

# ICC-ES Evaluation Report

**ESR-2669**

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**DIVISION: 07—THERMAL AND MOISTURE PROTECTION**  
**Section: 07210—Building Insulation****REPORT HOLDER:****CERTAINTEED CORPORATION**  
750 EAST SWEDES FORD ROAD  
VALLEY FORGE, PENNSYLVANIA 19482  
(610) 341-7000  
[www.certainteed.com](http://www.certainteed.com)**EVALUATION SUBJECT:****CERTASPRAY CLOSED CELL SPRAY FOAM INSULATION****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 2006 *International Energy Conservation Code*® (IECC)
- Other Codes (see Section 8.0)

**Properties evaluated:**

- Surface-burning characteristics
- Thermal resistance (*R*-value)
- Attic and crawl space installation
- Physical properties
- Air permeability
- Vapor retarder

**2.0 USES**

CertaSpray Closed-Cell Spray Foam Insulation is used as a nonstructural thermal insulating material in buildings of Type V-B construction under the IBC, and in structures constructed in accordance with the IRC. The insulation is for use in wall cavities, floor assemblies, ceiling assemblies and attics and crawl spaces when installed in accordance with Section 4.0.

**3.0 DESCRIPTION****3.1 General:**

CertaSpray Closed-Cell Spray Foam Insulation is a two-component, closed-cell, spray-applied, semirigid, medium-density, polyurethane foam plastic insulation. The applied insulation has a nominal density of 2.0 pcf (32 kg/m<sup>3</sup>). The insulation is produced by combining a polymeric isocyanate Part A (CertaSpray A) with a resin-based Part

B (CertaSpray BCC) on site, during the spray application. The component products have a shelf life of six months when stored in factory-sealed containers at temperatures between 55°F and 80°F (13°C and 27°C).

**3.2 Surface-burning characteristics:**

The insulation, at a maximum thickness of 6 inches (152 mm) and a nominal density of 2.0 pcf (32 kg/m<sup>3</sup>), has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84.

**3.3 Thermal Resistance (*R*-values):**

The insulation has thermal resistance *R*-values, at a mean temperature of 75°F (24°C), as shown in Table 1.

**3.4 Vapor Retarder:**

The CertaSpray Closed-Cell Spray Foam Insulation at a thickness of 1 inch (25 mm) is a vapor retarder as defined in IRC Section R202 and IECC Section 202. When installed at a thickness less than 1 inch (25 mm), a vapor retarder must be provided when required by IRC Section R318 or IECC Sections 402.5 and 502.5.

**3.5 Air Permeability:**

The CertaSpray Closed-Cell Spray Foam Insulation is considered air-impermeable, based on testing in accordance with ASTM E 283, when installed at a thickness of 1 inch (25 mm) or greater.

**3.6 FireFree 88 Intumescent Coating:**

FireFree 88 is a water-based intumescent fire-retardant coating manufactured by FireFree Coatings Inc. FireFree 88 is supplied in 5-gallon (19 L) pails and has a shelf life of one year when stored in a factory-sealed container at temperatures between 35°F and 85°F (2°C and 29°C).

**4.0 INSTALLATION****4.1 General:**

CertaSpray Closed-Cell Spray Foam Insulation must be installed in accordance with the manufacturer's published installation instructions, the applicable code 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 insulation is spray-applied on the jobsite using a volumetric positive displacement pump to combine the Part A and Part B components at a one-to-one ratio, as specified in the manufacturer's published installation instructions. The spray foam insulation may be applied at a

maximum of 2 inches (51 mm) per pass to a maximum thickness of 6 inches (152 mm). CertaSpray Closed-Cell Spray Foam Insulation must not be applied in areas that are exposed to a maximum ambient temperature greater than 180°F (82°C). The substrates to which the insulation is applied must be clean, dry and free of frost, ice, loose debris, or contaminants that will interfere with adhesion of the spray foam insulation. The spray foam insulation must not be applied in electrical outlet or junction boxes or in direct contact with water or soil. The spray-applied foam insulation must be protected from the weather during and after application.

