



**National Research
Council Canada**

**Conseil national
de recherches Canada**

Institute for
Research in
Construction

Institut de
recherche en
construction

CCMC 12697-R



*EVALUATION
REPORT*

DIVISION	07216.4
Issued	1995-09-13
Re-evaluated	2005-11-25
Re-evaluation due	2007-09-13

SEALECTION 500®

Demilec Inc.
870, Curé-Boivin
Boisbriand (Québec)
J7G 2A7

Tel.: (450) 437-0123
(866) 437-0223
Fax: (450) 437-2338

Plant: Base Materials
Boisbriand (Québec)

Plant: Finished product
Site Manufactured

1. Purpose of Evaluation

The proponent sought confirmation from the Canadian Construction Materials Centre (CCMC) that “SEALECTION 500®” can serve as a thermal insulation material in compliance with the intent of the National Building Code of Canada (NBC) 1995.

2. Opinion

Subject to the limitations and conditions stated in this report, test results and assessments provided by the proponent show that “SEALECTION 500®” complies with CCMC’s Technical Guide for Spray-in-Place, Open-Cell Polyurethane Foam (OPF) Thermal Insulation, Masterformat number 07216.4, dated 02-02-28, and provides a level of performance equivalent to that required in:

- NBC 1995, Article 9.25.2.2. and Sentence 5.3.1.2.(2)

This Report is provided without representation, warranty, or guarantee of any kind, expressed or implied, and the National Research Council of Canada (NRC) provides no endorsement for any evaluated material, product, system or service described herein.

NRC has evaluated the material, product, system or service described herein only for those characteristics stated herein. The information and opinions in this Report are directed to those who have the appropriate degree of experience to use and apply its contents.

NRC accepts no responsibility whatsoever arising in any way from any and all use or reliance on the information contained in this Report. NRC is not undertaking to render professional or other services for or on behalf of any person or entity nor to perform any duty owed by any person or entity to another person or entity.

Ruling No. 95-10-29-(12697-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 10 November 1995 pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions).

Canada Mortgage and Housing Corporation permits the use of this product in construction financed or insured under the National Housing Act.

3. Description

“SEALECTION 500®” is a spray-in-place, low-density, semi-flexible plastic foam that has an open cell structure. The foaming system consists of two components, A100 isocyanate and B500 resin, that are mixed on site by a qualified installer with fixed-ratio positive displacement equipment.

Upon completion of “SEALECTION 500®” expansion, the open cells contain air. The chemical reaction that occurs while the product is being installed takes place in seconds, with less than 15 minutes needed for curing. After curing, “SEALECTION 500®” remains semi-flexible.

The final cured product is yellowish in colour and shall have a density of 7.6 kg/m³. At a 25.4 mm thickness, the design thermal resistance is 0.6 m²·°C/W.

4. Usage and Limitations

As specified by the manufacturer, “SEALECTION 500®” insulation shall be manufactured on-site by Canadian Urethane Foam Contractors’ Association (CUFCA)-trained installers specified by Demilec Inc. with subsequent field auditing of installers by CUFCA¹. CUFCA is the third-party certification organization specified by Demilec Inc. to provide the training program and provide follow-up inspection of qualified installers who are licensed to spray semi-flexible urethane-based foam insulation in accordance with the “SEALECTION 500®” Installer’s Manual.

1. Periodic CUFCA audits of the installer are conducted. In cases where the installation is deemed non-conforming and is not being remedied

by the installer, CUFCA will inform the owner, architect and building official of the non-conforming installation.

The CUFCA policy is to conduct occasional random inspections and mandatory inspections of larger projects. Building officials may contact CUFCA (1-866-GO-SPRAY) and require an inspection for a specific job site if the building official deems it necessary.

All qualified installers shall provide, upon request, photo identification to the building official as proof that they are qualified by CUFCA.

The installation shall be done according to the Sealection 500® Installer’s Manual, a copy of which shall be available at the job site at all times during the installation for review by the building official.

This product can be used in new construction or retrofit, and is subject to the following conditions:

- The product is intended for installation in ‘open’ cavities of the building envelope where insulation is required as per the NBC 1995 (i.e. walls, floors, roofs). All applications must be carried out from the interior space of the building; no exterior applications are permitted. Some typical applications are illustrated in Figures 1 to 3.
- For retrofit applications, the working area shall be put in a negative pressure by an exfiltration rate of 0.3 air changes per hour (ach) for at least two (2) days. Based on an independent toxicological assessment, the specified ventilation must be in effect for two (2) days before an occupancy is permitted in the newly insulated suite.
- The sprayed material should completely cover the surfaces between the studs, joists, and other framing members. The surfaces to be covered should be clean, dry, and free of frost, oil, grease, dust or other unsuitable material. As required in Article 9.25.2.3. of the NBC 1995, the insulation shall be installed so that there is a reasonably uniform insulating value over the entire face of the insulated area.

