



ICC-ES Evaluation Report

ESR-5255

Issued November 2023

Revised October 2024

This report is subject to renewal November 2024.

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

REPORT HOLDER:

CREATIVE POLYMER SOLUTIONS, LLC

EVALUATION SUBJECT:

ACCUFOAM AF1 SPRAY FOAM INSULATION

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015, and 2012 *International Residential Code*® (IRC)
- 2021, 2018, 2015, and 2012 *International Energy Conservation Code*® (IECC)

Properties evaluated:

- Surface-burning characteristics
- Physical Properties
- Thermal Resistance
- Air permeability
- Attic and Crawl Space Installation
- Exterior Walls of Types I-IV Construction

2.0 USES

Accufoam AF1 is an open cell, low density two-component spray foam insulation and is used as a nonstructural thermal insulating material in all types of construction under the IBC and in dwellings under the IRC. The insulation is intended for use in wall cavities, floor/ceiling assemblies, or attics and crawl spaces when installed in accordance with Section 4.4. See Section 4.5 for use in exterior walls of Type I, II, III, and IV construction.

Under the IRC and 2021, 2018, and 2015 IBC, Accufoam AF1 insulation may be used as air-impermeable insulation when installed in accordance with Section 3.4.

3.0 DESCRIPTION

3.1 General:

Accufoam AF1 is a low density, spray-applied polyurethane foam plastic insulation installed as a component of wall assemblies, ceilings, floors, crawlspaces and attics and cavities of roofs. The foam plastic is a two-component, open-cell spray foam system with a nominal density of 0.5 pcf (16 kg/m³).

Accufoam AF1 insulation is produced in the field by combining a polymeric isocyanate (A component) with a polymeric resin blend (B component). The insulation components have a shelf life of six months when stored in factory-sealed containers at temperatures between 60°F (16°C) and 90°F (32°C).

3.2 Surface-burning Characteristics:

Accufoam AF1 spray foam plastic insulation at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf (8.0 kg/m³) 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. There is no thickness limitation when installed behind a code-prescribed thermal barrier, except as noted in Section 4.3.2 and Table 2.

3.3 Thermal Resistance (R-Values):

Accufoam AF1 spray foam plastic insulation has a thermal resistance (R-value), at a mean temperature of 75°F (24°C), as shown in Table 1.

3.4 Air Permeability

Accufoam AF1 spray-applied foam plastic insulation is considered air-impermeable insulation (less than 0.02 L/s-m² at 75 Pa) in accordance with 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) and IRC Sections R202 and R806.5, at a minimum of 4 inches (102 mm) based on testing in accordance with ASTM E2178.

3.5 Intumescent Coatings:

3.5.1 DC315 Coating: DC 315 coating (ESR-3702), manufactured by International Fireproof Technology, Inc. is a water-based, liquid applied intumescent coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating material has a shelf life of one (1) year when stored in factory-sealed containers at temperatures between 50°F and 80°F (10°C and 27°C).

3.5.2 FS-IB™ Ignition Barrier Coating: FS-IB™ Ignition Barrier Coating, manufactured by Flame Seal LLC, is a proprietary single-component, water-based acrylic coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf-life of six (6) months when stored in factory-sealed containers at temperatures between 60°F and 80°F (16°C and 27°C).

4.0 DESIGN AND INSTALLATION

4.1 General:

Accufoam AF1 spray foam plastic insulation must be installed in accordance with the report holder's published installation instruction and this report. A copy of the report holder's published installation instructions must be available at all times on the jobsite during installation.

4.2 Application:

Accufoam AF1 spray foam plastic insulation must be applied on the jobsite using a volumetric positive displacement pump in accordance with the manufacturer's published installation instructions. The foam plastic must not be sprayed onto a substrate that is wet, or covered with frost or ice, loose scales, rust, oil or grease. The foam plastic insulation must not be used in electrical outlet or junction boxes or in contact with rain or water and must be protected from the weather during and after application.

Accufoam AF1 shall be sprayed in multiple passes having a maximum thickness of 6 inches (152 mm) per pass up to the maximum insulation thickness specified in this report.

The insulation must be used in areas where the maximum service temperature is no greater than 180°F (82°C). The insulation must be applied when the temperature is at or above 15°F (-9°C) and be protected from the weather during and after application.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier:

Accufoam AF1 foam plastic insulation must be separated from the interior of the building by an approved thermal barrier, such as ½-inch (12.7 mm) gypsum wallboard or an equivalent thermal barrier in accordance with IBC Section 2603.4 or IRC Section R316.4, as applicable. When installation is within an attic or crawl space as described in Section 4.4, a thermal barrier is not required between the foam plastic and the attic or crawl space, but is required between the foam plastic insulation and the interior of the building. There is no thickness limitation when installed behind a code-prescribed thermal barrier, except as noted in Section 4.3.2.

