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ESR-2669

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Valid: 09/14 to 09/15

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

CERTAINTED CORPORATION

**750 EAST SWEDES FORD ROAD
VALLEY FORGE, PENNSYLVANIA 19482**

EVALUATION SUBJECT:

CERTASPRAY CLOSED-CELL SPRAY FOAM INSULATION



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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION****Section: 07 21 00—Building Insulation****REPORT HOLDER:****CERTAINTEED CORPORATION**
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VALLEY FORGE, PENNSYLVANIA 19482
(610) 341-7000
www.certainteed.com**EVALUATION SUBJECT:****CERTASPRAY CLOSED-CELL SPRAY FOAM INSULATION****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2012 and 2009 *International Building Code*® (IBC)
- 2012 and 2009 *International Residential Code*® (IRC)
- 2012 and 2009 *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
- Water vapor transmission
- Exterior walls in Type I through IV construction

2.0 USES

CertaSpray Closed-Cell Spray Foam Insulation is used as a nonstructural thermal insulating material in Types I, II, III, IV and V construction under the IBC when installed in accordance with Section 4.5, and dwellings under the IRC. The insulation is for use in wall cavities, floor assemblies, ceiling assemblies and, when installed in accordance with Section 4.4, in attics and crawl spaces. Under the IRC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.5.

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. 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, has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84. 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*-values, at a mean temperature of 75°F (24°C), as shown in Table 1.

3.4 Vapor Permeance:

The CertaSpray Closed-Cell Spray Foam Insulation has a vapor permeance of less than 1 perm (5.7×10^{-11} kg/Pa-s-m²) when applied at a minimum thickness of 1 inch (25 mm) and may be used where a Class II vapor retarder is required by the applicable code.

3.5 Air Permeability:

The CertaSpray Closed-Cell Spray Foam Insulation is considered air-impermeable, based on testing in accordance with ASTM E283, when installed at a thickness of 1 inch (25 mm) or greater.

3.6 Intumescent Coatings:

3.6.1 Flame Seal TB: Flame Seal TB is a two-component, four-to-one-by-volume, liquid-applied, water-based polymer intumescent coating, manufactured by Flame Seal Products. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of six months when stored in a factory-sealed container at temperatures between 40°F and 90°F (4°C and 32°C).

3.6.2 Fireshell® F10E Intumescent Coating: Fireshell® F10E is a one-component water-based intumescent coating manufactured by TPR2 Corporation. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of one year when stored in factory-sealed containers at temperatures of 45°F (7°C) and 95°F (35°C).

4.0 INSTALLATION**4.1 General:**

CertaSpray Closed-Cell Spray Foam Insulation must be installed in accordance with the manufacturer's published

*Corrected October 2014

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 the maximum thickness specified in Sections 4.3 and 4.4. 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:

4.3.1 Application with a Prescriptive 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 R316.4, as applicable, except when installation is in attics or crawl spaces as described in Section 4.4 or when installation is in accordance with Section 4.3.2. CertaSpray Closed-Cell Spray Foam Insulation is not limited in thickness when the insulation is separated from the interior of the building by an approved thermal barrier.

4.3.2 Application without a Prescriptive Thermal Barrier:

4.3.2.1 Application with Fireshell® F10E Intumescent Coating: The prescriptive 15-minute thermal barrier may be omitted when installation is in accordance with this section. The insulation and intumescent coating may be spray-applied to the interior facing of walls, the underside of the roof sheathing or roof rafter, and in crawl spaces, and may be left exposed as an interior finish without a prescribed 15-minute thermal barrier or ignition barrier. The thickness of the foam plastic applied to the underside of roof sheathing must not exceed 9 1/2 inches (241 mm). The thickness of the spray foam insulation applied to vertical wall surfaces must not exceed 5 1/2 inches (140 mm). The foam plastic must be covered on all surfaces with Fireshell® F10E intumescent coating applied over the foam at a minimum application rate of 1.14 gallons per 100 square feet and at a minimum wet film thickness of 17 mils (11 mils dry). The 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 other substances that could interfere with adhesion of the coating. The coating is applied in one coat with airless spray equipment.