#### 4.3 Thermal Barrier:

CertaSpray Closed-Cell Spray Foam Insulation 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 R314.4, as applicable, except when installation is in attics or crawl spaces as described in Section 4.4.

#### 4.4 Attics and Crawl Spaces:

##### 4.4.1 Application with a Prescriptive Ignition Barrier:

When CertaSpray Closed-Cell 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 R314.5.3 or R314.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code, and must be installed in a manner so that the foam plastic insulation is not exposed. The insulation as described in this section may be installed in unvented conditioned attics in accordance with IRC Section R806.4 when the foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

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

Where CertaSpray Closed-Cell Spray Foam Insulation is installed in accordance with Sections 4.4.2.1 and 4.4.2.2, the following conditions apply:

- Entry to the attic or crawl space is only to service utilities and no storage is permitted.
- There are no interconnected crawl space or attic areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Ventilation of the attic or crawl space is provided in accordance with the applicable code, except when insulation is permitted in unvented conditioned attics in accordance with IRC Section R806.4.

**4.4.2.1 Application without Intumescent Coating:** In attics, CertaSpray Closed-Cell Spray Foam Insulation may be spray-applied to the underside of roof sheathing, roof rafters and walls; and in crawl spaces, CertaSpray Closed-Cell Spray Foam Insulation may be spray-applied to the underside of wood floors and walls as described in this section. The thickness of the foam plastic applied to the vertical surfaces or the underside of the wood floor or roof sheathing must not exceed 6 inches (152.4 mm). The ignition barrier in accordance with IBC Section 2603.4.1.6 or IRC Section R314.5.3 or R314.5.4 may be omitted. CertaSpray Closed-Cell Spray Foam Insulation, as described in this section, may be installed in unvented conditioned attics in accordance with IRC Section R806.4 when the foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

**4.4.2.2 Application with FireFree Intumescent Coating:** In attics, CertaSpray Closed-Cell Spray Foam Insulation may be spray-applied to the underside of roof sheathing, roof rafters and walls; and in crawl spaces, CertaSpray Closed-Cell insulation may be spray-applied to the underside of wood floors and walls as described in this section. The thickness of the foam plastic applied to the vertical surfaces or the underside of the top of the space must not exceed 6 inches (152.4 mm). The foam plastic must be covered with a minimum nominally 14-mil (0.36 mm) wet film thickness of the FireFree 88 intumescent coating described in Section 3.6. The FireFree 88 intumescent coating must be applied over the CertaSpray Closed-Cell 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 any other substances that could interfere with adhesion of the coating. The FireFree 88 coating is applied with a medium-size nap roller, soft brush or conventional airless spray equipment at a rate of 1 gallon per 100 square feet (0.41 liter per square meter) to obtain a recommended minimum dry film thickness of 10 mils (0.25 mm) [14 mils wet (0.36 mm)]. The coating must be applied when ambient and substrate temperatures will be above 40°F (5°C) for at least two hours after application. CertaSpray Closed-Cell Spray Foam Insulation, as described in this section, may be installed in unvented conditioned attics in accordance with IRC Section R806.4 when the foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

**4.4.3 Use on Attic Floors:** CertaSpray Closed-Cell Spray Foam Insulation may be installed exposed at a maximum thickness of 6 inches (152.4 mm) between joists in attic floors. The CertaSpray Closed-Cell Spray Foam Insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier in accordance with IBC Section 2603.4.1.6 or IRC Section R314.5.3 may be omitted.

#### 5.0 CONDITIONS OF USE

The CertaSpray Closed-Cell 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** CertaSpray Closed-Cell Spray Foam Insulation coating must be installed in accordance with the manufacturer's published installation 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 has been evaluated only for use in Type V-B construction under the IBC and dwellings under the IRC.
- 5.3** The thickness and density of the insulation must not exceed what is stated in Sections 3.2 and 4.4.
- 5.4** CertaSpray Closed-Cell Spray Foam Insulation must be applied by contractors certified by CertainTeed Corporation.
- 5.5** CertaSpray Closed-Cell Spray Foam Insulation must be separated from the building interior as described in Section 4.3, except when installation is in attics and crawl spaces as described in Section 4.4.
- 5.6** 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 102.1.1.1, as applicable.

