

**CAN/ULC-S712.2:2017**

**STANDARD FOR THERMAL INSULATION – LIGHT DENSITY,  
OPEN CELL SPRAY APPLIED SEMI-RIGID POLYURETHANE  
FOAM – INSTALLATION**

Prepared and Published by:



Approved by:



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**STANDARD FOR THERMAL INSULATION – LIGHT DENSITY, OPEN  
CELL SPRAY APPLIED SEMI-RIGID POLYURETHANE FOAM –  
INSTALLATION**

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Prepared and Published by:



Approved by:



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## **STANDARD FOR THERMAL INSULATION – LIGHT DENSITY, OPEN CELL SPRAY APPLIED SEMI-RIGID POLYURETHANE FOAM – INSTALLATION**

### **PREFACE**

This is the First Edition of the Standard for Thermal Insulation – Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam – Installation, CAN/ULC-S712.2.

This Edition of the Standard has been formally approved by the ULC Standards Committee on Thermal Insulation Materials and Systems.

This Standard has been developed in compliance with the requirements of SCC for accreditation of a Standards Development Organization.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

Annexes A, B, C, D, E, F, G, H, I, J and K, identified as Normative, form a mandatory part of this Standard.

Annex L, identified as Informative, is for information purposes only.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Attention is drawn to the possibility that some of the elements of this Canadian standard may be the subject of patent rights. ULC Standards shall not be held responsible for identifying any or all such patent rights.

Requests for interpretation of this Standard should be sent to ULC Standards. The requests should be worded in such a manner as to permit a “yes” or “no” answer based on the literal text of the requirement concerned.

The review and action to revise or reaffirm this Standard will not exceed 5 years from the date of publication, unless the Standard is identified as fitting within a stabilized category, whereby the review will commence within the appropriate time frame set out by ULC Standards.

This Standard is intended to be used for conformity assessment.

## 1 SCOPE

1.1 This Standard specifies the requirements for the on-site manufacture and installation of *light density, open cell spray applied semi-rigid polyurethane foam* to produce a material that meets the physical property requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification. The material only has the physical properties listed in CAN/ULC-S712.1 when it is installed on-site in accordance with this Standard.

1.2 The spray polyurethane foam system *installer* site-manufactures the *light density, open cell spray applied semi-rigid polyurethane foam* material identified by CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification. The spray polyurethane foam system manufacturer produces a liquid "resin" component and supplies the corresponding polymeric isocyanate. When mixed together on a fixed ratio basis, these two components produce the material which possesses the physical properties listed in CAN/ULC-S712.1. This Standard includes mandatory requirements for the installation of the material as well as qualification of *contractors* and the qualification of *installers* which form an integral part of the manufacturing process to produce the finished material.

1.3 This Standard applies to the manufacture and installation of *light density, open cell spray applied semi-rigid polyurethane foam* whether applied on a building site or in a prefabrication (manufacturing) facility.

NOTE: Under certain conditions the requirements may be applicable to non-building applications. In this case it is recommended that the system *supplier* and the consumer agree on the specifics of the installation.

1.4 There are requirements for the *supplier*, the *contractor* and the *installer* provided in this Standard including verification of the material properties of the *light density, open cell spray applied semi-rigid polyurethane foam* system on-site, the installation process, quality control measures, documentation of the installation, limitations for the installation, site safety and disposal of associated waste.

1.5 This Standard is limited to installation in open cavities with framing members on each side of the cavity and where the cavity can be visually inspected before and after the material is installed. Injection into closed cavities was considered for this Standard but is not permitted under the scope of this Standard.

1.6 This Standard does not purport to address all the health and safety aspects associated with the site manufacture and installation of *light density, open cell spray applied semi-rigid polyurethane foam*. Anyone using this Standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any existing applicable regulatory requirements, prior to its use.

## 2 REFERENCE PUBLICATIONS

2.1 The documents shown below are referenced in the text of this Standard. Unless otherwise stated elsewhere in this Standard such reference shall be considered to indicate the edition and/or revisions of the document available at the date on which the Committee approved this ULC Standard.

Documents Published by the International Organisation for Standardization (ISO) available from:

ISO Central Secretariat: International Organisation for Standardization (ISO)  
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- ISO 9001:2008, Quality management systems – Requirements
- ISO 10002:2014, Quality management – Customer satisfaction – Guidelines for complaints handling in organizations
- ISO/IEC 17020:2012, General criteria for the operation of various types of bodies performing inspection
- ISO/IEC 17024:2012, Conformity assessment – General requirements for bodies operating certification of persons
- ISO 12576-2:2008, Thermal insulation – Insulating materials and products for buildings – Conformity control systems – Part 2: Site manufactured products

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- CAN/ULC-S508-02 (R2013), Standard for the Rating and Fire Testing of Fire Extinguishers
- CAN/ULC-S712.1:2016, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam – Material Specification
- CAN/ULC-S773-15, Standard for Thermal Insulation Terminology

### 3 TERMINOLOGY

NOTE 1: Definitions and symbols used in this specification are found in CAN/ULC-S773, Standard for Thermal Insulation Terminology. Definitions from CAN/ULC-S773 have been listed below and are identified as such. Additional definitions not currently listed in CAN/ULC-S773 but required for this Standard have been listed below.

