

Product Information Bulletin

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

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The current National Standard of Canada for expanded polystyrene (EPS) insulation and extruded polystyrene (XPS) insulation referenced in the National Building Code (NBC) of Canada 2015 is CAN/ULC-S701.1:2017 (formerly CAN/ULC-S701), **Standard for Thermal Insulation, Polystyrene Boards**. Since both EPS and XPS insulation products are available for some of the product types identified in 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. The design RSI (R-value) provided in the table for XPS insulation types is the LTTR (Long-Term Thermal Resistance) 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-S770-15.
3. It is important to note that CAN/ULC-S770 has been updated to include improvements in precision and bias of the test method since it was originally published in 2000 with the 2015 version being the fourth edition. LTTR test reports demonstrating compliance with CAN/ULC-S701.1:2017 would reference testing as per CAN/ULC-S770-15.
4. 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 is equivalent to the RSI (R-value) after 5 years in service.
5. 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-S701.1:2017 specifically requires **design value** must be stated based upon LTTR testing in accordance with CAN/ULC-S770-15.
6. **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.
7. 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.
8. 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.
9. 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	2	2	3	3	3	4
Insulation Type	<i>PlastiSpan</i>	<i>PlastiSpan HD</i>	XPS	<i>PlastiSpan 20</i>	XPS	<i>PlastiSpan 25</i>	<i>PlastiSpan 30</i>	XPS
Compressive Resistance <i>Minimum, kPa (psi)</i>	70 (10)	110 (16)	110 (16)	140 (20)	140 (20)	170 (25)	210 (30)	210 (30)
Thermal Resistance <i>Minimum, m²·°C/W per 25 mm (ft²·hr·°F/BTU per inch), RSI (R-value)</i>	0.65 (3.75)	0.70 (4.04)	LTRR Design Thermal Resistance	0.70 (4.04)	LTRR Design Thermal Resistance	0.74 (4.27)	0.74 (4.27)	LTRR Design Thermal Resistance
Long Term Thermal Resistance <i>Minimum, m²·°C/W at 50 mm (ft²·hr·°F/BTU at 2-inch), RSI (R-value)</i>	LTRR Not Applicable	LTRR Not Applicable	1.62 (9.4)	LTRR Not Applicable	1.62 (9.4)	LTRR Not Applicable	LTRR Not Applicable	1.66 (9.6)
RSI (R-value) Warranty <i>Minimum, % of Original</i>	See Note 4	See Note 4	See Note 3	See Note 4	See Note 3	See Note 4	See Note 4	See Note 3
Water Vapour Permeance <i>Maximum, ng/Pa·s·m² (Perm)</i>	300 (5.0)	200 (3.5)	90 (1.5)	200 (3.5)	90 (1.5)	130 (2.3)	130 (2.3)	90 (1.5)
Dimensional Stability <i>Maximum % linear change</i>	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Flexural Strength <i>minimum, kPa (psi)</i>	170 (25)	240 (35)	240 (35)	280 (40)	300 (44)	300 (44)	350 (50)	350 (50)
Water Absorption <i>Maximum % by volume</i>	6.0	4.0	0.7	2.0	0.7	2.0	2.0	0.7
Standard Dimensions, mm (in.)								
Length	2440 (96)	2440 (96)	2440 (96)	2440 (96)	2440 (96)	2440 (96)	2440 (96)	2440 (96)
Width	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)
Available Thickness – Minimum and Maximum, mm (in.)								
Minimum	12.7 mm (½)	12.7 (½)	25.4 (1)	12.7 (½)	25.4 (1)	12.7 (½)	12.7 (½)	25.4 (1)
Maximum	1220 (48)	1220 (48)	101.6 (4)	1220 (48)	101.6 (4)	1220 (48)	1220 (48)	101.6 (4)

PlastiSpan Insulation & XPS Insulation CAN/ULC-S701.1Types Compressive Resistance Greater Than 210 kPa (30 psi)				
CAN/ULC-S701.1 Type No.	3	4	3	4
Insulation Type	<i>PlastiSpan 40</i>	XPS	<i>PlastiSpan 60</i>	XPS
Compressive resistance <i>Minimum, kPa (psi)</i>	276 (40)	276 (40)	414 (60)	414 (60)
Thermal Resistance <i>Minimum, m²·°C/W per 25 mm (ft²·hr·°F/BTU per inch), RSI (R-value)</i>	0.76 (4.3)	LTRR Design Thermal Resistance	0.76 (4.3)	LTRR Design Thermal Resistance
Long Term Thermal Resistance <i>Minimum, m²·°C/W at 50 mm (ft²·hr·°F/BTU at 2-inch), RSI (R-value)</i>	LTRR Not Applicable	1.66 (9.6)	LTRR Not Applicable	1.66 (9.6)
RSI (R-value) Warranty <i>Minimum, % of Original</i>	See Note 4	See Note 3	See Note 4	See Note 3
Water vapour permeance <i>Maximum, ng/Pa·s·m² (Perm)</i>	130 (2.3)	60 (1.1)	130 (2.3)	60 (1.1)
Dimensional stability <i>Maximum % linear change</i>	1.5	1.5	1.5	1.5
Flexural strength <i>minimum, kPa (psi)</i>	414 (60)	414 (60)	517 (75)	517 (75)
Water absorption <i>Maximum % by volume</i>	2.0	0.7	2.0	0.7
Standard Dimensions, mm (in.)				
Length	2440 (96)	2440 (96)	2440 (96)	2440 (96)
Width	610 (24)	610 (24)	610 (24)	610 (24)
Available Thickness – Minimum and Maximum, mm (in.)				
Minimum	12.7 (½)	25.4 (1)	12.7 (½)	25.4 (1)
Maximum	1220 (48)	76.2 (3)	1220 (48)	76.2 (3)