- 5.7 In areas where the probability of termite infestation is “very heavy” as determined in accordance with IBC Figure 2603.8 or IRC Figure R301.2 (6), the foam plastic must be installed in accordance with IBC Section 2603.8 or IRC Section R320.5.
- 5.8 The Part A component is produced in Geismar, Louisiana, and St. Rose, Louisiana, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-657).
- 5.9 The Part B component is produced in Mississauga, Ontario, Canada, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-657).

## 6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with Appendix B of the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated May 2008.
- 6.2 Reports of air leakage tests in accordance with ASTM E 283.
- 6.3 Reports on comparative fire testing of spray-applied foam plastic for installation without ignition barriers in attics and crawl spaces.
- 6.4 Engineering fire risk analysis of comparative crawl space fire testing.

## 7.0 IDENTIFICATION

The Part A and Part B components for CertaSpray Closed-Cell Spray Foam Insulation are packaged in 55-gallon (208 L) drums bearing labels with the report holder's name (CertainTeed Corporation) and address; the date of manufacture and the lot number; the product trade name (CertaSpray A or CertaSpray BCC); the installation instructions; the density; the flame-spread and smoke-developed indices; the name of the inspection agency (Intertek Testing Services NA, Inc.); and the evaluation report number (ESR-2669).

Each pail of FireFree 88 intumescent coating is labeled with the manufacturer's name (FIREFREE Coatings Inc.) and address, the product trade name (FireFree 88) and either the date of manufacture or the expiration date.

## 8.0 OTHER CODES

### 8.1 Scope:

In addition to the codes referenced in Section 1.0, the products recognized in this report were evaluated for compliance with the requirements of the following codes:

- 2003 *International Building Code*® (2003 IBC)
- 2003 *International Residential Code*® (2003 IRC)
- 2003 *International Energy Conservation Code*® (2003 IECC)
- BOCA® *National Building Code/1999* (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

### 8.2 Uses:

CertainTeed CertaSpray Closed-Cell Spray Foam Insulation is used as a nonstructural thermal insulating material in buildings of Type V-B construction under the 2003 IBC, and in structures constructed in accordance with the 2003 IRC; and in Type 5-B construction under the BNBC, Type VI construction under the SBC and Type V-N

construction under the UBC. The insulation is for use in wall cavities, floor assemblies, ceiling assemblies and attics and crawl spaces, when installed in accordance with Section 8.4.

### 8.3 Description:

**8.3.1 General:** See Section 3.0.

### 8.3.2 Surface-burning Characteristics:

**8.3.2.1 2003 IBC, 2003 IRC, BNBC and SBC:** See Section 3.2.

**8.3.2.2 UBC:** The insulation, at a maximum thickness of 6 inches (152.4 mm) and a nominal density of 2 pcf (32 kg/m<sup>3</sup>), has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with UBC Standard 8-1.

**8.3.3 Thermal Resistance (R-values):** See Section 3.3.

**8.3.4 Vapor Retarder:** When required by the applicable code, a vapor retarder system, which may include the foam plastic insulation, must be installed.

**8.3.5 FireFree 88 Intumescent Coating:** See Section 3.6.

### 8.4 Installation:

**8.4.1 General:** See Section 4.1.

**8.4.2 Application:** See Section 4.2.

**8.4.3 Thermal Barrier:** CertaSpray Closed-Cell Spray Foam Insulation at a maximum thickness of 6 inches (152.4 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, 2003 IBC Section 2603.4, 2003 IRC Section R314.1.2, BNBC Section 2603.4, SBC Section 2603.5 or UBC Section 2602.4, as applicable, except when installation is in attics or crawl spaces as described in Section 8.4.4.