-
- The insulation product is not exempt with the requirements for vapour barrier, air barrier protection and dampproofing (interior below-grade walls) as required in Article 9.13.3.3. of the NBC 1995.
 - The interior side of the applied semi-flexible polyurethane insulation shall be covered with an approved thermal barrier as per applicable Article 9.10.16.10. or 3.1.5.11. of the NBC 1995.
 - The insulation should be kept at least 75 mm, or as required in building regulations and safety codes, from heat-emitting devices such as recessed light fixtures and chimneys.
 - The maximum in-service temperature of the insulation shall not exceed 70°C.
 - This product may not be used where it may be in contact with water and shall not be installed after its expiry date (6 months from the date of manufacture).
 - The components, "SEALECTION 500® A100 isocyanate" and "SEALECTION 500® B500 resin," must have their respective containers (i.e. drums) identified by the phrase "CCMC 12697-R."

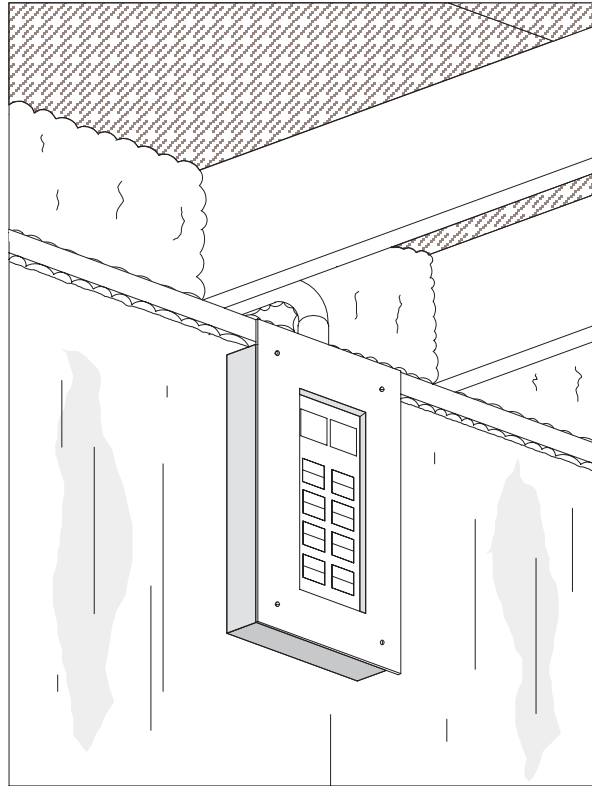


Figure 1. "SEALECTION 500®" Insulation

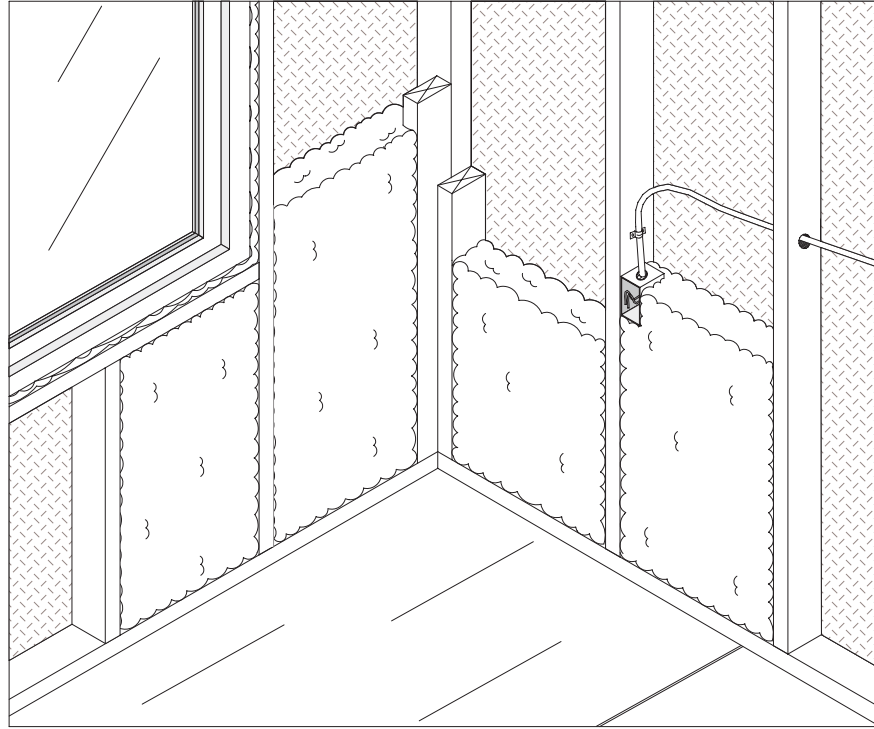


Figure 2. "SEALECTION 500®" Insulation

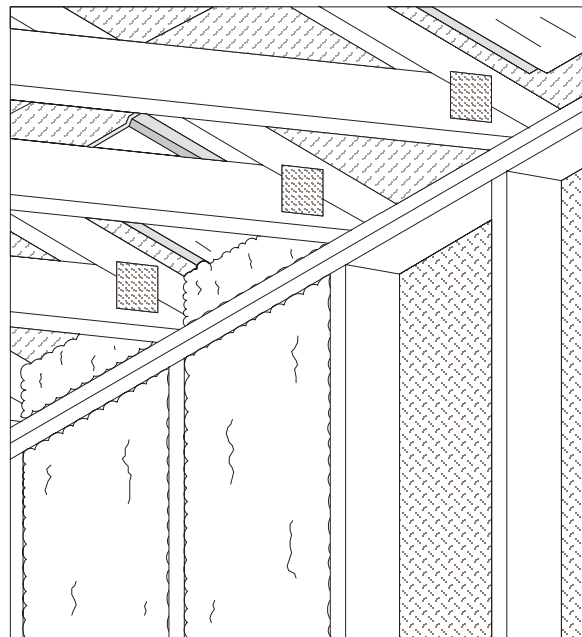


Figure 3. "SEALECTION 500®" Insulation

5. Performance

Testing was conducted by laboratories recognized by the Canadian Construction Materials Centre. The results of testing “SEALECTION 500®” are summarized in Tables 1 and 2.

Table 1. Test Results for “SEALECTION 500®”

Property and/or Test Method	Requirement		Results
Density ASTM D 1622 (kg/m ³)	report value		7.37 ⁽¹⁾
Thermal Resistivity ASTM C 518 (m ² ·K/W/m)	report value		23.68 ⁽¹⁾
Water Vapour Transmission (ng/Pa·s·m ²) ASTM E 96 (thickness = 25 mm)	> 2800		1300 ⁽²⁾ (average of 3 tests)
Dimensional Changes (% volumetric) when exposed to:	See Note 3		-11.3 (average of 3 tests) -11.4 (average of 3 tests) -0.7 (average of 3 tests)
	Min.	Max.	
	80°C and ambient R.H.	-15 +10	
	70°C and 95% R.H.	-15 +14	
	-29°C and ambient R.H.	-1	
Emissions During Aging	See Note 4		Pass

Notes to Table 1:

1. Although the density value presented here is less than 7.6 kg/m³, the 7.6 kg/m³ is the density value that applies to the measured thermal value. Since this is a site-manufactured product, it is the responsibility of the installer to deliver, through field-testing verification, the 7.6 kg/m³ design density for the published thermal value.
