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This report is subject to re-examination in one year.

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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07210—Building Insulation

REPORT HOLDER:

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EVALUATION SUBJECT:

BASF POLYURETHANE FOAM ENTERPRISES SPRAY-APPLIED INSULATIONS: SPRAYTITE 158, SPRAYTITE 178, SPRAYTITE 81205, SPRAYTITE 81206, COMFORT FOAM 158, COMFORT FOAM 178 AND WALLTITE

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)
- Legacy Codes (see Section 8)

Properties evaluated:

- Physical properties
- Surface burning characteristics
- Water vapor transmission
- Attic and crawl space installation
- Fire-resistance-rated construction

2.0 USES

SPRAYTITE 158, SPRAYTITE 178, SPRAYTITE 81205, SPRAYTITE 81206, COMFORT FOAM 158, COMFORT FOAM 178 and WALLTITE spray- applied insulations are used as thermal insulating material in cavities of wall, floor and ceiling assemblies, and in attic and crawl space applications as described in Section 4.4. SPRAYTITE 158, SPRAYTITE 81205 and COMFORT FOAM 158 may also be used in fire-resistance-rated construction as described in Section 4.5.

3.0 DESCRIPTION

3.1 General:

SPRAYTITE 158, SPRAYTITE 178, SPRAYTITE 81205, SPRAYTITE 81206, COMFORT FOAM 158, COMFORT FOAM 178 and WALLTITE are two-component, closed-cell, semirigid foam plastic insulations. The insulation is produced in the field by combining an isocyanate component A with a resin component B, resulting in products with a density ranging from 1.75 to 2.25 pcf (28 to 36 kg/m^3). SPRAYTITE 158, SPRAYTITE 178, COMFORT FOAM 158 and COMFORT FOAM 178 use the same A component, designated as FE800A. SPRAYTITE 81205, SPRAYTITE 81206 and WALLTITE all use an A component designated as ELASTOSPRAY 8000A. Each insulation uses a different proprietary blend for the B component, as defined in the quality documentation. The insulation components have a shelf life of three months when stored at temperatures between 50°F (10°C) and 80°F (27°C) before installation.

3.2 Surface-burning Characteristics:

The insulations have 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 at a maximum thickness of 4 inches (114 mm).

Thicknesses of up to 8 inches (203 mm) for wall cavities and 12 inches (305 mm) for ceiling cavities are recognized, based on testing in accordance with NFPA 286.

3.3 Thermal Transmission:

SPRAYTITE 158, SPRAYTITE 81205 and COMFORT FOAM 158 have a thermal resistance (*R*-value) of 5.6 ft^{2}hr°F/Btu, for a 1-inch thickness at a mean temperature of 75°F (24°C). SPRAYTITE 178, SPRAYTITE 81206, COMFORT FOAM 178 and WALLTITE have a thermal resistance (*R*-value) of 5.1 ft^{2}hr°F/Btu, for a 1-inch thickness at a mean temperature of 75°F (24°C).

3.4 Vapor Retarder:

SPRAYTITE 158, SPRAYTITE 81205 and COMFORT FOAM 158, at a minimum thickness of 3 inches (76 mm); and SPRAYTITE 178, SPRAYTITE 81206, COMFORT FOAM 178 and WALLTITE at a minimum thickness of 2 inches (51 mm), have a permeance of 1 perm [57 x 10^{-11} kg /(m^{2}sPa)] or less, in accordance with ASTM E 96, and may be used where a vapor retarder is required by the applicable code.

3.5 ELASTOCOAT 1500 Ignition Barrier:

ELASTOCOAT 1500 Ignition Barrier coating is supplied by BASF Polyurethane Foam Enterprises, LLC. The coating is available in both 5- and 55-gallon containers (18.9 and 208 L) and has a shelf life of six months when stored in a factory-sealed container at temperatures between 50°F (10°C) and 80°F (26.7°C).

4.0 INSTALLATION

4.1 General:

The BASF Polyurethane Foam Enterprises spray-applied insulations must be installed in accordance with the manufacturer's published installation instructions, the applicable code and this report. The manufacturer's published installation instructions must be available on the jobsite at all times during installation.