### 8.4.4 Attics and Crawl Spaces:

**8.4.4.1 Application with a Prescriptive Ignition Barrier:** When CertaSpray Closed-Cell 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 2003 IBC Section 2603.4.1.6, 2003 IRC Section R314.2.3, BNBC Section 2603.4.1.4, SBC Section 2603.5.1.6 or UBC Section 2602.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code, and must be installed in a manner so that the foam plastic insulation is not exposed. Attics and crawl spaces must be ventilated in accordance with the applicable code.

**8.4.4.2 Application without a Prescriptive Ignition Barrier:** See Section 4.4.2.

**8.4.4.2.1 Application without Intumescent Coating:** In attics, CertaSpray Closed-Cell Spray Foam Insulation may be spray-applied to the underside of roof sheathing, roof rafters and walls; and in crawl spaces, CertaSpray Closed-Cell Spray Foam Insulation may be spray-applied to the underside of wood floors and walls as described in this section. The thickness of the foam plastic applied to the vertical surfaces or the underside of the top of the space must not exceed 6 inches (152.4 mm). The ignition barrier in accordance with 2003 IBC Section 2603.4.1.6, 2003 IRC

Section R314.2.3, BNBC Section 2603.4.1.4, SBC Section 2603.5.1.6, and UBC Section 2602.4 may be omitted. Attics and crawl spaces must be ventilated in accordance with the applicable code.

**8.4.4.2.2 Application with Intumescent Coating:** See Section 4.4.2.2.

**8.4.4.3 Use on Attic Floors:** CertaSpray Closed-Cell Spray Foam Insulation may be installed exposed at a maximum thickness of 6 inches (152.4 mm) between joists in attic floors. The CertaSpray Closed-Cell Spray Foam Insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier in accordance with 2003 IBC Section 2603.4.1.6, 2003 IRC Section R314.2.3, BNBC Section 2603.4.1.4, SBC Section 2603.5.1.6 and UBC Section 2602.4 may be omitted.

**8.5 Conditions of Use:**

The CertaSpray Closed-Cell Spray Foam Insulation described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 8.1 of this report, subject to the following conditions:

**8.5.1** See Section 5.1.

**8.5.2** CertaSpray Closed-Cell Spray Foam Insulation has been evaluated only for use in Type V-B construction under the 2003 IBC, dwellings under

the 2003 IRC, Type 5-B construction under the BNBC, Type VI construction under the SBC and Type V-N construction under the UBC.

**8.5.3** See Section 5.3.

**8.5.4** See Section 5.4.

**8.5.5** CertaSpray Closed-Cell Spray Foam Insulation must be separated from the building interior as described in Section 8.4.3.

**8.5.6** In areas where the probability of termite infestation is "very heavy" as determined in accordance with 2003 IRC Figure R301.2 (6) or SBC Figure 2304.1.4, the foam plastic must be installed in accordance with 2003 IRC Section R320.4 or SBC Section 2603.3, respectively.

**8.5.7** See Section 5.8.

**8.5.8** See Section 5.9.

**8.6 Evidence Submitted:**

See Section 6.0.

**8.7 Identification:**

See Section 7.0.

**TABLE 1—INSULATION THERMAL RESISTANCE (R-VALUES)**

THICKNESS (inches)	R-VALUE (h-ft <sup>2</sup> -°F)/Btu
<b>ASTM C 518 TESTED VALUES</b>	
1	5.8
4	25.6
6	38.7
<b>CALCULATED R-VALUES</b>	
1	5.8
1½	8.7
2	11.6
2½	16.0
3	19.2
3½	22.4
4	25.6
4½	28.8
5	32.3
5½	35.5
6	38.7
Tested in accordance with ASTM C 518 and/or C 177 at 75°F (24°C) mean temperature	

For **SI**: 1 h-ft<sup>2</sup>-°F/BTU = 0.176 K-m<sup>2</sup>/W, 1 inch = 25.4 mm.