

Preface

Spray-Applied Rigid Polyurethane Foam Insulation, Medium Density

Scope

This Evaluation Listing applies to spray-applied rigid polyurethane foam, medium density, intended for use as thermal insulation for both building and non-building applications, whether applied on a building site or in a prefabrication (manufacturing) process. This material is also known as foamed in-situ insulation. The continuous-use temperature is within the range -60°C to $+80^{\circ}\text{C}$.

The proponent has demonstrated that the product meets at least one of the following standards (see Table 1 for their performance requirements):

- CAN/ULC-S705.1-01, "Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material – Specification";
- CAN/ULC-S705.1-01 (including Amendment 1), "Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material – Specification"; or
- CAN/ULC-S705.1-01 (including Amendments 1 and 2), "Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material – Specification."

Spray-applied rigid polyurethane foam, medium density, shall be installed by a licensed installer in accordance with the manufacturer's instructions and one of the following standards:

- CAN/ULC-S705.2-98, "Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density, Installer's Responsibilities – Specification;" or
- CAN/ULC-S705.2-05, "Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Application."

For compliance to CAN/ULC-S705.2, users should contact the third-party organization that has been identified by the foam manufacturer as the third party operating the field quality assurance program for the foam product (see product listing).

Standard

Table 1. Performance Requirements for Physical Properties (applicable to CAN/ULC-S705.1 with and without the amendments, unless indicated otherwise in the notes to Table 1)

Property	Unit	Requirement	
		Minimum	Maximum
Air permeance (mandatory material testing)	L/s @ 75 Pa	No min.	0.02
Air permeance (optional system testing)	L/s @ 75 Pa	No min.	0.05
Apparent core density	kg/m ³	28	No max.
Compressive strength	kPa	170	No max.
Dimensional stability volume change at:			
• -20°C	%	No min. (¹)	-1
• 100°C ⁽¹⁾	%		+10 ⁽¹⁾
• 70°C, 97 ± 3% RH	%	No min.	+14
Surface burning characteristics			
• flame spread	No units	No min.	500 ⁽²⁾
Open-cell content volume	%	No min.	8
Initial thermal resistance of a 50-mm-thick specimen after a minimum of 2 d and a maximum of 14 d at 23±2°C ⁽³⁾	m ² ·°C/W	2.5 ⁽³⁾	No max.
Conditioned thermal resistance ⁽⁴⁾ of a 50-mm-thick specimen after			
• 180 d at 23±2°C or	m ² ·°C/W	Declare	No max.
• 90 d at 60±2°C			
Long-term thermal resistance of a 50-mm-thick specimen	m ² ·°C/W	2.0 ⁽⁵⁾	No max.
Tensile strength	kPa	200	No max.
Volatile organic emissions	No units	Pass ⁽⁶⁾	No max.
Water absorption by volume	%	No min.	4
Water vapour permeance of a 50-mm-thick specimen	ng/(Pa·s·m ²)	No min.	60 ⁽⁷⁾

Notes to Table 1:

- (1) CAN/ULC-S705.1-01 (including Amendments 1 and 2) requires 80°C instead of 100°C and a related minimum of -1% and maximum of +8%.
- (2) Results are valid for qualification to the standard. As noted in the standard, “for building code purposes, the flame-spread rating shall be conducted in accordance with the code-specified flame-spread test details with respect to the number of specimens to be tested, specimens tested intact and cut specimens.”

- (3) CAN/ULC-S705.1-01 (including Amendments 1 and 2) requires that the initial thermal resistance of a 50-mm-thick specimen be tested after 3 d at $23\pm 2^{\circ}\text{C}$ and that the value be reported. No minimum value is required.
- (4) The conditioned thermal resistance test is required only for CAN/ULC-S705.1-01 (including Amendments 1 and 2).
- (5) CAN/ULC-S705.1-01 (including Amendments 1 and 2) requires a minimum of $1.8 \text{ m}^2\cdot^{\circ}\text{C}/\text{W}$ for the product to be classified as Type 1 and a minimum of $2.0 \text{ m}^2\cdot^{\circ}\text{C}/\text{W}$ to be classified as Type 2.
- (6) "Pass" means that after 30 days the volatile compound emissions do not exceed the maximum indoor air concentration stated in Table 2 of CAN/ULC-S705.1.

In cases of retrofit construction (e.g. occupied buildings), CAN/ULC-S705.2-05 requires that a ventilation rate of 0.3 air changes be provided within the working area during the application of the product and that the working area be isolated during spraying. The same ventilation rate is required after the product has been sprayed and for the time period determined in accordance with the CAN/ULC-S705.1 (see the product listing for the time period required before occupancy).

- (7) To satisfy the maximum water vapour permeance requirement of $60 \text{ ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$, a minimum thickness of 50 mm of foam insulation must be sprayed over gypsum boards and a minimum thickness of 20 mm of foam insulation must be sprayed over concrete blocks.

Labeling

In compliance with the CAN/ULC-S705.1-01 standard, each liquid component container shall be identified as either polyisocyanate component ("A") or resin component ("B"). Unless otherwise specified, each container shall be marked with the following information:

- manufacturer's name;
- product name;
- type of material (e.g. insulation);
- net mass of the contents of the packaged material;
- country of manufacture;
- lot number;
- date of manufacture;
- "use before" date;
- the means to identify their installed product; and
- conformance with "CAN/ULC-S705.1."

National Building Code of Canada (NBC)

NBC References

The CAN/ULC-S705.1-01 standard is referenced in the NBC 2005, Table 5.10.1.1. and Clause 9.25.2.2.(1)(g).

The CAN/ULC-S705.2-05 standard is not referenced in the NBC 2005.

The CAN/ULC-S705.2-98 is referenced in the NBC 2005, Sentence 5.3.1.3.(3), Table 5.10.1.1. and Sentence 9.25.2.5.(1).