



Report Number: 0233  
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**DIVISION: 07- THERMAL AND MOISTURE PROTECTION**  
**Section: 07 21 00 Thermal Insulation**

**REPORT HOLDER:**

**Gaco Western, LLC**  
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**EVALUATION SUBJECT:**

**GacoFireStop 5500**

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

**1.2 Evaluated in accordance with**

- ICC-ES AC377 Acceptance Criteria for Spray-Applied Foam Plastic Insulation (approved October 2010)

**1.3 Property evaluated**

- Surface-burning characteristics Physical properties
- Thermal Resistance
- Attic and crawl space installation
- Air permeability

**2.0 USES**

The insulation material 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 product may be used as air-impermeable material when installed in accordance with Section 3.4

The products comply with the above-mentioned codes as described in this report. This report is based on the 2009 ICC Codes listed above except 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 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.
- Application without a Prescriptive Ignition Barrier: See Section 4.4.2, except attics must be vented in accordance with Section 1203.2 of the 2006 or Section R806 of the IRC, and crawl space ventilation must be in accordance with Section 1203.3 of 2006 IBC or IRC Section R408, 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

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### 3.0 DESCRIPTION

#### 3.1 Materials

GacoFireStop 5500 spray-applied foam insulation is semi-rigid, low-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 0.55 pcf (9 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 must be stored at temperatures between 50°F (10°C) and 90°F (32°C). GacoFireStop 5500 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 4.0 inches (101.6 mm) and a nominal density of 0.55 pcf (9 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. Thicknesses of up to 11¼ inches (286 mm) for wall cavities and 16 inches (406 mm) for ceiling cavities are recognized based on room corner fire testing in accordance with NFPA 286, when covered with a minimum ½ inch thick (12.7 mm) gypsum board or equivalent thermal barrier complying with and installed in accordance with the applicable code.

#### 3.3 Thermal Resistance, R-values

The foam insulation has a thermal resistance (R-value) at a mean temperature of 75°F (24°C) as shown in Table 1, based on testing in accordance with ASTM C 518.

#### 3.4 Air Permeability

GacoFireStop 5500 spray-applied polyurethane foam insulation, at a minimum thickness of 3.5 inches (89 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 DC 315 Intumescent Coating

DC 315 intumescent coating is a water-based coating manufactured by IFTI, Paint to Protect, and is 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

GacoFireStop 5500 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 GacoFireStop 5500 insulation is spray-applied on the jobsite using a volumetric positive displacement pumps as identified in the Gaco Western application manual. The insulation must be applied when the ambient temperature is greater than 32°F (0°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 inside electrical outlet or junction boxes. 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. The insulation may be applied to the maximum thickness in a single 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 3.5 inches (89 mm).

#### 4.3 Thermal Barrier

**4.3.1 Application with a Prescriptive Thermal Barrier:** GacoFireStop 5500 spray foam insulation separated from the interior of the building by an approved thermal barrier of ½ inch-thick (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4 except where insulation is in an attic or crawl space as described in Section 4.4.

Report Number: 0233  
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**4.3.2 Application without a Prescriptive Thermal Barrier:** GacoFireStop 5500 spray foam insulation may be spray-applied to the underside of the roof sheathing and/or rafters, floor members and walls as described in this section. The thickness of the foam plastic applied to the underside of the roof sheathing and rafters, or floors must not exceed 11½ inches (292 mm). The thickness of the spray foam insulation applied to vertical wall surfaces and between and over the attic joists must not exceed 7½ inches (190 mm).

The exposed surfaces of the foam plastic must be covered with DC 315 coating at a total minimum film thickness of 22 wet mils. The coating must be applied over the GacoFireStop 5500 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 GacoFireStop 5500 spray foam insulation is installed within attics or 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 code. GacoFireStop 5500 spray-applied foam insulation as described in this section may be installed in unvented attics in accordance with IRC Section R806.4 and may be shaved or trimmed to any degree or left unshaven or untrimmed.

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

**4.4.2.1 General:** Gaco FireStop 5500 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 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.

GacoFireStop 5500 applied as described above, can be shaven or trimmed to stud or rafter depth, or left fully untrimmed or unshaven.

#### 4.4.2.2 Application without an Intumescent Coating:

The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 and R316.5.4 may be omitted for the following applications. GacoFireStop 5500 can be shaven or trimmed to stud or rafter depth, or left fully untrimmed or unshaven. The insulation must be separated from the interior of the building by an approved thermal barrier.

In attics, GacoFireStop 5500 foam insulation may be spray-applied to the underside of the roof sheathing and rafters, between and over the joists on attic floors, and to walls. The thickness of the foam plastic applied to roof sheathing and rafters surfaces must not exceed 11¼ inches (286 mm) and applied to walls (vertical surfaces) and between and over the joists in attic floors must not exceed 9¼ inches (235 mm). 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 3.5 inches (88.9 mm) or greater.

In crawlspaces, GacoFireStop 5500 foam insulation may be spray-applied to the underside of floors above crawlspaces and walls. The thickness of the foam plastic applied to in floors over crawlspaces must not exceed 11¼ inches (286 mm) and applied to walls (vertical surfaces) must not exceed 9¼ inches (235 mm).



Report Number: 0233  
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## 5.0 CONDITIONS OF USE

GacoFireStop 5500 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 manufacturers 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 a 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.

**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.

**5.7** 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 Feb 2011, including reports of tests in accordance with Appendix X.

**6.2** Reports of air leakage testing in accordance with ASTM E 283.

## 7.0 IDENTIFICATION

Components of the spray foam insulation are identified with the manufacturer's name Gaco Western, LLC, address and telephone number; the product name (GacoFireStop 5500) use instructions; the flame-spread and smoke-developed indices; the lot number; the evaluation report number (0233); and the name of the inspection agency (Intertek Testing Services NA, Inc.).



**IAPMO #0233**

A handwritten signature in black ink, appearing to read "Amir" followed by a flourish.

Director of Evaluation Services



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TABLE 1-THERMAL RESISTANCE (R-VALUES)

Thickness (inches)	R-value ( $^{\circ}\text{f ft}^2 \text{ hr/btu}$ )
1.00	3.7
3.50	13
5.50	20
7.25	27
8.00	30
9.25	34
10.00	37
11.00	41
11.25	42
12.00	45
13.00	48
14.00	52
15.00	56
16.00	59

For SI: 1 inch = 25.4 mm; 1 0F.ftz.h/Btu = 0.176 110°K.m2/W.

'R-values are calculated based on tested K-values at 1- and 3.5-inch thicknesses all other thickness' are calculated.