



ICC-ES Evaluation Report

Reissued April 2022

ESR-3686

This report is subject to renewal August 2023.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

ENERGYONE AMERICA LLC

EVALUATION SUBJECT:

EOA 500 SPRAY-APPLIED POLYURETHANE FOAM PLASTIC INSULATION

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2018, 2015, 2012 and 2009 *International Energy Conservation Code*® (IECC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Surface-burning characteristics
- Physical properties
- Thermal resistance (*R*-values)
- Attic and crawl space installation
- Air permeability
- Exterior walls in Types I-IV construction

1.2 Evaluation to the following green standard:

- 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

EOA 500 spray polyurethane foam plastic insulation is used as a nonstructural thermal insulating material in buildings of Type I, II, III, IV and V (IBC) construction, and in dwellings

built under the IRC. The insulation is for use in wall cavities and floor/ceiling assemblies, and in attics and crawl spaces when installed as described in Section 4.4. Under the IRC, the insulation may be used as air-impermeable insulation when installed as described in Section 3.4.

3.0 DESCRIPTION

3.1 General:

EOA 500 spray polyurethane foam plastic insulation is a two-component, open cell, one-to-one-by-volume spray-applied polyurethane foam system with a nominal density of 0.5 pcf (8.0 kg/m²). The insulation's liquid components are supplied in nominally 55-gallon drums, labeled as "A" component or "B" component. The insulation components have a shelf life of six months when stored in unopened containers at temperatures between 70°F (21°C) and 90°F (32°C).

The attributes of the insulation have been verified as conforming to the provisions of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Surface-burning Characteristics:

At a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf, 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 E84. Thicknesses for wall cavities and ceiling cavities are not limited when the insulation is covered with a minimum 1/2-inch-thick (12.7 mm) gypsum board 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 insulation, at a minimum thickness of 3 inches (76 mm), is considered air-impermeable in accordance with 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or

2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4), based on testing in accordance with ASTM E283.

3.5 DC 315 Coating:

DC 315 Coating is manufactured by International Fireproof Technology, Inc. / Paint to Protect Inc. ([ESR-3702](#)), and is a water-based intumescent coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of twelve months when stored in a factory-sealed container at temperatures between 50°F (10°C) and 80°F (27°C).

3.6 FireShell® F10E:

FireShell® F10E is manufactured by ICP Construction ([ESR-3997](#)), and is a water-based coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of one year when stored in a factory-sealed container at temperatures between 45°F (7.2°C) and 95°F (35°C).

4.0 INSTALLATION

4.1 General:

EOA 500 spray insulation must be installed in accordance with the manufacturer's published installation instructions 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 at the jobsite using a volumetric positive displacement pump as identified in the EOA 500 spray application manual. The insulation components must be stored at temperatures between 70°F (21°C) and 90°F (32°C) for several days before application. The insulation must not be used in areas that have maximum in-service temperatures greater than 180°F (82°C). The insulation must not be used in electrical outlet or junction boxes or in contact with water (e.g., rain, condensation, ice, snow) or soil. The substrate must be free of moisture, frost or ice, loose scales, rust, oil, grease or other surface contaminants. The insulation can be installed in one pass to the maximum thickness. The spray-applied foam insulation must be protected from weather during and after installation.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier:

EOA 500 spray polyurethane foam plastic insulation must be separated from the interior of the building by a thermal barrier of 1/2-inch-thick (12.7 mm) gypsum wallboard or an equivalent thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4, as applicable, except when the installation is in accordance with Section 4.3.2. Within an attic or crawl space, installation must be in accordance with Section 4.4.

4.3.2 Application without a Prescriptive Thermal Barrier:

The prescriptive thermal barrier may be omitted when installation is in accordance with this section. The insulation and coating may be spray-applied to the interior facing of walls and the underside of roof sheathing or roof rafters, and in crawl spaces, and may be left exposed as an interior finish without a prescribed thermal barrier or prescribed ignition barrier when the installation is in accordance with either Section 4.3.2.1 or 4.3.2.2.

