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ESR-2668

Valid: 11/14 to 11/15

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

CERTAINTED CORPORATION

750 EAST SWEDESFORD ROAD
VALLEY FORGE, PENNSYLVANIA 19482

EVALUATION SUBJECT:
CertaSpray Open-Cell Spray Foam Insulation

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1.0 EVALUATION SCOPE
   Compliance with the following codes:
   - 2012 and 2009 International Building Code® (IBC)
   - 2012 and 2009 International Residential Code® (IRC)
   - Other Codes (see Section 8.0)

   Properties evaluated:
   - Surface-burning characteristics
   - Attic and crawl space installation
   - Physical properties
   - Air permeability
   - Thermal resistance

2.0 USES
   CertainTeed CertaSpray Open-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/ceiling assemblies, and when installed in accordance with Section 4.4 in attics and crawl spaces.

3.0 DESCRIPTION
   3.1 General:
   CertaSpray Open-Cell Spray Foam Insulation is a spray-applied, semirigid, low-density, cellular polyurethane foam plastic insulation. The insulation is a two-component, open-cell, spray-applied, semirigid, polyurethane foam plastic system. The foam plastic has a nominal density of 0.5 pcf. The polyurethane foam plastic is produced by combining a polymeric isocyanate Part A (CertaSpray A) with a resin-based Part B (CertaSpray BOC) on site, during the spraying 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 (152.4 mm) and a nominal density of 0.5 pcf, has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84. Thicknesses of up to 8 inches (203 mm) for wall cavities and 12 inches (205 mm) for ceiling cavities are recognized based on room corner fire testing in accordance with NFPA 286, when covered with minimum 1/2-inch-thick (12.7 mm) gypsum board or an equivalent thermal barrier complying with, and installed in accordance with, the applicable code.

   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 Air Permeability:
   The CertaSpray Open-Cell Spray Foam Insulation is considered air-impermeable, based on testing in accordance with ASTM E283, when installed at a thickness of 3.5 inches (89 mm) or greater.

   3.5 Intumescent Coatings:
   3.5.1 CertaCoat IC: CertaCoat IC, manufactured by CertainTeed Corporation, is a one-component, water-based polymer intumescent coating. The coating is supplied in 5-gallon (19 L) pails and has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 50°F and 80°F (10°C and 27°C).

   3.5.2 Flame Seal TB: Flame Seal TB, manufactured by Flame Seal Products Inc., 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).

   3.5.3 Bay Seal IC: Bay Seal IC, manufactured by Bayer MaterialScience, LLC is a one-component, water-based polymer coating. 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).
one year when stored in a factory-sealed container at temperatures of 50°F (10°C) and above.

4.0 INSTALLATION

4.1 General:
CertaSpray Open-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 6 inches (152.4 mm) per pass to the maximum thicknesses specified in Sections 3.2 and 4.4. CertaSpray Open-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 Open-Cell Spray Foam Insulation at the maximum thickness specified in Section 3.2 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.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier: When CertaSpray Open-Cell Spray Foam Insulation is applied 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, and must be installed in a manner so that the foam plastic insulation is not exposed. The insulation may be installed as described in this section in unventted 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 Open-Cell Spray Foam Insulation is installed in accordance with Sections 4.4.2.1, 4.4.2.2, 4.4.2.3 and 4.4.2.4, 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.
- 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 the 2012 IRC Section R806.5 (2009 IRC Section R806.4). Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with International Mechanical Code (IMC) Section 701.

4.4.2.1 Application with Flame Seal TB Intumescent Coating: In attics, CertaSpray Open-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 with Bay Seal IC Intumescent Coating: In attics, CertaSpray Open-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 Bay Seal IC, applied in accordance with the coating manufacturer’s instructions at a minimum application rate of 0.60 gallon per 100 square feet, resulting in a 5-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 the adhesion of the coating. The Bay Seal IC coating is applied with brush, roller or airless sprayer at ambient temperatures between 50°F and 115°F (10°C and 46°C) and relative humidity of less than 75 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.

4.4.2.3 Application with CertaCoat IC Intumescent Coating: In attics, CertaSpray Open-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 (305 mm). The foam plastic must be...
covered with CertaCoat IC, applied in accordance with the coating manufacturer’s instructions at a minimum application rate of 0.50 gallon per 100 square feet, resulting in a 3.2-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 the adhesion of the coating. The CertaCoat IC coating is applied with brush, roller or airless sprayer at ambient temperatures between 50°F and 115°F (10°C and 46°C) and relative humidity of less than 75 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.

4.4.2.4 Application with Fiberglass Batt Insulation: In attics, CertaSpray Open-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 8 inches (203 mm). The foam plastic must be covered with minimum 3 1/2-inch-thick (89 mm) unfaced fiberglass batt insulation held in place using No. 16 gage steel wire spaced at 18 inches (457 mm) on center.