NOTE 2: Terms used in this Standard that are in *italic* print are defined as follows:

3.1 **APPRENTICE INSTALLER (APPRENTICE)** — individual who installs spray polyurethane foam on the job site, under direct supervision of a qualified *open cell spray polyurethane foam installer*.

3.2 **AUTHORITY HAVING JURISDICTION (AHJ)** — representative of a governmental (federal, provincial, or municipal) agency predominantly involved in regulating by statute the use of products, materials and services (CAN/ULC-S773).

3.3 **CERTIFICATION ORGANIZATION (CO)** — organization accredited to ISO/IEC 17024, Conformity assessment – General requirements for bodies operating certification of persons, and ISO/IEC 17020, General criteria for the operation of various types of bodies performing inspection, by an organization which is member of the IAF/ILAC Multilateral Agreement (such as Standards Council of Canada),

possessing the necessary competence and reliability to operate an *installer* certification system and inspection system in which the interests of all parties concerned with the functioning of the system are represented.

**3.4 EQUIPMENT SUPPLIER** — manufacturer or distributor of equipment designed for spray-installation of polyurethane foam.

**3.5 EXPIRY DATE** — date declared by the *spray polyurethane foam system supplier* after which the resin shall not be used.

**3.6 LIGHT DENSITY, OPEN CELL SPRAY APPLIED SEMI-RIGID POLYURETHANE FOAM (SPRAY FOAM MATERIAL)** — semi-rigid cellular plastic material that is formed in place by the catalyzed reaction of polyisocyanates and polyhydroxyl compounds, expanded with non-captive blowing agents and producing a predominantly open-cell material with a density between 6.8 to 12 kg/m<sup>3</sup>.

**3.7 QUALIFIED LIGHT DENSITY, OPEN CELL SPRAY APPLIED SEMI-RIGID POLYURETHANE FOAM CONTRACTOR (CONTRACTOR)** — individual, organization or corporation responsible for meeting all requirements and obligations for the installation of *light density, open cell spray applied semi-rigid polyurethane foam* outlined in this Standard to produce a material which meets the requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification, and accredited and licensed by a CO.

**3.8 OPEN CELL SPRAY POLYURETHANE FOAM INSTALLER (INSTALLER)** — person who, through training or experience, has demonstrated the knowledge, skills and abilities to perform the required functions and tasks to produce the finished material on-site.

NOTE: The user should be aware that in Canada the *AHJ* may require these persons to obtain certification.

**3.9 SITE QUALITY ASSURANCE PROGRAM (SQAP)** — program (outlined in Annex A) based on ISO 9001, Quality management systems – Requirements, and ISO 12576-2, Thermal insulation - Insulating materials and products for buildings - Conformity control systems - Part 2: Site manufactured products, administered by the *CO*, which ties the *supplier*, the *contractor* and the *installer* together and makes them responsible for the on-site manufacture and installation of *light density, open cell spray applied semi-rigid polyurethane foam*, states the responsibilities and obligations of each of the three parties, states the training, certification, accreditation requirements and describes requirements for a site audit of the installation of *light density, open cell spray applied semi-rigid polyurethane*.

**3.10 SPRAY POLYURETHANE FOAM SYSTEM SUPPLIER (SUPPLIER)** — a manufacturer or distributor responsible for the liquid chemical system (resin and polymeric isocyanate) which is designed to be mixed and sprayed to form spray polyurethane foam material in-situ.

**3.11 TIME TO OCCUPANCY** — period of time required after installation of the material where that portion of the inhabited building shall be isolated, exhaust ventilated and uninhabited.

## 4 REQUIREMENTS

### 4.1 SUPPLIER

**4.1.1** The manufacturer shall blend a resin that when combined with the appropriate polymeric isocyanate shall provide a material prequalified in a laboratory that meets the requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification.

4.1.2 The *supplier* shall be responsible for tracking the resin and the polymeric isocyanate containers to the *contractor* and then the installation address whether supplied directly to the *contractor*, through a distributor or private labelling agreement.

4.1.3 The *supplier* shall uniquely identify the material and label the shipping containers to declare that the material meets the requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification, the date of manufacture and *expiry date* as required in Section 7, Manufacturer's Documentation, of CAN/ULC-S712.1. Where product is delivered in bulk, the *supplier* shall provide documentation to the *contractor* which includes the same information.