4.3.2.1 Application with DC 315 Coating ([ESR-3702](#)):

The prescriptive thermal barrier may be omitted when installation is in accordance with this section. The insulation and coating may be spray-applied to the interior facing of walls and ceilings and may be left exposed as an interior

finish without a thermal barrier. The thickness of the foam plastic insulation and intumescent coating applied to the vertical wall surface and underside of ceilings must comply with this section and Table 2. The coating must be applied over the EOA 500 spray polyurethane foam plastic insulation at a minimum wet film thickness and coverage rate indicated in Table 2 in accordance with the coating manufacturer's published 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 or more coats with brush, roller or airless spray equipment.

4.3.2.2 Application with FireShell® F10E ([ESR-3997](#)):

The prescriptive thermal barrier may be omitted when installation is in accordance with this section. The insulation and coating may be spray-applied to the interior facing of walls and ceilings and may be left exposed as an interior finish without a thermal barrier. The thickness of the foam plastic insulation and intumescent coating applied to the vertical wall surface and underside of ceilings must comply with this section and Table 2. The coating must be applied over the EOA 500 spray polyurethane foam plastic insulation at a minimum wet film thickness and coverage rate indicated in Table 2 in accordance with the coating manufacturer's published 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 or more coats with brush, roller or airless spray equipment.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier:

When EOA 500 spray polyurethane foam plastic insulation is installed within attics and 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 the installation is in accordance with Section 4.4.2 or Section 4.4.3. 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. EOA 500 spray polyurethane foam plastic insulation at a minimum thickness of 3 inches (76 mm) may be installed in unvented attics in accordance with 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4), as applicable.

4.4.2 Application without a Prescriptive Ignition Barrier:

Where the spray-applied insulation is installed in accordance with this section or Section 4.4.3, the following conditions apply:

- Entry to the attic or crawl space is to service utilities, and no storage is permitted.
- There are no interconnected attic or crawl space areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Attic ventilation is provided when required by 2018 IBC Section 1202.2.1 (2015, 2012 and 2009 IBC Section 1203.2) or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2018 IBC Section 1202.3 [2015 IBC Section 1203.3] or 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4). Under-floor (crawl space) ventilation is provided when required by 2018 IBC Section 1202.4 [2015 IBC Section 1203.4 (2012 and 2009 IBC Section 1203.3)] or IRC Section R408.1, as applicable.

- e) Combustion air is provided in accordance with *International Mechanical Code*[®] Section 701.

In attics, the insulation may be spray-applied to the underside of roof sheathing or roof rafters, and/or vertical surfaces, and in crawl spaces the insulation may be spray-applied to the underside of floors and/or vertical surfaces as described in this section. The thickness of the foam plastic applied to the underside of the top of the space must not exceed 12 inches (305 mm). The thickness of the foam plastic applied to vertical surfaces must not exceed 11½ inches (292 mm). The foam plastic may be installed without a covering or coating. The insulation may be installed in unvented attics in accordance with 2018 IBC Section 1202.3 [2015 IBC Section 1203.3] or 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4). The ignition barrier in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 may be omitted.

4.4.3 Use on Attic Floors: EOA 500 spray polyurethane foam plastic insulation may be installed exposed at a maximum thickness of 11½ inches (292 mm) between joists in attic floors. The ignition barrier in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 may be omitted. The insulation must be separated from the interior of the building by an approved thermal barrier.

4.5 Exterior Walls of Type I, II, III and IV Construction:

4.5.1 General: When used on walls of Type I, II, III and IV exterior wall construction, the EOA 500 spray polyurethane foam plastic insulation must comply with Section 2603.5 of the IBC and this section. The potential heat of EOA 500 spray polyurethane foam plastic insulation is 466 Btu/ft² (5.26 MJ/m²) per inch of thickness when tested in accordance with NFPA 259.

4.5.2 Specific Wall Assemblies: Wall assemblies must be as described in Table 3.

5.0 CONDITIONS OF USE

The EOA 500 spray polyurethane foam plastic insulation spray polyurethane foam plastic 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 insulation 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 must be separated from the interior of the building by an approved thermal barrier, as described in Section 4.3.1, except when the installation is in accordance with Section 4.3.2. Installation in an attic or crawl space must be as described in Section 4.4.
- 5.3 The insulation must not exceed the thicknesses noted in Sections 3.2, 4.3, and 4.4.
- 5.4 The insulation must be protected from exposure to the weather during and after application.
- 5.5 The insulation must be applied by contractors certified by EnergyOne America.
- 5.6 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2018 and 2015 IBC Section 2603.8 [2012 IBC Section 2603.9 (2009 IBC Section 2603.8)] or IRC Section R318.4, as applicable.