4.3.2 Application without a Prescriptive Thermal Barrier:

Accufoam AF1 foam plastic insulation may be installed without a prescriptive thermal barrier described in Section 4.3.1, when installation is in accordance with the following requirements:

- The insulation must be covered on all surfaces with a fire protective coating at the minimum thickness set forth in Table 2.
- The maximum installed thickness of the insulation must not exceed the thicknesses set forth in Table 2.
- The coating must be applied over the insulation in accordance with the coating manufacturer's instructions and this report.

4.4 Ignition Barrier - Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier:

When Accufoam AF1 foam plastic 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 and 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. The attic or crawl space area must be separated from the interior of the building by an approved thermal barrier as described in Section 4.3.1. Accufoam AF1 may be installed in unvented attics under the conditions prescribed in 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or IRC Section R806.5, as applicable.

4.4.2 Application without a Prescriptive Ignition Barrier:

Accufoam AF1 foam plastic insulation may be installed in attics and crawl spaces without a prescriptive ignition barrier as described in IBC Section 2603.4.1.6 and IRC Section R316.5.3 and R316, when all of the following conditions apply:

1. Entry to the attic or crawl space is only for service of utilities and no storage is permitted.
2. There are no interconnected attic, crawl space areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Combustion air is provided in accordance with IMC Section 701.
5. Attic ventilation is provided when required by 2021 and 2018 IBC Section 1202.2 (2015 and 2012 IBC Section 1203.2) or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) or 2012 IRC Section R806.5, as applicable.
6. Under-floor (crawl space) ventilation is provided when required by 2021 and 2018 IBC Section 1202.4 (2015 IBC Section 1203.4 or 2012 IBC Section 1203.3) or IRC Section R408.1, as applicable.
7. If hot work is to be performed, all necessary procedures, precautions and limitations must be observed in accordance with OSHA 1926 Subpart J Standard 1926.352 requirements for hot work (welding / cutting) performed in the vicinity of combustible materials.
8. An installation certificate with the following information must be posted at each entrance:
 - a. Product name and installation thickness.
 - b. Manufacturer name, address and contact information.
 - c. Attestation that the product(s) have been installed in accordance with the manufacturer's installation instructions and the requirements of the evaluation report.
 - d. A notice that the certificate is not to be removed or altered.
 - e. A list of limitations for the space including the following:
 - Entry to the space is only to service utilities, and no storage is permitted.
 - FIRE SAFETY WARNING: If hot work is to be performed, all necessary procedures, precautions and limitations must be observed in accordance with OSHA 1926 Subpart J Standard 1926.352 requirements for hot work (welding / cutting) performed in the vicinity of combustible materials.

In attics, Accufoam AF1 may be spray-applied to the underside of roof sheathing and/or rafters, and/or to vertical surfaces; and in crawl spaces, the insulations may be spray-applied to the underside of floors and/or vertical surfaces.

The thickness of the foam plastic applied to the underside of the overhead surfaces and vertical surfaces shall not exceed the values in Table 3. Insulation must be covered on all surfaces with a fire protective coating at the minimum thickness set forth in Table 3. Insulation surfaces to be coated must be dry and clean, and free of dirt, loose debris and any other substances that could interfere with adhesion of the coating. The attic or crawl space must be separated from the interior of the building by an approved thermal barrier as described in Section 4.3.1.

4.4.3 Unvented Attics: Accufoam AF1 spray foam insulation, at the minimum thickness specified in Section 3.4 for air-impermeable insulation, may be installed in unvented attic assemblies and unvented enclosed rafter assemblies in accordance with 2021 and 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) and IRC Section R806.5 as applicable.

4.5 Use in Exterior Walls of Types I, II, III, and IV Construction (IBC)

4.5.1 General: When used on exterior walls of Types I, II, III or IV construction, the assembly must comply with IBC Section 2603.5 and this section. Accufoam AF1 must be installed at a maximum thickness of 6 inches (152mm). The potential heat of Accufoam AF1 is 564.4 Btu/ft² (6.41 MJ/m²) per inch of thickness, when tested in accordance with NFPA 259. The foam plastic insulations are used in exterior walls of Types I, II, III, or IV construction of any height, the insulation shall comply with IBC Section 2603.5. Walls required to be fire-resistance rated construction are beyond the scope of this report and shall comply with IBC Section 2603.5.1.