4.3.2.2 Application with Flame Seal TB Intumescent Coating: The prescriptive 15-minute thermal barrier may be omitted when installation is in accordance with this section. The insulation and intumescent coating may be spray-applied to the interior facing of walls, the underside

of the roof sheathing or roof rafter, and in crawl spaces, and may be left exposed as an interior finish without a prescribed 15-minute thermal barrier or ignition barrier. The thickness of the foam plastic applied to the underside of roof sheathing must not exceed 12 inches (305 mm). The thickness of the spray foam insulation applied to vertical wall surfaces must not exceed 12 inches (305 mm). The foam plastic must be covered on all surfaces with Flame Seal TB intumescent coating applied over the foam at a minimum application rate of 1.6 gallons per 100 square feet and at a minimum wet film thickness of 25 mils (18 mils dry). The 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 other substances that could interfere with adhesion of the coating. The coating is applied in one coat with airless spray equipment.

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 R316.5.3 or R316.5.4, as applicable, except when installation is in accordance with Section 4.4.2. 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. CertaSpray Closed-Cell Spray Foam Insulation may be installed in unvented attics in accordance with 2012 IRC Section R806.5 (2009 IRC Section R806.4).

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.
- Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.
- Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when air-impermeable insulation is permitted in unvented conditioned attics in accordance with IRC Section R806.4.
- Combustion air is provided in accordance with IMC (International Mechanical Code®) Section 701.

4.4.2.1 Application with Flame Seal TB 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, the 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 12 inches (304 mm). The foam plastic must be covered with Flame Seal TB, applied in accordance with the coating manufacturer's instructions, at an application rate of 0.64 gallon per 100 square feet, resulting in a 7-mil dry film thickness.

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 Flame Seal TB coating is applied by airless sprayer at ambient temperatures between 50°F and 115°F (10°C and 46°C) and relative humidity of less than 70 percent.

The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 may be omitted. The foam plastic insulation described in this section may be installed in unvented attics in accordance with 2012 IRC Section R806.5 (2009 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 without an 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, the 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 12 inches (304 mm).

The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 may be omitted. The foam plastic insulation described in this section may be installed in unvented attics in accordance with 2012 IRC Section R806.5 (2009 IRC Section R806.4) when the foam plastic is applied at a thickness of 1 inch (25.4 mm) or greater.

4.4.2.3 Use on Attic Floors: CertaSpray Closed-Cell Spray Foam Insulation may be installed exposed (no coating,) or with one of the intumescent coatings described in Section 4.4.2.1 or 4.4.2.2, at a maximum thickness of 12 inches (304 mm) between joists in attic spaces. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier required by IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4 may be omitted.

4.5 Exterior Walls in Types I, II, III and IV Construction:

When used on exterior walls of Type I, II, III and IV construction, CertaSpray Closed-Cell Spray Foam Insulation must comply with IBC Section 2603.5 and must be installed at a maximum thickness of 3 inches (76 mm). The potential heat of the CertaSpray Closed-Cell Spray Foam Insulation is 1930 Btu/ft² (22.0 MJ/m²) per inch of thickness when tested in accordance with NFPA 259. Wall assemblies complying with this section must be as described in Table 2.

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 thickness and density of the insulation must not exceed what is stated in Sections 3.2, 4.3, 4.4 and 4.5.

- 5.3 CertaSpray Closed-Cell Spray Foam Insulation must be installed by professional contractors certified, accredited, authorized or approved by CertainTeed Corporation or by the Spray Polyurethane Foam Alliance (SPFA).

- 5.4 CertaSpray Closed-Cell Spray Foam Insulation must be separated from the building interior as described in Section 4.3.1, except when installation is in attics and crawl spaces as described in Section 4.4.

- 5.5 Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 303.1.1 and 303.1.2, as applicable.

- 5.6 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2012 IBC Section 2603.9 (2009 IBC Section 2603.8) or IRC Section R318.4, as applicable.

- 5.7 The Part A component is produced in Geismar, Louisiana, under a quality control program with inspections by ICC-ES.

- 5.8 The Part B component is produced in Mississauga, Ontario, Canada, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated November 2012 (editorially corrected April 2013), including reports of tests in accordance with Appendix B and Appendix X of AC377.

- 6.2 Reports of air leakage tests in accordance with ASTM E283.

- 6.3 Report of potential heat in accordance with NFPA 259.

- 6.4 Report of room corner test in accordance with NFPA 286.