- 5.7 Jobsite certification and labeling of the insulation must comply with 2018 and 2015 IRC Section N1101.10.1 and N1101.10.1.1 [2012 IRC Section N1101.12.1 and N1101.12.1.1 (2009 IRC Sections N1101.4 and N1101.4.1) and 2018, 2015 and 2012 IECC Section C303.1.1, C303.1.1.1, R303.1.1 and R3030.1.1.1 (2009 IECC Sections R303.1.1 and 303.1.1.1), as applicable.

- 5.8 When use is on exterior wall of buildings of Type I, II, III or IV construction, construction must be as described in Section 4.5 and Table 3.

- 5.9 A vapor retarder must be installed in accordance with the requirements of the applicable code.

- 5.10 EOA 500 spray polyurethane foam plastic insulation is produced in St. Louis, Missouri, and Spring, Texas 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 February 2020, including reports of tests in accordance with Appendix X of AC377.
- 6.2 Reports of room corner fire testing in accordance with NFPA 286.
- 6.3 Report of air permeance testing in accordance with ASTM E283.
- 6.4 Report of potential heat testing in accordance with NFPA 259.
- 6.5 Report of fire propagation testing in accordance with NFPA 285.
- 6.6 Engineering evaluation extending NFPA 285 testing to various exterior wall constructions.

7.0 IDENTIFICATION

- 7.1 Components of the EOA 500 spray polyurethane foam plastic insulation are identified with the manufacturer's name (EnergyOne America) and address; the date of manufacture or the lot number; the product trade name (EOA 500 spray polyurethane foam plastic insulation); the mixing instructions; the density; the flame-spread and smoke-developed indices; and the evaluation report number (ESR-3686).

International Fireproof Technology, Inc. / Paint to Protect Inc., DC 315 coating is labeled with the manufacturer's name and address; the product name; the date of manufacture, the shelf life or expiration date; the manufacturer's instructions for application and evaluation report number ([ESR-3702](#)).

ICP Construction Fireshell F10E, is labeled with the manufacturer's name and address; the product name; the date of manufacture, the shelf life or expiration date; the manufacturer's instructions for application and evaluation report number ([ESR-3997](#)).

- 7.2 The report holder's contact information is the following:

ENERGYONE AMERICA LLC
454 JESSEN LANE
CHARLESTON, SOUTH CAROLINA 29492
(843) 388-6260
www.eoa500.com

8.0 OTHER CODES

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

- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)
- 2006 *International Energy Conservation Code*® (2006 IECC)

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

- **Application with and without 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 an ignition barrier must be installed in accordance with Section R314.5.3 or R314.5.4 of the 2006 IRC.

- **Application without a Prescriptive Ignition Barrier:** See Section 4.4.2, except that combustion air is provided in accordance with Sections 701 and 703 of the 2006 IECC.
- **Protection against Termites:** See Section 5.6, except use of the insulation in areas where the probability of termite infestation if “very heavy” must be in accordance with Section R320.5 of the 2006 IRC.
- **Jobsite Certification and Labeling:** See Section 5.7, except jobsite certification and labeling must comply with Sections 102.1.1 and 102.1.1.1, as applicable, of the 2006 IECC.

TABLE 1—THERMAL RESISTANCE (R-VALUES^{1,2})

THICKNESS (inches)	R-VALUE (°F·ft ² ·h/Btu)
1	4.0
2	7.6
3	11
3.5	13
4	15
5	19
6	22
7	26
8	30
9	33
10	37
11	41
12	44

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

¹R-values are calculated based on tested K values at 1- and 3.5-inch thicknesses.

²R-values greater than 10 are rounded to the nearest whole number.