4.5.2 Complying Exterior Wall Assemblies: Accufoam AF1 must be installed at the maximum thickness described in Tables 4 and 5. Wall assemblies that comply with Section 2603.5 of the IBC and this report that may be used in exterior walls of buildings of Type I, II, III, or IV construction of any height are described in Tables 4 and 5 of this report.

5.0 CONDITIONS OF USE

The Accufoam AF1 spray 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** This evaluation report and the manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application.
- 5.2** The insulation must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. If there is a conflict between the installation instructions and this report, this report governs.
- 5.3** 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 installation is as described in Section 4.3.2.
- 5.4** The insulation must not exceed the thicknesses and densities noted in this report.
- 5.5** The insulation must be applied by licensed dealers and installers certified by Creative Polymer Solutions.
- 5.6** Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2021, 2018 and 2015 IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4, as applicable.
- 5.7** Jobsite certification and labeling of the insulation must comply with 2021, 2018, 2015 IRC Sections N1101.10.1 and N1101.10.1.1 (2012 IRC Sections

N1101.12.1 and N1101.12.1.1) and IECC Sections C303.1.1, C303.1.1.1, R303.1.1 and R303.1.1.1, as applicable.

- 5.8** When installed in accordance with Section 4.4.2 of this report, the associated installation certificate(s) containing the required information referenced in Section 4.4.2 must be installed at each entrance to the crawlspace or attic, as applicable. The certificate(s) must be red in color and constructed of durable materials, such as metal, plastic, or laminated paper.
- 5.9** When used in unvented attics in accordance with Section 4.4.3 of this report, installation with a vapor diffusion port in accordance with 2021 IBC Section 1202.3, Item 5.2 or 2021 and 2018 IRC Section R806.5, Item 5.2 is outside the scope of this report.
- 5.10** A vapor retarder must be installed in accordance with the applicable code.
- 5.11** Accufoam AF1 spray foam plastic insulation is manufactured in Birmingham, Alabama 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 June 2023.
- 6.2** Reports of tests in accordance with AC377, Appendix X.
- 6.3** Reports of room corner fire testing in accordance with NFPA 286
- 6.4** Reports of air permeance testing in accordance with ASTM E2178.
- 6.5** Reports of testing in accordance with NFPA 259.
- 6.6** Reports of fire testing in accordance with NFPA 285 and related engineering analysis.

7.0 IDENTIFICATION

- 7.1** The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5255) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2** All packages and containers of Accufoam AF1 spray foam plastic insulation must be labeled with Creative Polymer Solutions, LLC name and address, component designation (A or B); the flame spread index and the smoke-developed index; the expiration date; and the name of the inspection body (ICC-ES).
- 7.3** International Fireproof Technology, Inc. DC315 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 the ICC-ES evaluation report number (ESR-3702).
- 7.4** Flame Seal Products, Inc. Ignition Barrier FS-IB™ is labeled with the manufacturer's name, the product name, the date of manufacture, the shelf life or expiration date, and the manufacturer's instructions for application.
- 7.5** The report holder's contact information is the following:

CREATIVE POLYMER SOLUTIONS, LLC
2720 SOUTHEASTERN CIRCLE
BIRMINGHAM, AL 35215
(205) 440-4996
www.creativepolymer.com

Table 1 – Thermal Resistance (R-Values)

Thermal Resistance (R-Value)	
Thickness (inch)	Accufoam AF1 R-Value (°F·ft ² ·h/BTU)
1	3.7
2	7.3
3	11
3.5	13
4	14
5	18
5.5	20
6	22
7	25
7.5	27
8	29
9	32
10	36
11	40
12	43
13	47
14	50
15	54
16	58
17	61
18	65

For SI: 1 inch = 25.4 mm, 1°F·ft²·h/BTU=0.176 110°K·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 down to the nearest whole number.

Table 2 – USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER¹

Spray Foam Insulation	Fire Protective Coating/Covering			Maximum SPF Thickness (inch)		Test Method
	Type	Minimum Thickness (mils)	Minimum Application Rate	Walls and Vertical Surfaces	Ceiling and Overhead Surfaces	
Accufoam AF1	DC315 ²	18 WFT (12 DFT)	1.1 gal/100 ft ²	8	14	NFPA 286

For SI: 1 inch = 25.4 mm, 1 mill = 0.0254mm, 1 gallon – 3.785 L, 1 ft² = 0.0929 m²

¹Fire-protective coatings and coverings shall be applied over all exposed SPF surfaces in accordance with the coating/covering manufacturer’s instructions and this report.

²International Fireproof Technology Inc. recognized in ESR-3702.

