ICC-ES Evaluation Report

ESR-2780

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This report is subject to re-examination in two years.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

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EVALUATION SUBJECT:

ER-FOAM 502072 SPRAY-APPLIED INSULATION

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 *International Building Code*® (IBC)
- 2009 *International Residential Code*® (IRC)
- 2009 *International Energy Conservation Code*® (IECC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Physical properties
- Surface-burning characteristics
- Water vapor transmission
- Attic and crawl space installation
- Air permeability

2.0 USES

ER-FOAM 502072 spray-applied insulation is used as a thermal insulating material in cavities of wall, floor and ceiling assemblies, and in attic and crawl space applications as described in Section 4.4. 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:

ER-FOAM 502072 is a two-component, closed-cell, rigid foam plastic insulation. The insulation is produced in the field by combining an isocyanate component A with a resin component B, resulting in a product having a nominal density of 2.0 pcf (32 kg/m^3). The insulation component B has a shelf life of three months, and the A component has a shelf life of nine months, when stored at temperatures between 50°F (10°C) and 80°F (27°C) before installation.

3.2 Surface-burning Characteristics:

The insulation 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 at a maximum thickness of 4 inches (102 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, when covered with a $^1/_2$ 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 Vapor Retarder:

The insulation has a vapor permeance of less than 1 perm [5.7 x 10^{-11} kg /(Pasm^2)], in accordance with ASTM E 96, when applied at a minimum thickness of 2 inches (51 mm), and qualifies as a Class II vapor retarder.

3.5 Air Permeability:

ER-FOAM 502072 spray-applied polyurethane foam insulation, at a minimum thickness of 1 inch (25.4 mm), is considered air-impermeable insulation in accordance with Section R806.4 of the IRC, based on testing in accordance with ASTM E 283.

3.6 ALDOCOAT 800 Intumescent Coating:

ALDOCOAT 800 intumescent coating is manufactured by Aldo Products Company and is a water-based latex coating supplied in both 5-gallon and 55-gallon containers (18.9 and 208 L). The materials have a shelf life of six months when stored in a factory-sealed container at temperatures between 40°F (4.5°C) and 90°F (32°C).

3.7 NoBurn® Plus Intumescent Coating:

NoBurn® Plus intumescent coating, manufactured by No-Burn, Inc., is a translucent aqueous liquid supplied in 1- and 5-gallon (3.8 and 18.8 L) pails and 55-gallon (208 L) drums. The coating has a shelf life of three years when stored in a factory-sealed container at temperatures between 40°F (4.5°C) and 90°F (32°C).

4.0 INSTALLATION

4.1 General:

The insulation 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 (12.7 mm) and a maximum thickness of 2 inches (51 mm) per pass. 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 insulation 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 R316.4, as applicable, except where installation is in an attic or crawl space as described in Section 4.4. 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.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier: When the spray-applied 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 Sections R316.5.3 and 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.

4.4.2 Application without a Prescriptive Ignition Barrier: The insulation may be installed in attics and crawl spaces as described in this section without the ignition barriers described in IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4, subject to the following conditions:

a. Entry to the attic or crawl space is 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. 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 IRC. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.

e. Combustion air is provided in accordance with *International Mechanical Code (*IMC) Section 701.

In attics, the insulation may be spray-applied with no covering (no ignition barrier) to the underside of roof sheathing or roof rafters, and/or vertical surfaces. In crawl spaces, the insulation may be spray-applied with no covering (ignition barrier) to the underside of floors and/or vertical surfaces. The thickness of the foam plastic, applied to the underside of the top of the space and/or vertical surfaces must not exceed values set forth in Table 2. 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 intumescent coating is applied with a medium-size nap roller, soft brush or conventional airless spray equipment at a rate specified in Table 2. The coating must be applied when ambient and substrate temperatures are above of 50°F (10°C). The coating requires a 24-hour curing time. The insulation may be installed in unvented attics as described in this section in accordance with IRC Section R806.4.

4.4.3 Use on Attic Floors: ER-FOAM 502072 insulation may be installed in accordance with this section and Table 2 at a maximum thickness of $9^1/_4$ inches (235 mm) between and over the joists in an attic floor. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier required in IBC Section 2603.4.1.6 and IRC Section R316.5.3 may be omitted.

