

## Product Information Bulletin

### PlastiSpan® Insulation and XPS Insulation CAN/ULC-S701.1:2017 Types and Material Properties

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The National Standard of Canada for expanded polystyrene (EPS) insulation and extruded polystyrene (XPS) insulation referenced in the National Building Code of Canada (NBC) 2010 is CAN/ULC-S701-11, **Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering**. CAN/ULC-S701.1:2017, **Standard for Thermal Insulation, Polystyrene, Boards**, is the most recent published version of the Standard now referenced in the NBC 2015.

Since both EPS and XPS insulation products are available for some of the product types identified in S701 and S701.1, the attached tables provide a cross-reference to identify available **PlastiSpan**® insulation products for comparison.

The notes below provide relevant information for reference when reviewing the material properties values in the following tables:

1. The thermal resistance values {RSI (R-value)} in the attached tables are measured at a mean temperature of 24 °C (75 °F).
2. RSI (R-value) provided in the table for XPS insulation types is the design “long term thermal resistance” (LTTR) for a 50 mm (2-inch) thickness provided in Table 1 of CAN/ULC-S701.1:2017 predicted using the accelerated aging laboratory test method CAN/ULC-S770. LTTR of a foam plastic insulation is intended to be equivalent to thermal resistance value measured after 5-year storage in a laboratory condition – i.e. LTTR equivalent to the RSI (R-value) after 5 years in service.
3. The LTTR test method was developed for foam plastic insulation like XPS insulation manufactured with blowing agents intended to be retained for greater than 180 days to predict RSI (R-value) after the relatively short time of 5 years given the typical service life of a building. RSI (R-value) for XPS insulation will continue to decrease with time as the blowing agent in the cellular structure escapes. CAN/ULC-S701-11 and CAN/ULC-S701.1:2017 specifically require design value must be stated based upon LTTR testing in accordance with CAN/ULC-S770.
4. PlastiSpan insulation RSI (R-value) is not affected by LTTR because it is not manufactured with a blowing agent that is retained within the cellular structure. Therefore, **PlastiSpan** insulation retains a constant thermal resistance throughout the life of the product.
5. Water absorption % by volume for EPS and XPS insulation types in the attached tables are determined using a laboratory test method that involves submersion under a 50 mm (2”) head of water. The water absorption values are applicable to specific end-use design requirements only to the extent that the end-use conditions would require submersion under a head of water.
6. Water vapour permeance values in the tables are maximum values for 25-mm (1-inch) thick insulation with natural skins intact. Lower values will result for thicker materials and for laminated product.
7. While an insulation material with a lower vapour permeance characteristic may resist moisture diffusion into it and provide lower water absorption values based upon laboratory test methods, it will also dry more slowly in the event moisture gets into the cellular structure as a result of long term in-service applications. For example, see the following Plasti-Fab Product Information Bulletins (PIBs) available at <http://www.plastifab.com/technical-library/pib-plastifab.html> for additional information on this subject:
  - a. PIB 268 – EPS Insulation R-value Retention Outperforms XPS Insulation after 15 Year Below-Grade Service.
  - b. PIB 297 – Drying Potential of EPS & XPS Insulation Exposed to Environmental Cycling.
  - c. PIB 303 – XPS Insulation In-Situ Water Absorption.