- 6.5 Report of room corner test in accordance with UL1715.

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; and the evaluation report number (ESR-2669).

Each pail of Flame Seal TB intumescent coating is labeled with the manufacturer's name (FlameSeal Products) and address, the product trade name (Flame Seal TB) and either the date of manufacture or the expiration date.

Each pail of Fireshell[®] F10E intumescent coating is labeled with the manufacturer's name (TPR²) and address, the product trade name (Fireshell[®] F10E) 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:

- 2006 and 2003 *International Building Code*® (IBC)
- 2006 and 2003 *International Residential Code*® (IRC)
- 2006 and 2003 *International Energy Conservation Code*® (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 complies with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report 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 2006 IRC Section R314.4 (2003 IRC Section R314.1.12), as applicable.
- **Application with a Prescriptive Ignition Barrier:** See Section 4.4.1, except attics must be vented in

accordance with IBC Section 1203.2 or IRC Section R806, and crawl space ventilation must be in accordance with IBC Section 1203.3 or IRC Section R408, as applicable. Additionally, an ignition barrier must be installed in accordance with 2006 IRC Section R314.5.3 or R314.5.3 (2003 IRC Section R314.2.3), as applicable.

- **Application without a Prescriptive Ignition Barrier:** See Section 4.4.2, except attics must be vented in accordance with IBC Section 1203.2 or IRC Section R806, and crawl space ventilation must be in accordance with IBC Section 1203.3 or IRC Section R408, as applicable.
- **Protection Against Termites:** See Section 5.7, except use of the insulation in areas where the probability of termite infestation is “very heavy” must be in accordance with 2006 IRC Section R320.5 (2003 IRC Section R320.4), as applicable.

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

Thickness (inches)	R-Value (h-ft ² -°F/Btu)
1	5.8
1½	8.7
2	12
2½	16
3	19
3½	22
4	26
4½	29
5	32
5½	36
6	39
7	45
8	51
9	58
10	64
11	71
12	77

For SI: h-ft²-°F/BTU = 0.176 K-m²/W, 1 inch = 25.4 mm.
¹R-values are calculated based on tested K-values at 1-inch and 4-inch thickness.

TABLE 2—NFPA 285 COMPLYING WALLS WITH CERTASPRAY™ SPF

Wall Component	Materials
Base wall system – Use either 1, 2 or 3	1 – Concrete wall 2 – Concrete Masonry wall 3 – 1 layer – 5/8-inch thick Type X Gypsum wallboard on interior, installed over steel studs: minimum 3 5/8-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4 ft. vertically
Floorline Firestopping	4 lb/cu ft. mineral wool insulation in each stud cavity at each floorline – attached with Z-clips or equivalent
Cavity Insulation – Use either 1, 2 or 3	1 – None 2 – Maximum 2 inches of CertaSpray™ SPF applied using sheathing as substrate and covering the width of the cavity and inside the stud flange 3 – Fiberglass batt insulation (faced or unfaced)
Exterior sheathing – Use either 1 or 2	1 – 1/2-inch thick, exterior type gypsum sheathing 2 – 5/8-inch thick, exterior type gypsum sheathing
Exterior insulation	CertaSpray™ SPF – Total thickness to be a maximum of nominal 3 inches.
Exterior Veneer – Use either 1, 2, 3, 4, 5 or 6	1 – Brick <ul style="list-style-type: none"> – Brick veneer anchors – standard types – installed maximum 24 inches OC vertically on each stud – Maximum 2-inch air gap between exterior insulation and brick – Standard nominal 4-inch thick, clay brick 2 – Stucco – Minimum 3/4-inch thick, exterior cement plaster and lath. A secondary water-resistive barrier may be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3 – Minimum 2-inch thick Limestone, natural stone or minimum 1 1/2 inch thick cast artificial stone. Any standard non-open-jointed installation technique such as ship-lap, etc. can be used. 4 – Terracotta cladding – Use any terracotta cladding system in which the terracotta is 1 1/4 inch minimum. Any standard non-open-jointed installation technique such as ship-lap, etc. can be used. 5 – Minimum 2 inch thickness of non-open-jointed concrete. 6 – Concrete masonry units (CMU) with a minimum equivalent thickness of 2 inches and with non-open-jointed installation.