Plasti-Fab EPS PRODUCT SOLUTIONS
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Product Information Bulletin

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

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***. However, the most recent published version of the standard is CAN/ULC-S701.1:2017, ***Standard for Thermal Insulation, Polystyrene, Boards***, is also now available. Since both EPS and XPS insulation products are available with similar material properties for the product types identified in S701/S701.1, the attached table provides a cross-reference to identify available 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 ºC (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 a relatively short time of 5 years in service. XPS insulation RSI (R-value) will continue to decrease with time as the blowing agent in the cellular structure escapes. Any thermal resistance warranty for XPS insulation manufactured to CAN/ULC-S701-11 or CAN/ULC-S701.1:2017 must specifically address LTTR based upon testing in accordance with CAN/ULC-S770 since this is the design value provided for XPS insulation in both versions of the standard.
4. EPS insulation R-value is not dependent upon a blowing agent retained within the cellular structure so LTTR testing and reporting is not required. Plasti-Fab offers a 100% R-value warranty.
5. Water absorption % by volume for EPS and XPS insulation types in the 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.

CAN/ULC-S701.1 PlastiSpan and XPS Insulation Types – Compressive Resistance 210 kPa (30 psi) or Less							
CAN/ULC-S701 Type No.	**1**	**2**	**2**	**3**	**3**	**3**	**4**
Insulation Type	**PlastiSpan**	**PlastiSpan HD**	**XPS**	**PlastiSpan 25**	**XPS**	**PlastiSpan 30**	**XPS**
Compressive resistance *Minimum, kPa (psi)*	**70 (10)**	**110 (16)**	110 (16)	**170 (25)**	140 (20)	**210 (30)**	210 (30)
Thermal resistance *Minimum per 25 mm (inch), $m^2 \cdot °C/W$ ($ft^2 \cdot hr \cdot °F/BTU$)*	**0.65 (3.75)**	**0.70 (4.04)**	LTTR Design Value	**0.74 (4.27)**	LTTR Design Value	**0.74 (4.27)**	LTTR Design Value
Long Term Thermal Resistance *Minimum per 50 mm (2-inch), $m^2 \cdot °C/W$ ($ft^2 \cdot hr \cdot °F/BTU$)*	**LTTR Not Applicable**	**LTTR Not Applicable**	1.62 (9.4)	**LTTR Not Applicable**	1.62 (9.4)	**LTTR Not Applicable**	1.66 (9.6)
RSI (R-value) warranty *Minimum % of Original*	**50-Year 100%**	**50-Year 100%**	None Published	**50-Year 100%**	None Published	**50-Year 100%**	None Published
Water vapour permeance *Maximum, $ng/Pa \cdot s \cdot m^2$ (Perm)*	**300 (5.0)**	**200 (3.5)**	90 (1.5)	**130 (2.3)**	90 (1.5)	**130 (2.3)**	90 (1.5)
Dimensional stability *Maximum % linear change*	**1.5**	**1.5**	1.5	**1.5**	1.5	**1.5**	1.5
Flexural strength *minimum, kPa (psi)*	**170 (25)**	**240 (35)**	240 (35)	**300 (44)**	300 (44)	**350 (50)**	350 (50)
Water absorption *Maximum % by volume*	**4.0**	**3.0**	0.7	**2.0**	0.7	**2.0**	0.7
Standard Dimensions, mm (in.)							
Length	**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)
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)**	25.4 (1)
Maximum	**1220 (48)**	**1220 (48)**	101.6 (4)	**1220 (48)**	101.6 (4)	**1220 (48)**	101.6 (4)

CAN/ULC-S701 PlastiSpan and XPS Insulation Types – Compressive Resistance Greater Than 210 kPa (30 psi)				
CAN/ULC-S701 Type No.	**3**	**4**	**3**	**4**
Insulation Type	**PlastiSpan 40**	**XPS**	**PlastiSpan 60**	**XPS**
Compressive resistance *Minimum, kPa (psi)*	**276 (40)**	276 (40)	**414 (60)**	414 (60)
Thermal resistance *Minimum per 25 mm (inch), $m^2 \cdot °C/W$ ($ft^2 \cdot hr \cdot °F/BTU$)*	**0.76 (4.3)**	LTTR Design Value	**0.76 (4.3)**	LTTR Design Value
Long Term Thermal Resistance *Minimum per 50 mm (2-inch), $m^2 \cdot °C/W$ ($ft^2 \cdot hr \cdot °F/BTU$)*	**LTTR Not Applicable**	1.66 (9.6)	**LTTR Not Applicable**	1.66 (9.6)
RSI (R-value) warranty *Minimum % of Original*	**50-Year 100%**	None Published	**50-Year 100%**	None Published
Water vapour permeance *Maximum, $ng/Pa \cdot s \cdot m^2$ (Perm)*	**130 (2.3)**	60 (1.1)	**130 (2.3)**	60 (1.1)
Dimensional stability *Maximum % linear change*	**1.5**	1.5	**1.5**	1.5
Flexural strength *minimum, kPa (psi)*	**414 (60)**	414 (60)	**517 (75)**	517 (75)
Water absorption *Maximum % by volume*	**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)