4.1.4 The *supplier* shall declare the *CO* responsible for administering the *SQAP* (refer to Annex A).

4.1.5 The *supplier* shall ensure that the material is installed by a *contractor* using an *installer* in accordance with the *SQAP*.

## 4.2 CONTRACTOR

4.2.1 The *contractor* shall procure the material that meets the requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification, and shall comply with all requirements of this installation Standard.

4.2.2 The *contractor* shall procure from a *supplier* a matching set of liquid chemicals (both polymeric isocyanate and resin) which meet the requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification.

4.2.3 The *contractor* shall confirm that the selected *spray foam material* is appropriate for the application.

4.2.4 The *contractor* shall verify, through the use of drum labels or other documentation that the liquid resin received is labelled as conforming with CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification, and that the material is used by the *expiry date*.

4.2.5 The *contractor* shall have at least one *installer* on each job site during the installation.

4.2.6 The *contractor* shall ensure that the *installer* has successfully completed a training course approved by the *supplier* and is qualified by successfully passing both a written examination and a field examination.

4.2.7 The *contractor* shall provide the *installer* with all the equipment in good working order to complete the installation including but not limited to transfer pumps, a proportioner unit, hoses, hose heaters, spray guns, compressors and generators.

4.2.8 The *contractor* shall maintain the equipment for installation in working order.

4.2.9 The *contractor* shall ensure that the *installer* has personal protective equipment (PPE) including a positive pressure fresh air supplied full face respirator, head protection, eye protection, ear protection, body protection, hand protection and foot protection in compliance with appropriate health and safety regulations.

4.2.10 The *contractor* shall ensure that at the end of each working day, all *spray foam material* waste is removed from the construction site and disposed of in a safe manner, in accordance with local, provincial and federal requirements.

4.2.11 The *contractor* shall ensure that all empty liquid chemical containers are removed or stored in accordance with this Standard at the end of each working day. Requirements for container disposal are listed in Annex F.

4.2.12 The *contractor* shall provide on each job site, a test kit meeting the requirements outlined in Annex I for use by the *installer* to conduct the daily testing required by this Standard. The *contractor* shall ensure the *installer* conducts the daily quality control testing outlined in Section 5, On-Site Testing.

4.2.13 The *contractor* shall supply the *installer* with the necessary documents and forms in order to comply with the requirements in this Standard.

4.2.14 The *contractor* shall ensure that the Daily Work Record is completed for each job site and each time a new batch of resin is used. An additional Daily Work Record shall be completed when installing *spray foam material* on the same job site for more than 4 h and every 4 h after that.

4.2.15 The *contractor* shall ensure the *installer* completes a Daily Work Record in accordance with this Standard. The minimum information required for a Daily Work Record is shown in Annex G.

4.2.16 The *contractor* shall keep the Daily Work Records for a period of seven years. The Daily Work Records shall be made available upon request (within a reasonable time) to the *supplier* or the *CO*.

4.2.17 A Job Site Label containing the minimum information outlined in Annex K shall be provided to the *installer* to be attached in a prominent location at the job site. Locations such as the electrical panel are acceptable.

4.2.18 The *contractor* shall ensure that the *installer* complies with the *SQAP* (refer to Annex A).

4.2.19 If the *contractor* is not installing the required thermal barrier, the *contractor* shall notify, in writing, the building owner or the owner's representative of the requirement for a thermal barrier and about the flammability hazard which could exist until such time that the *spray foam material* is covered. This written notice shall be provided before the installation commences. A sample letter is located in Annex J.

4.2.20 If the *contractor* is not installing the required vapour barrier, the *contractor* shall notify, in writing, the building owner or the owner's representative of the requirement for a vapour barrier over *spray foam material*. This letter shall be provided before the installation commences. A sample letter is located in Annex J.

4.2.21 If the *contractor* is not installing the required air barrier system, the *contractor* shall notify, in writing, the building owner or the owner's representative of the requirement for an air barrier system with *spray foam material*. This letter shall be provided before the installation commences. A sample letter is located in Annex J.

### 4.3 INSTALLER

4.3.1 The *installer* shall ensure proper site installation (refer to Subsection 4.7, Installation), safe handling and storage of the chemicals (refer to Annex E6), isolation of the spray area (refer to Annex C5), warning signs when spray is in progress (refer to Annex C2), site housekeeping (refer to Annex C3), and their own personal and the crew's health and safety (refer to Annex E) with respect to the installation of the *spray foam material*.

4.3.2 The *installer* shall produce a *spray foam material* that meets the physical property requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification, and shall follow the instructions provided by the *supplier* and the *contractor*.

4.3.3 The *installer* shall confirm that the resin and polymeric isocyanate containers on the site are labelled with "CAN/ULC-S712.1" before commencing installation.

4.3.4 The *installer* shall confirm that the *expiry date* of the resin has not been reached and shall not install any chemicals that have exceeded the *expiry date*.