2. Although the water vapour permeance is below the specified target, additional testing to simulate service conditions for the service life of this proprietary product was conducted. The resulting performance was deemed acceptable.
3. Limits for dimensional change under these accelerated test conditions were not established for this product. The results were compared to the limits for sprayed polyurethane foam insulation products.
4. The Volatile Organic Compound (VOC) emissions under consideration were measured with an assumed room ventilation rate of 0.3 air changes per hour in accordance with the test procedure to represent the NBC requirements for new construction. The determination of emissions and room concentration calculations were done by the Saskatchewan Research Council. An independent toxicological report recommends a residential time-to-occupancy of 2 days. While the testing and evaluation represent the current state-of-the-art in toxicological evaluation, such tests and their results do not purport to be conclusive with respect to the impact on health.

Table 2. Additional Information on “SEALECTION 500®” Properties

Property and/or Test Method	Requirement	Results
Compressive Strength (kPa)	report value	5.0
Tensile Strength (kPa)	report value	17.0
Water Absorption by Volume (%)	report value	47.9
Flame Spread Rating CAN/ULC-S102	report value	335

For additional information contact:

Bruno Di Lenardo, P.Eng.
(613) 993-7769

Note: Readers are asked to refer to limitations imposed by NRC on the interpretation and use of this report. These limitations are included in the introduction to CCMC’s Registry of Product Evaluations, of which this report is part.

Readers are advised to confirm that this report has not been withdrawn or superseded by a later issue by referring to <http://irc.nrc.gc.ca/ccmc>, or contacting the Canadian Construction Materials Centre, Institute for Research in Construction, National Research Council of Canada, Montreal Road, Ottawa, Ontario, K1A 0R6; Telephone (613) 993-6189, Fax (613) 952-0268.

*Issued by the Institute for Research in Construction
under the authority of the National Research Council*

John Flack, Ph.D.
Manager, CCMC