4.2 Application:

The insulation is spray-applied at the jobsite using a volumetric positive displacement pump as recommended in the manufacturer's published installation instructions. The insulation is applied in passes having a minimum thickness of $^1/_2$ inch and a maximum thickness of 2 inches (51 mm) per pass, and must not exceed a total thickness of 8 inches (203 mm) in wall cavities and 12 inches (305 mm) in ceiling cavities. The insulation passes must be allowed to fully expand and be cured for a minimum of 15 minutes prior to application of an additional pass. The insulation must not be used in areas that have a maximum service temperature greater than 180°F (82°C). The foam plastic insulation must not be used in electrical outlet or junction boxes or in contact with rain, water, or soil. The substrate must be free of moisture, frost or ice, loose scales, rust, oil, and grease. The insulation must be protected from the weather during and after application.

4.3 Thermal Barrier:

The spray-applied insulations must be separated from the interior of the building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R314.4, as applicable, except where installation is in an attic or crawl space as described in Section 4.4.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier: When the spray-applied insulations are 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 Sections R314.5.3 and 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.

4.4.2 Application without a Prescriptive Ignition Barrier: In attics, SPRAYTITE 178, SPRAYTITE 81206, COMFORT FOAM 178 or WALLTITE may be applied to walls and to the underside of roof sheathing or roof rafters; and in crawl spaces, to walls and 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 7 inches (178 mm). The thickness of the foam plastic applied to the vertical surfaces must not exceed 3 inches (76 mm). The foam plastic must be covered with ELASTOCOAT 1500 Ignition Barrier, as described in Section 3.5. 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. ELASTOCOAT 1500 Ignition Barrier is applied with a medium-size nap roller, soft brush or conventional airless spray equipment at a minimum of 1 gallon (3.75 L) per 100 ft^2, (9.29 m^2), resulting in a minimum dry film thickness of 18 mils (0.46 mm). The coating must be applied when ambient and substrate temperatures are within a range of 50°F (10°C) to 90°F (32°C) and requires a 24-hour curing time. SPRAYTITE 178, SPRAYTITE 81206, COMFORT FOAM 178 or WALLTITE covered with ELASTOCOAT 1500 Ignition Barrier may be installed in accordance with this section only under the following conditions:

- Entry to the attic or crawl space is limited to service of utilities and there are no heat-producing appliances.
- There are no interconnected basement or service 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.

4.5 Fire Resistance:

SPRAYTITE 158, SPRAYTITE 81205 or COMFORT FOAM 158 may be installed on interior load-bearing two-hour fire-resistance-rated walls, provided the system is installed in accordance with the following:

4.5.1 Wood Framing: Two rows on separate plates, 3 inches (76 mm) apart, of minimum 2-by-4 wood studs (No. 2 Douglas fir) spaced a maximum of 16 inches (406 mm) on center.

4.5.2 Wall Finish: Base layer of $^5/_8$-thick (15.9 mm), Type X gypsum wallboard is applied horizontally and fastened to each outer side of a double row of studs with 6d by $1^7/_8$-inch-long (48 mm) coated nails, spaced 2 feet (610 mm) on center. Face layer of $^5/_8$-inch-thick (15.9 mm), Type X gypsum board is applied horizontally and fastened to each outer side of studs over the base layer with 8d by $2^3/_8$-inch-long (60 mm) coated nails, spaced 8 inches (203 mm) on centers. Gypsum wallboard joints must be staggered 24 inches (610 mm) between layers and on opposite sides of the wall.

4.5.3 Insulation: SPRAYTITE 158, SPRAYTITE 81205 or COMFORT FOAM 158 is applied in the stud cavities of both rows at a thickness of 3 inches (76 mm).

5.0 CONDITIONS OF USE

The BASF Polyurethane Foam Enterprises spray-applied insulations described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The spray-applied insulations and the ELASTOCOAT 1500 must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. The instructions within this report govern if there are any conflicts between the manufacturer's published installation instructions and this report.

5.2 The spray-applied insulations must be separated from the interior of the building by an approved 15-minute thermal barrier, as described in Section 4.3, except where installation is in an attic or crawl space as described in Section 4.4.

5.3 The spray-applied insulations must not exceed the thicknesses noted in Sections 3.2 and 4.4.2.

5.4 The spray-applied insulations must be protected from the weather during and after application.

5.5 The spray-applied insulations must be applied by installers certified by BASF Polyurethane Foam Enterprises.

5.6 The spray-applied insulations may be used in any buildings under the IRC, within the parameters set forth in IRC Section R314. The spray-applied insulations were evaluated for use in Type V-B construction under the IBC. Additionally, SPRAYTITE 158, SPRAYTITE 81205 or COMFORT FOAM 158 may be used where a two-hour fire-resistance-rated wall is required, provided the system is installed as described in Section 4.5.

