	----	0.12
<b>Total</b>	<b>0.54</b>	<b>NA</b>	<b>2.95</b>
<b>% Area of Each Component</b>	<b>13%</b>	<b>NA</b>	<b>100%</b>
<b>Total <math>RSI_{eff}</math> (<math>R_{eff}</math>)</b>		<b><math>RSI</math>-3.02 (R17.1)</b>	