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**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**Section: 07 21 00—Thermal Insulation**

**REPORT HOLDER:**  
**Gaco Western, LLC**  
**1245 Chapman Drive**  
**PO Box 646**  
**Waukesha, WI 53186**  
**262-542-8072**  
[www.gacowallfoam.com](http://www.gacowallfoam.com)  
[dnelson@gaco.com](mailto:dnelson@gaco.com)

## EVALUATION SUBJECT:

**Gaco Wallfoam 183M**

## 1.0 EVALUATION SCOPE

### 1.1 Compliance with the following codes

- 2009 International Building Code® (IBC)
- 2009 International Residential Code® (IRC)
- 2009 International Energy Conservation Code® (IECC)
- Other Codes (see Supplement)

### 1.2 Property evaluated

- Surface-burning characteristics
- Physical properties
- Thermal resistance
- Attic and crawl space installation
- Air permeability
- Water Vapor Transmission

## 2.0 USES

Gaco Wallfoam 183M spray-applied polyurethane foam insulation is used as a nonstructural thermal insulating material in Type V construction under the IBC and in dwellings under the IRC. The insulation is for use in wall cavities, floor/ceiling assemblies, or attics and crawl spaces when installed in accordance with Section 4.0. Under the IRC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.4 and as a vapor retarder when installed in accordance with Section 3.5.

## 3.0 DESCRIPTION

### 3.1 Materials

Gaco Wallfoam 183M spray-applied foam insulation is semi rigid, medium-density, polyurethane foam plastic that is installed as a component of floor/ceiling and wall assemblies. The insulation is a two-component spray foam plastic with a nominal in-place density of 2.5 pcf (40 kg/m<sup>3</sup>). The insulation is produced in the field by combining a polymeric isocyanate (A component) with a polymeric resin (B component). The insulation liquid components are supplied in 55-gallon (208 L) drums and/or 250-gallon (946 L) totes and must be stored at temperatures between 50°F (10°C) and 70°F (21°C). The Gaco Wallfoam 183M has a shelf life of six months when stored in factory-sealed containers at these temperatures.

### 3.2 Surface-burning Characteristics

The insulation, at a maximum thickness of 4.5 inches (114.3 mm) and a nominal density of 2.5 pcf (8 kg/m<sup>3</sup>), has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84. Greater thicknesses are recognized as described in Sections 4.3 and 4.4.

### 3.3 Thermal Resistance, R-values

The insulation has thermal resistance (R-value<sup>1</sup>) at a mean temperature of 75°F (24°C) as shown in Table 1.

### 3.4 Air Permeability

Gaco Wallfoam 183M spray-applied polyurethane foam insulation, at a minimum thickness of 1 inch (25.4 mm), is considered air-impermeable insulation in accordance with Section R806.4 of the IRC, based on testing in accordance with ASTM E 283.

### 3.5 Vapor Retardance

Gaco Wallfoam 183M spray-applied polyurethane foam insulation has a vapor permeance of less than 1 perm (5.7x10<sup>-11</sup> kg/Pa-s-m<sup>2</sup>) at a minimum thickness of 1.2 inches (30.5 mm) and may be used where a vapor retarder is required by the applicable code.

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### 3.6 TPR2 Flexible Fireshell Ultra Intumescent Coating

TPR2 Flexible Fireshell Ultra Intumescent coating, manufactured by TPR2 Corporation, is a one-component, water-based liquid coating with specific gravity of 1.3. TPR2 Flexible Fireshell Ultra is supplied in 5-gallon (19 L) pails and/or 55-gallon (208 L) drums and has a shelf life of one year when stored in factory-sealed containers at temperatures between 45°F (7°C) and 90°F (32°C).

### 3.7 DC 315 Intumescent Coating

DC 315 Intumescent coating is a water-based coating supplied in 5-gallon (19L) pails and 55-gallon (208L) drums. The coating material has a shelf life of 24 months when stored in factory-sealed containers at temperatures between 41°F (5°C) to 95°F (35°C).

## 4.0 DESIGN AND INSTALLATION

### 4.1 General

Gaco Wallfoam 183M spray-applied foam insulation must be installed in accordance with the manufacturer's published installation instructions and this report. A copy of the manufacturer's published installation instructions must be available at all times on the jobsite during installation.