TABLE 2—ALTERNATE ASSEMBLIES WITHOUT A PRESCRIPTIVE THERMAL BARRIER¹

Coating	Max. Insulation Thickness Ceilings	Max Insulation Thickness Wall	Dry Film Thickness	Wet Film Thickness (minimum)	Application Rate	Applicable Report Section	Test Submitted (AC377)
DC315 ² (ESR-3702)	11.5 inches (292 mm)	11.5 inches (292 mm)	12 mils (0.30 mm)	18 mils (0.47 mm)	1.12 gal/100 ft ² (0.51 L/m ²)	4.3.2.1	NFPA 286
DC315 ² (ESR-3702)	14 inches (356 mm)	9 inches (229 mm)	9 mils (0.23 mm)	14 mils (0.36 mm)	0.88 gal/100 ft ² (0.36 L/m ²)	4.3.2.1	NFPA 286
DC315 ² (ESR-3702)	14 inches (356 mm)	8.5 inches (216 mm)	9 mils (0.23 mm)	14 mils (0.36 mm)	0.88 gal/100 ft ² (0.36 L/m ²)	4.3.2.1	NFPA 286
F10E ³ (ESR-3997)	11.5 inches (292 mm)	11.5 inches (292 mm)	14 mils (0.36 mm)	20 mils (0.51 mm)	1.25 gal/100ft ² (0.51 L/m ²)	4.3.2.2	NFPA 286

For SI: 1 inch = 25.4 mm; 1 mil = 0.0254 mm; 1 gallon = 3.785 L; 1 ft² = 0.093 m²

¹See Sections 4.3.2.1 and 4.3.2.2

²See Section 3.5

³See Section 3.6

TABLE 3—NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES

Wall Component	Materials
Base wall system – Use either 1, 2, or 3	1 – Concrete wall 2 – Concrete masonry wall 3 – 1 layer of 5/8-inch thick Type X gypsum wallboard installed on the interior side of minimum 3 5/8 inch deep minimum 20 gauge thick steel studs spaced a maximum of 24 inches on center. Lateral bracing installed minimum every 4 ft. vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 lb/ft ³ mineral-fiber insulation friction fit between steel wall studs.
Resilient Channel – For use with Base Wall System 3 above – Use either 1 or 2	1 – None 2 – Double leg “hat” shaped steel resilient channel installed perpendicular to the wall studs (interior side only) and spaced a maximum of 24 inches on center between steel studs and Type X gypsum wallboard. Entire perimeter of window opening to be framed with resilient channel.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2018, 2015 and 2012 IBC shall be installed to fill the void between the edge of the concrete floor slab and the interior surface of the exterior wall assembly.
Wall Stud Cavity Insulation	Full wall stud cavity depth or less of EOA 500 spray-applied foam plastic insulation applied using exterior gypsum sheathing as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange.
Exterior sheathing – For Base Wall System 3 above	5/8-inch thick Type X exterior type gypsum sheathing complying with ASTM C1177.
Exterior Wall Covering – Use either 1, 2, or 3 (see Note 1 below)	1 – Any noncombustible exterior wall covering material 2 – Any noncombustible exterior wall covering system with a combustible WRB that has successfully been tested in accordance with NFPA 285. 3 – Metal Composite Material (MCM) Mitsubishi Chemical Composites America, Inc., Alpolic®/fr Wall Panels (see ICC-ES ESR-2653) or Arconic Architectural Products, LLC Reynobond® FR 6-mm panels (see ICC-ES ESR-3435) where there is no exterior insulation in the cavity behind the panels.
Flashing of window, door and other exterior wall penetrations.	0.082-inch-thick aluminum flashing. Additional flashing around window, door and other exterior penetrations with limited amounts of maximum 12-inch wide acrylic, asphalt or butyl-based flashing tape or liquid applied membrane material.

For **SI**: 1 inch = 25.4 mm; 1 pcf = 16.0 kg/m³.

Note 1: Exterior wall coverings shall be installed in accordance with the manufacturer’s installation requirements and must comply with the applicable provisions of IBC Chapter 14 and IRC Chapter 7.

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EOA 500 SPRAY-APPLIED POLYURETHANE FOAM PLASTIC INSULATION

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that EOA 500 spray-applied polyurethane foam plastic insulation, described in ICC-ES evaluation report ESR-3686, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 and 2017 *Florida Building Code—Building*
- 2020 and 2017 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The EOA 500 spray-applied polyurethane foam plastic insulation, described in Sections 2.0 through 7.0 of the evaluation report ESR-3686, complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2018 and 2015 *International Building Code*® (IBC) and 2018 and 2015 *International Residential Code*® (IRC) provisions noted in the evaluation report under the following condition:

Installation must meet the requirements of Sections 1403.8 and 2603.8 of the *Florida Building Code—Building* and Sections R318.7 and R318.8 of the *Florida Building Code—Residential*, as applicable.

Use of the EOA 500 spray-applied polyurethane foam plastic insulation has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued April 2022.