



## Evaluation Report CCMC 13249-R GacoInsulBarrier

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### 1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “GacoInsulBarrier”, when used as insulation material in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2010:

- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
  - Clause 9.25.2.2.(1)(g) Insulation Materials

This opinion is based on CCMC's evaluation of the technical evidence in Section 4.1 provided by the Report Holder.

Ruling No. 07-18-176 (13249-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 2007-07-27 pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

### 2. Description

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

Once the product has expanded, 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 the product remains semi-flexible.

The final cured product is yellow and has a density of 8.09 kg/m<sup>3</sup>. At 25.4 mm thick, the design thermal resistance is 0.64 m<sup>2</sup>·K/W.

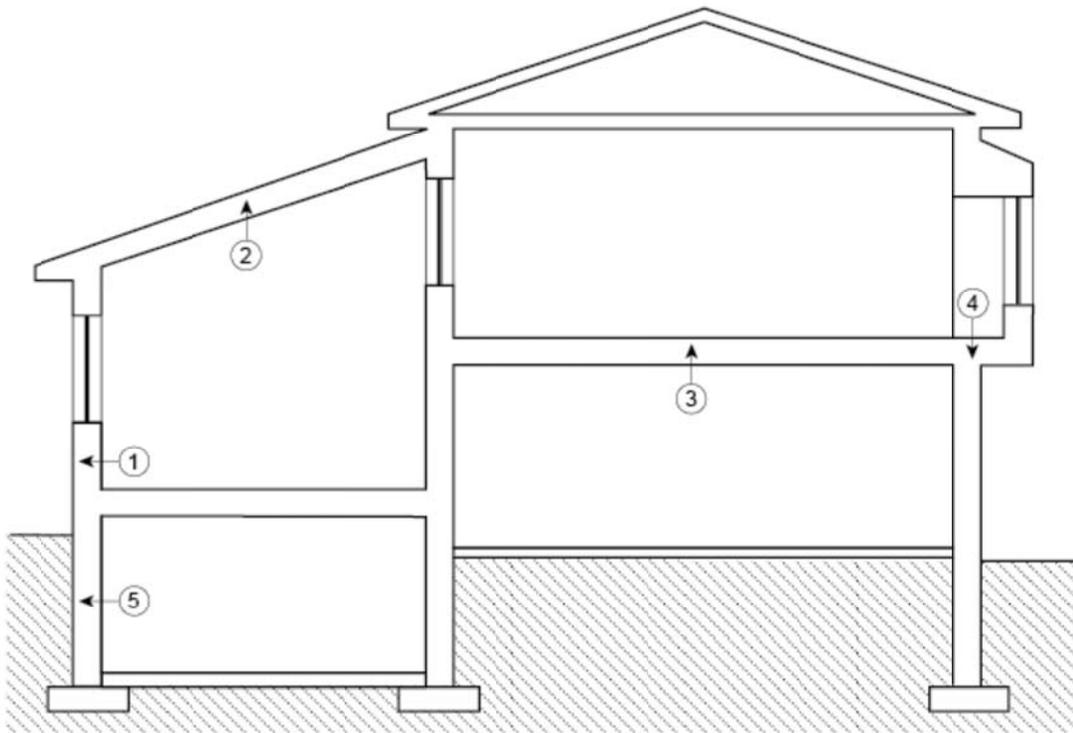
### 3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the “GacoInsulBarrier” being used in accordance with the conditions and limitations set out below.

- **Installers:** As specified by the manufacturer the product must be manufactured on site by qualified installers trained and approved by Gaco Western LLC.
- **Third-Party:** Urethane Foam Consultants (UFC) is the third-party certification organization specified by Gaco Western to conduct random follow-up field inspections of qualified installers who are trained to spray semi-flexible urethane-based foam insulation in accordance with the product's Installer's Manual. UFC may be contacted at 905-599-2459.
- The product can be installed in new or retrofit constructions. In either case, the product must be installed in open cavities in the following locations in a wood-frame construction that meets the requirements of the NBC 2010:
  - exterior walls including perimeter joists;
  - cathedral ceilings with a vented air space as required by the NBC 2010;
  - floors separating living spaces from a garage;
  - cantilever overhang floors; and
  - interior below-grade foundation walls.

The above application locations are illustrated in Figure 1.