4.3.5 The *installer* shall wear PPE in compliance with applicable health and safety regulations, which include a positive pressure fresh air supplied full face respirator, head protection, eye protection, ear protection, body protection, hand protection and foot protection. The *installer* shall ensure that any person within 10 m of the spray gun shall be fully protected with the same PPE.

4.3.6 The *installer* shall have completed a training course approved by the *supplier*. The requirements for the essential learnings are listed in Annex E.

4.3.7 The *installer* shall demonstrate to the *CO* that they possess the knowledge, skills and abilities required to perform the functions and tasks as an *installer*. The *installer* shall obtain certification from the *CO*.

4.3.8 The *installer* shall follow instructions from the *equipment supplier* for the operation, maintenance, cleaning and safety procedures of the equipment used for installation.

4.3.9 The *installer* shall:

- A Verify that the substrate conforms to the requirements in Annex B;
- B Verify that the environmental conditions are within the range approved by the *supplier*;
- C Set the equipment to the operating parameters as recommended by the *supplier* to produce optimum quality *spray foam material*;
- D Install the *spray foam material* in accordance with this Standard and the *supplier's* instructions;
- E For inhabited buildings, isolate and ventilate the area being sprayed during and after installation in accordance with Annex C5;
- F Comply with all of the *installer's* requirements of the *SQAP* in Annex A; and
- G Verify that all handling and safety requirements in Annex E have been met.

4.3.10 The *installer* shall check the thickness of the *spray foam material* on a continual basis and provide the minimum thickness specified by the contract documents.

4.3.11 The material shall be trimmed flush to the surface of the framing members, if required to accommodate a finish material.

4.3.12 The *installer* shall exercise an ongoing visual and physical quality control check throughout the installation to confirm adhesion to the substrate and the absence of shrinkage, release from stud, or air pockets (refer to Annex D).

4.3.13 The *installer* shall conduct density, adhesion and substrate verification for each job site or each time a batch of resin is changed. Further testing is required when installing on the same job site for more than 4 h and at each 4 h interval.

4.3.14 The *installer* shall complete a Daily Work Record in accordance with this Standard. This Daily Work Record shall contain information on the job site, date, name of the *supplier*, name of the *installer*, certification number, installation conditions, environmental conditions, results of the on-site testing, whether the resin containers were labelled “CAN/ULC-S712.1”, whether the project required isolation and ventilation and whether the *spray foam material* has been evaluated by a third party. The Daily Work Record shall be completed for each job site or each time a batch of resin is changed. An additional Daily Work Record is required when installing on the same job site for more than 4 h and at each 4 h interval. The minimum information required for a Daily Work Record is shown in Annex G.

4.3.15 A Job Site Label containing the minimum information outlined in Annex K, must be attached by the *installer* in a prominent location at the job site when the installation has been completed. Locations such as the electrical panel are acceptable.

4.3.16 The *installer* shall, at the end of each working day, remove all *spray foam material* waste from the construction site and dispose of the waste in a safe manner, in accordance with local, provincial and federal requirements.

4.3.17 The *installer* shall remove or store empty liquid chemical containers in accordance with this Standard at the end of each day. Requirements for container disposal are listed in Annex F.

4.3.18 In cases where an *apprentice* is installing the *spray foam material*, the *apprentice* shall be under the direct supervision of the *installer* who has the responsibility for the installation.

## 4.4 APPRENTICE INSTALLER

4.4.1 The *apprentice* shall only install *spray foam material* when under the direct on-site supervision of an *installer*.

4.4.2 The *apprentice* shall satisfy all installation requirements of this Standard.

4.4.3 When installing or within a 10 m radius of the spray gun, the *apprentice* shall wear PPE, which includes a positive pressure fresh air supplied full face respirator, head protection, eye protection, ear protection, body protection, hand protection and foot protection in compliance with appropriate health and safety regulations (refer to Annex E).

## 4.5 MATERIAL

4.5.1 The liquid resin, when stored in accordance with the *supplier's* instructions, mixed with the appropriate polymeric isocyanate and sprayed as in Clause 4.3.9 before the *expiry date* of the resin as declared by the *supplier*, shall produce the final *spray foam material* meeting the requirements of CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification.

4.5.2 When installed according to the requirements of Clause 4.3.9, the *spray foam material* shall not have any objectionable residual odour after the *time to occupancy* in accordance with CAN/ULC-S712.1, Standard for Thermal Insulation - Light Density, Open Cell Spray Applied Semi-Rigid Polyurethane Foam - Material Specification.

## 4.6 EQUIPMENT

4.6.1 The equipment used to mix and spray the liquid chemicals shall be a commercially available spray gun with a fixed-ratio, positive displacement proportioning unit, designed for the installation of *spray foam material* recommended by the *supplier*.