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.

4.4.2.5 Use on Attic Floors: CertaSpray Open-Cell Spray Foam Insulation may be installed between joists in attic floors without a prescriptive ignition barrier or it may be installed with one of the intumescent coatings described in Section 4.2.2.1, 4.2.2.2 and 4.2.2.3 at a maximum thickness of 12 inches (304 mm), or covered with a minimum 3 1/2-inch-thick (89 mm) unfaced fiberglass insulation at a maximum thickness of 8 inches (203 mm). 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.

5.0 CONDITIONS OF USE

The CertaSpray Open-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 Open-Cell Spray Foam Insulation and coatings described in this report 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 A vapor retarder must be installed in accordance with the applicable code.

5.4 The thickness and density of the insulation must not exceed what is specified in Sections 3.2 and 4.4.

5.5 CertaSpray Open-Cell Spray Foam Insulation must be applied by contractors certified by CertainTeed Corporation.

5.6 CertaSpray Open-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 4.4.2.

5.7 Jobsite certification and labeling of the insulation must comply with 2012 IRC Sections N1101.12.1 and N1101.12.1.1 (2009 IRC Sections N1101.4 and N1101.4.1) and 2012 IECC Sections C303.1.1 and C303.1.1.1 or R303.1.1 and R303.1.1.1 (2009 IECC Sections 303.1.1 and 303.1.1.1), as applicable.

5.8 In areas where the probability of termite infestation is “very heavy” as determined in accordance with 2012 IBC Figure 2603.9 (2009 IBC Figure 2603.8) or IRC Figure R301.2 (6), the foam plastic must be installed in accordance with 2012 IBC Section 2603.9 (2009 IBC Section 2603.8) or IRC Section R318.4.

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

5.10 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).

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

6.3 Reports of room corner tests in accordance with NFPA 286.

6.4 Reports of tests in accordance with Appendix X of AC377, dated June 2009.

6.5 Report of critical radiant heat flux of exposed attic floor insulation in accordance with ASTM E970.

7.0 IDENTIFICATION

The Part A and Part B components for CertaSpray Open-Cell Spray Foam Insulation are packaged in 55-gallon drums that bear the report holder’s name (CertainTeed Corporation) and address; the date of manufacture or the lot number; the product trade name (CertaSpray); the product type (Part A or Part B); the installation instructions; the density; the flame-spread and smoke-developed indices; and the evaluation report number (ESR-2668).

Each pail of Flame Seal TB, CertaCoat IC or Bay Seal IC intumescent coating is labeled with the manufacturer’s name (Flame Seal Products, CertainTeed Corporation or Bayer MaterialScience) and address and the product trade name.

8.0 OTHER CODES

8.1 Scope:

In addition to the codes referenced in Section 1.0, the products recognized in this report have also been evaluated for compliance with the requirements of the following codes:
■ 2006 International Residential Code® (2006 IRC)
■ BOCA® National Building Code/1999 (BNBC)
■ 1999 Standard Building Code® (SBC)
■ 1997 Uniform Building Code™ (UBC)

■ Application with a Prescriptive Thermal Barrier: See Section 4.3, 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 and crawl spaces must be vented in accordance with Section 1203.2 of the 2006 IBC and crawl space ventilation must be in accordance with 2006 IBC Section 1203.3 or 2006 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; Section 2603.4.1.4 of BNBC; Section 2603.5.1.6 of SBC; or Section 2602.4 of UBC, as applicable.

■ Application without a Prescriptive Ignition Barrier: See Section 4.4.2, except attics and crawl spaces must be vented in accordance with Section 1203.2 of the 2006 IBC and crawl space ventilation must be in accordance with 2006 IBC Section 1203.3 or 2006 IRC Section R408, as applicable.

■ Protection against Termites: See Section 5.8, except use of the insulation in areas where the probability of termite infestation is “very heavy” must be in accordance with Section 2603.8 of the 2006 IBC, or Section R320.5 of the 2006 IRC or Section 2304.1.4 of the SBC.

■ Jobsite Certification and Labeling: See Section 5.7, except jobsite certification and labeling must comply with Section 102.1.1 and 102.1.11, as applicable, of the 2006 IECC.

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

<table>
<thead>
<tr>
<th>THICKNESS (inches)</th>
<th>R-VALUE (°F.ft².h/Btu)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>3.7</td>
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<tr>
<td>1.5</td>
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<td>2</td>
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<tr>
<td>11</td>
<td>41.0</td>
</tr>
<tr>
<td>12</td>
<td>45.0</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm; 1°F.ft².h/Btu = 0.176 110°K.m²/W