- The building envelope in which this product is installed must conform to the requirements of the NBC 2005 for vapour barrier, air barrier and dampproofing (interior below-grade walls).
- For retrofit applications, the qualified installers must ensure that the spraying area is isolated and negatively pressurized by using an exfiltration rate of 0.3 air changes per hour for at least one (1) day. An independent toxicological assessment determined that this ventilation rate must also be in effect for one (1) day before 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 not covered in frost, oil, grease, dust or other unsuitable material. As required in Article 9.25.2.3., Installation of Thermal Insulation, of Division B of the NBC 2010, the insulation must be installed so that there is a reasonably uniform insulating value over the entire face of the insulated area.
- The interior side of the applied semi-flexible polyurethane insulation must be covered with an approved thermal barrier as per Article 9.10.17.10., Protection of Foamed Plastics, of Division B of the NBC 2005.
- The insulation should be kept away from heat-emitting devices, such as recessed light fixtures and chimneys, at the minimum distance required by building regulations and safety codes.
- The maximum in-service temperature of the insulation must not exceed 70°C.
- This product may not be used where it may come in contact with water and must not be installed after its expiry date of six (6) months from the date of manufacture.
- The components, “GacoInsulBarrier” isocyanate and resin must have their respective containers (i.e. drums) identified by the phrase “CCMC 13249-R.”
- The installation must be done in accordance with the manufacturer's instruction manual, which must be available at the job site at all times during the installation for review by the building official.



**Figure 1. Application locations in open cavities of wood-frame construction:**

- 1. above-grade wall**
- 2. cathedral ceiling (vented)**
- 3. floor above garage**
- 4. cantilever floor**
- 5. interior foundation wall**

## 4. Technical Evidence

The Report Holder has submitted technical documentation for CCMC's evaluation. Testing was conducted at laboratories recognized by CCMC. The corresponding technical evidence for this product is summarized below.

### 4.1. Material Requirements

Table 4.1 Density test results for "GacoInsulBarrier"

Property	Unit	Requirement	Results
Density	kg/m <sup>3</sup>	≥ 6.8	8.09

### 4.2. Performance Requirements

Table 4.2 Performance test results for "GacoInsulBarrier"

Property	Unit	Requirement	Result		
Thermal resistance (thickness = 50 mm)	m <sup>2</sup> ·°K/W	Report value	1.25 <sup>1</sup>		
Water vapour permeance (thickness = 50 mm)	ng/Pa·s·m <sup>2</sup>	> 1400	1641		
Water absorption by volume	%	Report value	71.3		
	28 days at 80°C and ambient RH	Min. - 15	Max. + 10	-10.01	
Dimensional changes:	28 days at 70°C and 95% RH	% volumetric	Min. - 15	Max. + 14	-9.12
	28 days at -29°C and ambient RH	Min. - 1	Max. n/a	-0.19	
Emissions (time-to-occupancy)	—	<sup>2</sup>	Pass <sup>2</sup>		

#### Notes to Table 4.2:

<sup>1</sup> At 25.4 mm thick the design thermal resistance value is 0.64 m<sup>2</sup>·K/W.

<sup>2</sup> The Volatile Organic Compound (VOC) emissions were measured with an assumed room ventilation rate of 0.3 air changes per hour as per the NBC 2010 requirements for new constructions. The determination of emissions and room concentration calculations were done by the Saskatchewan Research Council. An independent toxicologist report recommends a residential time-to-occupancy of one (1) day. Reported results from emission tests indicate that the product would be unlikely to cause major adverse health problems. 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.

## 5. Other Technical Evidence

### 5.1 Additional Performance Data Requested by the Report Holder

#### 5.1.1 Fire Requirements

Table 5.1.1 Fire test results for “GacoInsulBarrier<sup>1</sup>”

Property	Unit	Requirement	Result
Surface flame-spread <sup>2</sup>	–	Report value	42
Smoke development	–	Report value	184

Notes to Table 5.1.1:

<sup>1</sup> Three uncut specimens of 50-mm in thickness were tested in accordance with CAN/ULC-S102-03 to obtain this rating. The specimens tested were not cut as per Sentence 9.10.3.2.(2) of Division B of the NBC 2010.

<sup>2</sup> Contact Gaco Western for a flame-spread rating when required for Code-compliance.

### Report Holder

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