PlastiSpan Insulation & XPS Insulation CAN/ULC-S701.1 Types Compressive Resistance 210 kPa (30 psi) or Less				
CAN/ULC-S701.1 Type No.	1	2	3	4
<b>Insulation Type</b>	PlastiSpan	PlastiSpan HD	PlastiSpan 25	PlastiSpan 30
<b>Compressive Resistance</b> Minimum, kPa (psi)	70 (10)	110 (16)	170 (25)	210 (30)
<b>Thermal Resistance</b> Minimum RSI per 25 mm (R-value per inch), m <sup>2</sup> ·°C/W (ft <sup>2</sup> ·hr <sup>2</sup> /BTU)	0.65 (3.75)	0.70 (4.04)	0.74 (4.27)	0.74 (4.27)
<b>Long Term Thermal Resistance</b> Minimum RSI at 50 mm (R-value at 2-inch), m <sup>2</sup> ·°C/W (ft <sup>2</sup> ·hr <sup>2</sup> /BTU)	LTTR Not Applicable	LTTR Not Applicable	LTTR Not Applicable	LTTR Not Applicable
<b>RSI (R-value) Warranty</b> Minimum % of Original	See Note 4	See Note 4	See Note 4	See Note 4
<b>Water Vapour Permeance</b> Maximum, ng/Pa·s·m <sup>2</sup> (Perm)	300 (5.0)	200 (3.5)	130 (2.3)	130 (2.3)
<b>Dimensional Stability</b> Maximum % linear change	1.5	1.5	1.5	1.5
<b>Flexural Strength</b> minimum, kPa (psi)	170 (25)	240 (35)	300 (44)	350 (50)
<b>Water Absorption</b> Maximum % by volume	4.0	3.0	2.0	2.0
<b>Standard Dimensions, mm (in.)</b>				
<b>Length</b>	2440 (96)	2440 (96)	2440 (96)	2440 (96)
<b>Width</b>	1220 (48)	1220 (48)	1220 (48)	1220 (48)
<b>Available Thickness – Minimum and Maximum, mm (in.)</b>				
<b>Minimum</b>	12.7 mm (½)	12.7 (½)	12.7 (½)	12.7 (½)
<b>Maximum</b>	1220 (48)	1220 (48)	1220 (48)	1220 (48)
		25.4 (1)	25.4 (1)	25.4 (1)
		101.6 (4)	101.6 (4)	101.6 (4)
				210 (30)
				LTTR Design Thermal Resistance
				1.66 (9.6)
				See Note 3
				90 (1.5)
				350 (50)
				0.7

<b>PlastiSpan Insulation &amp; XPS Insulation CAN/ULC-S701.1 Types Compressive Resistance Greater Than 210 kPa (30 psi)</b>				
CAN/ULC-S701.1 Type No.	3	4	3	4
<b>Insulation Type</b>	PlastiSpan 40	XPS	PlastiSpan 60	XPS
<b>Compressive resistance</b> Minimum, kPa (psi)	276 (40)	276 (40)	414 (60)	414 (60)
<b>Thermal resistance</b> Minimum per 25 mm (inch), m <sup>2</sup> ·°C/W (ft <sup>2</sup> ·hr·°F/BTU)	0.76 (4.3)	LTRR Design Thermal Resistance	0.76 (4.3)	LTRR Design Thermal Resistance
<b>Long Term Thermal Resistance</b> Minimum per 50 mm (2-inch), m <sup>2</sup> ·°C/W (ft <sup>2</sup> ·hr·°F/BTU)	LTRR Not Applicable	1.66 (9.6)	LTRR Not Applicable	1.66 (9.6)
<b>RSI (R-value) warranty</b> Minimum % of Original	See Note 4	See Note 3	See Note 4	See Note 3
<b>Water vapour permeance</b> Maximum, ng/Pa·s·m <sup>2</sup> (Perm)	130 (2.3)	60 (1.1)	130 (2.3)	60 (1.1)
<b>Dimensional stability</b> Maximum % linear change	1.5	1.5	1.5	1.5
<b>Flexural strength</b> minimum, kPa (psi)	414 (60)	414 (60)	517 (75)	517 (75)
<b>Water absorption</b> Maximum % by volume	2.0	0.7	2.0	0.7
<b>Standard Dimensions, mm (in.)</b>				
<b>Length</b>	2440 (96)	2440 (96)	2440 (96)	2440 (96)
<b>Width</b>	610 (24)	610 (24)	610 (24)	610 (24)
<b>Available Thickness – Minimum and Maximum, mm (in.)</b>				
<b>Minimum</b>	12.7 (½)	25.4 (1)	12.7 (½)	25.4 (1)
<b>Maximum</b>	1220 (48)	76.2 (3)	1220 (48)	76.2 (3)