### 4.2 Application

The Gaco Wallfoam 183M insulation is spray-applied on the jobsite using a volumetric positive displacement pump as identified in the Gaco Western application manual. The insulation must be applied when the ambient temperature is greater than 23°F (-5°C). The insulation must not be used in areas that have a maximum in-service temperature greater than 200°F (93°C). The foam plastic must not be used in electrical outlet or junction boxes or in contact with water, rain or soil. The foam plastic must not be sprayed onto a substrate that is wet, or covered with frost or ice, loose scales, rust, oil, or grease. The insulation must be protected from the weather during and after application. A minimum pass thickness of ¾ inches (19 mm) is recommended with the maximum not to exceed 2 inches

(50.8 mm) per pass. Where insulation is used as an air-impermeable insulation, such as in unvented attic assemblies under IRC Section R806.4, the insulation must be installed at a minimum thickness of 1 inch (25.4 mm).

### 4.3 Thermal Barrier

**4.3.1 Application with a Prescriptive Thermal Barrier:** Gaco Wallfoam 183M spray foam insulation at a maximum thickness of 4.5 inches (114.3 mm) must be separated from the interior of the building by an approved thermal barrier of 1/2 inch thick (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4, as applicable, except where insulation is in an attic or crawl space as described in Section 4.4

**4.3.2 Application without a Prescriptive Thermal Barrier:** Gaco Wallfoam 183M spray foam insulation may be spray-applied to the underside of the roof sheathing and/or rafters, as described in this section. The thickness of the foam plastic applied to the underside of the roof sheathing must not exceed 9 ½ inches (241 mm). The thickness of the spray foam insulation applied to vertical wall surfaces must not exceed 5 ½ inches (140 mm). The foam plastic must be covered on all surfaces with DC 315 coating at a total minimum wet film thickness of 28 mils, applied in two coats. The first coat is a primer coat of 6 wet mils of DC 315, followed by a second coat of 22 wet mils of DC 315. The coating must be applied over the Gaco Wallfoam 183M spray foam insulation in accordance with the coating manufacturer's instructions and this report. Surfaces to be coated must be dry, clean, and free of dirt, loose debris and other substances that could interfere with adhesion of the coating. The coating is applied with low-pressure airless spray equipment.

### 4.4 Attics and Crawl Spaces

**4.4.1 Application with a Prescriptive Ignition Barrier:** When Gaco Wallfoam 183M spray foam insulation is installed within attics and crawl spaces where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable

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code, and must be installed in a manner so the foam plastic insulation is not exposed. Gaco Wallfoam 183M spray-applied foam insulation as described in this section may be installed in unvented attics in accordance with IRC Section R806.4.

#### **4.4.2 Application without a Prescriptive Ignition Barrier**

**4.4.2.1 General:** Gaco Wallfoam 183M spray-applied foam insulation may be installed in attics and crawl spaces, without a prescriptive ignition barrier as described in IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4, in accordance with Section 4.4.2.2, 4.4.2.3, or 4.4.2.4, when all of the following conditions apply:

- a. Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
- b. There are no interconnected attic or crawl space areas.
- c. Air in the attic or crawl space is not circulated to other parts of the building.
- d. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.
- e. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with Section R806.4 of the IRC.
- f. Combustion air is provided in accordance with IMC (International Mechanical Code) Section 701.

**4.4.2.2 TPR2 Flexible Fireshell Ultra Intumescent Coating:** In attics, Gaco Wallfoam 183M foam insulation may be spray-applied to the underside of the roof sheathing and/or rafters; and in crawl spaces, the insulation may be spray-applied to the underside of wood floors as described in this section. The thickness of the foam plastic applied to the underside of the top of the space must not exceed 11½ inches (292 mm) and the vertical surfaces must not exceed 9½ inches (241 mm). The foam plastic surface must be covered with a minimum nominal thickness of 16 wet mils (0.41 mm) of the TPR2 Flexible Fireshell Ultra intumescent coating described in Section 3.6. The intumescent coating must be spray-applied over the insulation in accordance with the coating manufacturer's instructions and this report.

**4.4.2.3 Application without an Intumescent Coating:** In attics, Gaco Wallfoam 183M foam insulation may be

spray-applied to the underside of the roof sheathing and/or rafters; and in crawl spaces, the insulation may be spray-applied to the underside of wood floors as described in this section. The thickness of the foam plastic applied to the underside of the top of the space must not exceed 9½ inches (241 mm) and the vertical surfaces must not exceed 7 ½ inches (191 mm). The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 and R316.5.4 may be omitted. The foam plastic insulation described in this Section may be installed in unvented conditioned attics in accordance with IRC Section R806.4 when foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

**4.4.2.4 Use on Attic Floors:** Gaco Wallfoam 183M spray-applied foam insulation may be installed exposed (no coating) at a maximum thickness of 9 1/2 inches (241 mm) between and over the joists in attic floors. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier required by IBC Section 2603.4 and IRC Section R316.5.3 may be omitted.