5.0 CONDITIONS OF USE

The Elastomeric Roofing Systems, Inc., ER-FOAM 502072 spray-applied 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 spray-applied insulation and the intumescent coatings must be installed in accordance with the manufacturers' published installation instructions, this evaluation report and the applicable code. The instructions within this report govern if there are any conflicts between the manufacturers' published installation instructions and this report.

5.2 The spray-applied insulation 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 insulation must not exceed the thicknesses noted in Sections 3.2, 4.4.2, and 4.4.3.

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

5.5 The spray-applied insulation must be applied by installers certified by Elastomeric Roofing Systems, Inc, or by the Spray Polyurethane Foam Alliance (SPFA) for the installation of spray polyurethane foam insulation.

5.6 The spray-applied insulation may be used in any building under the IRC, within the parameters set forth in IRC Section 316. The spray-applied insulation was evaluated for use in Type V-B construction under the IBC.

5.7 Use of the insulation in areas where the probability of termite infestation is "very high" must be in accordance with IBC Section 2603.8 or IRC Section R318.4, as applicable.

5.8 Insulation 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.

5.9 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 June 2009, including reports of tests in accordance with Appendix X of AC377.

6.2 Reports of water vapor transmission tests in accordance with ASTM E 96.

6.3 Reports of Air leakage testing in accordance with ASTM E 283.

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

7.0 IDENTIFICATION

Each container of components A and B of the polyurethane foam plastic insulation bears a label with the Elastomeric Roofing Systems, Inc., 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-2780), the shelf life and the date of manufacture. The containers also bear the name of the inspection agency (Underwriters Laboratories Inc.).

Aldocoat 800 intumescent coating is identified with the manufacturer's name (Aldo Products Company) and address, the product trade name and use instructions.

NoBurn® Plus intumescent coating is identified with the manufacturer's name (No-Burn, Inc.) and address, the product trade name, and use instructions.

8.0 OTHER CODES

8.1 Evaluation Scope:

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

- 2006 *International Building Code*®
- 2006 *International Residential Code*®
- 2006 *International Energy Conservation Code*®
- 2003 *International Building Code*®
- 2003 *International Residential Code*®
- 2003 *International Energy Conservation Code*®
- 2000 *International Building Code*®
- 2000 *International Residential Code*®
- 2000 *International Energy Conservation Code*®

8.2 Uses:

The products comply with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report, with the following modifications:

- **Application with a Prescriptive Ignition Barrier:** See Section 4.4.1, except attics and crawl spaces must be vented in accordance with the applicable code.
- **Application without a Prescriptive Ignition Barrier:** See Section 4.4.2, except attics and crawl spaces must be vented in accordance with the applicable code.

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

ASTM C 518 TESTED VALUES	
1	6.7
4	27.6
CALCULATED R-VALUES[1]	
2	13.4
3	20.1
3.5	24.2
5	34.5
6	41.4
7	48.3
8	55.2
10	69.1
11	76
12	82.9

For **SI:** 1 inch = 25.4 mm; 1 ˚F.ft^2.h/Btu = 0.176 110 ˚K.m^2/W.

[1]Calculated *R*-values are based on tested K values at a 4-inch thickness.

TABLE 2—USE OF ER-FOAM 502072 INSULATION IN ATTICS AND CRAWL SPACES WITHOUT A PRESCRIPTIVE IGNITION BARRIER

MAXIMUM INSULATION THICKNESS (IN) (WALL CAVITIES & ATTIC FLOORS)	MAXIMUM INSULATION THICKNESS (in) (CEILING & UNDERSIDE OF RAFTERS)	INTUMESCENT COATING MINIMUM THICKNESS & TYPE (APPLIED TO ALL FOAM SURFACES)	MINIMUM APPLICATION RATE OF THE INTUMESCENT COATING	TESTS SUBMITTED (AC377)
$9^1/_4$	$11^1/_4$	18 wet mils of ALDOCOAT 800	1.12 gallons per 100 ft^2	Appendix X
$9^1/_4$	$11^1/_4$	No coating required	NA	Appendix X
$9^1/_4$	$11^1/_4$	12 wet mils of NoBurn Plus	0.75 gallon per 100 ft^2	Appendix X

For **SI:** 1 inch = 25.4 mm; 1 mil = 0.0254 mm; 1 gallon = 3.38 L; 1 ft^2 = 0.93 m^2; NA = not applicable.