5.7 When the spray-applied insulations are installed in buildings of wood construction, the installation must not be on the exterior of foundation walls or below floor slabs on the ground or in contact with the ground. The insulation must have a clearance above grade and exposed earth of 6 inches (52 mm) or greater.

5.8 Insulation installers must provide certification and labeling complying with IRC Section N1101.4 or IECC Section 102.1.1, as applicable.

5.9 The polyurethane foam plastic insulation components are produced in Houston, Texas, and Minneapolis, Minnesota, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated October 2007.

6.2 Data in accordance with ASTM E 119.

7.0 IDENTIFICATION

Each container of components A and B of the polyurethane foam plastic insulation bears a label with the BASF Polyurethane Foam Enterprises, LLC, name and address, the product name, the product type (A or B component), density, the flame- spread and smoke-developed indices, the evaluation report number (ESR-2642), the shelf life and the date of manufacture. The containers also bear the name of the inspection agency (Underwriters Laboratories Inc.).

Each pail of Elastocoat 1500 Ignition Barrier coating is labeled with the BASF Polyurethane Foam Enterprises, LLC, report holder's name and the product name (Elastocoat 1500 Ignition Barrier).

8.0 LEGACY CODES

8.1 Evaluation Scope:

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

- BOCA® *National Building Code*/1999 (BNBC)
- 1999 *Standard Building Code*© (SBC)
- 1997 *Uniform Building Code*™ (UBC)

8.2 Uses:

See Section 2.0.

8.3 Description:

8.3.1 General: See Section 3.1.

8.3.2 Surface Burning Characteristics:

8.3.2.1 BNBC and SBC: See Section 3.2.

8.3.2.2 UBC: The insulations have a flame-spread index of less than 25 and a smoke-developed index of less than 450 when tested in accordance with UBC Standard 8-1 to a maximum thickness of 4 inches (114 mm).

Thicknesses of up to 8 inches (203 mm) for wall cavities and 12 inches (305 mm) for ceiling cavities are recognized, based on testing in accordance with NFPA 286.

8.3.3 Thermal Transmission: See Section 3.3.

8.3.4 Vapor Retarder: See Section 3.4.

8.3.5 Elastocoat 1500 Ignition Barrier: See Section 3.5.

8.4 Installation:

8.4.1 General: See Section 4.1.

8.4.2 Application: See Section 4.2.

8.4.3 Thermal Barrier: The spray-applied insulations must be separated from the interior of the building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or an equivalent 15-minute thermal barrier complying with BNBC Section 1503.4, SBC Section 2603.5 or UBC Section 2603.4, as applicable, except where installation is in an attic or crawl space as described in Section 3.4.

8.4.4 Attics and Crawl Spaces:

8.4.4.1 Application with a Prescriptive Ignition Barrier: When the spray- applied insulations are installed within attics or crawl spaces where entry is made only for service of utilities, an ignition barrier must be installed in accordance with 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.

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

8.4.5 Fire Resistance: See Section 4.5.

8.5 Conditions of Use:

The BASF Polyurethane Foam Enterprises spray-applied insulations described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 8.0 of this report, subject to the following conditions:

8.5.1 See Section 5.1.

8.5.2 The spray-applied insulations must be separated from the interior of the building by an approved 15-minute thermal barrier, as described in Section 8.4.3, except where installation is in an attic or crawl space as described in Section 8.4.4.

8.5.3 See Section 5.3.

8.5.4 See Section 5.4.

8.5.5 See Section 5.5.

8.5.6 The spray-applied insulations were evaluated for use in Type 5-B construction under the BNBC, Type VI under the SBC and Type V-N under the UBC. Additionally, SPRAYTITE 158, SPRAYTITE 81205 or COMFORT FOAM 158 may be used where a two-hour fire-resistance-rated wall is required, provided the system is installed as described in Section 8.4.5.

8.5.7 In jurisdictions that have adopted the SBC, and when the spray-applied insulations are installed in buildings of wood construction, the installation must not be on the exterior of foundation walls or below floor slabs on the ground or in contact with the ground. The insulation must have a clearance above grade and exposed earth of 6 inches (52 mm) or greater.

8.5.8 See Section 5.9.

8.6 Evidence Submitted:

See Section 6.0.

8.7 Identification:

See Section 7.0.