## **5.0 CONDITIONS OF USE**

Gaco Wallfoam 183M spray foam insulation described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

**5.1** The products must be installed in accordance with the manufacturer's published installations instructions, this evaluation report and the applicable code. If there are any conflicts between the manufacturer's published installation instructions and this report; this report governs.

**5.2** The insulation must be separated from the interior of the building by an approved 15-minute thermal barrier, except when installation is as described in Sections 4.4.1 through 4.4.2.4.

**5.3** The insulation must not exceed the thicknesses noted in Sections 3.2, 4.2, 4.3, and 4.4.

**5.4** The insulation must be protected from exposure to weather during and after application.



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**5.5** The insulation must be applied by contractors certified by Gaco Western, LLC.

**5.6** Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with IRC Section R318.4 or IBC Section 2603.8, as applicable.

**5.7** Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 102.1.1 and 102.2.11, as applicable.

**5.8** The insulation is produced in Waukesha, Wisconsin, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-690).

## 6.0 EVIDENCE SUBMITTED

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated October 2010, including reports of tests in accordance with Appendix X.

**6.2** Reports of air leakage testing in accordance with ASTM E283.

## 7.0 IDENTIFICATION

Components of the sprayfoam insulation are identified with the manufacturer's name Gaco Western, LLC, address and telephone number: the product name (Gaco Wallfoam 183M); use instructions; the flame spread and smoke-development indices; the lot number; the evaluation report number (ER-234); and the name of the inspection agency (Intertek Testing Services NA, Inc.).



**IAPMO #0234**

A handwritten signature in black ink, appearing to read 'Amir H. ...'.

Director of Evaluation Services

Each pail/drum of the TPR2 Flexible Fireshell Ultra intumescent coating is labeled with the manufacturer's name (TPR2 Corporation), the product name, and use instructions



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**Table 1 – THERMAL RESISTANCE (R-Values<sup>1</sup>)**

THICKNESSES (inches)	R-VALUE (°f.FT <sup>2</sup> .H/Btu)
1.00	6.4
3.50	23.3
4.00	27.0
5.50	37.0
6.00	40.0
7.25	48.0
8.00	53.0
9.25	62.0
9.50	63.0
10.00	67.0
11.25	75.0

For SI: 1 inch = 25.4 mm; 1 °F.ft<sup>2</sup>.h/Btu = 0.176 110°K.m<sup>2</sup>/W

<sup>1</sup>R-Values are calculated based on tested K-values at 1 inch and at 3.5 inch thicknesses.



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## SUPPLEMENT

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Gaco Western, LLC  
1245 Chapman Drive  
PO Box 646  
Waukesha, WI 53186  
262-542-8072  
[www.gacowallfoam.com](http://www.gacowallfoam.com)  
[dnelson@gaco.com](mailto:dnelson@gaco.com)

### EVALUATION SUBJECT:

#### GACO WALLFOAM 183M

This supplement is issued to indicate that the Gaco Wallfoam 183M spray-applied polyurethane foam insulation, described in the master report comply with the codes listed in Section 1.1 of this Supplement when designed and installed in accordance with the master evaluation report and the amendments of the report as shown below.

### 1.0 EVALUATION SCOPE

#### 1.1 Compliance with the following codes

- 2006 International Building Code® (2006 IBC)
- 2006 International Residential Code® (2006 IRC)
- 2006 International Energy Conservation Code® (IECC)
- 2003 International Building Code® (IBC)
- 2003 International Residential Code® (IRC)
- 2003 International Energy Conservation Code® (IECC)

### 2.0 Uses

The products comply with the above mentioned codes as described in Sections 2.0 through 7.0 of the master report as noted below:

- **Application with a Prescriptive Thermal Barrier:** See Section 4.3.1, except the approved thermal barrier must be installed in accordance with section R314.4 of the 2006 IRC. Application with a Prescriptive Ignition Barrier: See Section 4.4.1, except attics must be vented in accordance with Section 1203.2 of the 2006 IBC and crawl space ventilation must be in accordance with IBC Section 1203.3 of the 2006 or IRC Section R408, as applicable. Additionally, an ignition barrier must be installed in accordance with Sections R314.5.3 or R314.5.4 of the 2006 IRC, as applicable.
- **Protection Against Termites:** See Section 5.6, except use of the insulation in areas where the probability of termite infestation is “very heavy” must be in accordance with Section R320.5 of the 2006 IRC.
- **Jobsite Certification and Labeling:** See Section 5.7, except jobsite certification and labeling must comply with Sections 102.1.1 and 102.1.11, as applicable, of the 2006 IECC