

## Product Information Bulletin

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

Page 1 of 2

**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><br><i>Minimum RSI per 25 mm (R per inch)</i>        | C518             | m <sup>2</sup> •°C/W<br>(ft <sup>2</sup> •h•°F/BTU) | 0.70<br>(4.04)      |
| <b>Compressive Resistance</b><br><i>Minimum @ 10% Deformation</i>             | D1621            | kPa<br>(psi)  | 110<br>(16)         |
| <b>Flexural Strength</b><br><i>Minimum</i>                                    | C203             | kPa<br>(psi)  | 240<br>(35)         |
| <b>Water Vapour Permeance<sup>2</sup></b><br><i>Maximum</i>                   | E96              | ng/(Pa•s•m <sup>2</sup> )<br>(Perms)                | 200<br>(3.5)        |
| <b>Water Absorption<sup>3</sup></b><br><i>Maximum</i>                         | D2842            | % By volume   | 4.0                 |
| <b>Dimensional Stability</b><br><i>Maximum, 7 Days @ 70 ± 2°C (158 ± 4°F)</i> | D2126            | % Linear Change                                     | 1.5                 |
| <b>Limiting Oxygen Index</b><br><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)<br>Celsius Degree-Days                        | < 3,000 | 3,000 to<br>3,999 | 4,000 to<br>4,999 | 5,000 to<br>5,999 | 6,000 to<br>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>RSI-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>RSI-3.02 (R17.1)</b> |                      |