Table 3 – ATTIC OR CRAWL SPACE ASSEMBLIES WITHOUT A PRESCRIPTIVE IGNITION BARRIER¹

Spray Foam Insulation	Fire Protective Coating/Covering			Maximum SPF Thickness (inch)		Test Method
	Type	Minimum Thickness (mils)	Minimum Application Rate	Walls and Vertical Surfaces	Ceiling and Overhead Surfaces	
Accufoam AF1	DC315 ²	4 WFT (3 DFT)	0.25 gal/100 ft ²	8	14	ICC-ES AC377 Appendix X
Accufoam AF1	FS-IB ³	6 WFT (3 DFT)	0.43 gal/100 ft ²	10	15	ICC-ES AC377 Appendix X

For SI: 1 inch = 25.4 mm, 1 mill = 0.0254mm, 1 gallon – 3.785 L, 1 ft² = 0.0929 m²

¹Fire-protective coatings and coverings shall be applied over all exposed SPF surfaces in accordance with the coating/covering manufacturer’s instructions and this report.

²International Fireproof Technology, Inc. recognized in ESR-3702

³Flame Seal Products, Inc., See Section 3.5.2 of this report

Table 4 NFPA 285 Complying Exterior Wall Assemblies, Accufoam AF1 Applied in Wall Stud Cavity

Wall Component	Material Description
Base Wall (BWS)	Steel Stud Wall – 1 layer of 5/8-inch minimum Type X gypsum wallboard installed on the interior side of minimum 3 5/8-inch deep minimum to 6-inch-deep maximum No. 20 gauge steel studs spaced a maximum of 24 inches on center.
Fire-Stopping in Stud Cavity at Floor Lines	4-inch 4 pcf mineral wool (friction fit or installed with Z-clips)
Cavity Insulation	Accufoam AF1 - 1 5/8 inches minimum to 6 inches maximum with a maximum 2-inch air gap for studs ranging from 3 5/8-inch deep minimum to 6-inch-deep maximum.
Exterior Sheathing	Minimum 5/8-inch-thick exterior gypsum sheathing.
Water-resistive Barrier over Base Wall (use either 1, or 2)	1) None. 2) Any WRB or alternative vapor barrier that has been approved to be used in a NFPA 285 compliant assembly paired with mineral wool, polyisocyanurate, EPS or XPS insulation or no exterior insulation for claddings approved for that WRB by an approved evaluation or certification entity.
Exterior Insulation (use either 1, 2, or 3)	1) None – only where the cladding is listed to be approved with specific water-resistant barrier (WRB). (See Note 1) 2) 2-inch thick minimum 4 pcf mineral fiber insulation allowed for use with any WRB on the base wall surface. (See Note 1) 3) Any polyisocyanurate, EPS or XPS insulation that has been approved (see note 2) to be used in an NFPA 285 compliant assembly paired with the WRBs in Item 2 above and claddings in Item 2 below. (See Note 2)
Exterior Cladding (use either 1, or 2)	1) Claddings below may only be used with noncombustible exterior insulation in Item 2 above (mineral fiber) a) Any noncombustible cladding, such as brick, stone, terra cotta, fiber cement, concrete, sheet metal, etc. b) Combustible cladding – Use any cladding that has been successfully tested by the panel manufacturer (or fabricator) via the NFPA 285 test method. (See Note 2) 2) Claddings below may be used with any approved combustible insulation in Exterior Insulation Item 3 above. a) Any cladding (combustible or noncombustible) that has been approved to be used in an NFPA 285 compliant assembly paired with approved polyisocyanurate, EPS, XPS, or SPF insulation. Each insulation must be specifically approved for the exact cladding types listed in the approval. (See Note 2)
Window/Door Perimeters	Windows and doors shall be framed as required for the base wall. The exterior side of the base wall shall use design for specific system being considered. (See Note 1) Note: EPS and XPS require specific door/window header and jamb details to be compliant to NFPA 285. Polyisocyanurate and spray foam may require specific header/jamb details. Approvals shall be from an approved evaluation or certification entity for the header jamb detail required for each insulation type.

For SI: 1 inch = 25.4 mm

Note 1 Examples for use with no exterior insulation or with mineral wool insulation per table above

1. Any combustible cladding that has passed NFPA 285 testing (examples below)
 - a. NFPA 285 approved MCM/ACM metal/Aluminum Composite building panels.
 - b. NFPA 285 approved stone/aluminum honeycomb composite.
 - c. NFPA 285 approved HPL High Pressure Laminate Panels.
2. Any noncombustible cladding such as (but not limited to):
 - a. Brick – Nominal 4-inch (102 mm) clay brick or veneer with a maximum 2-inch (51 mm) air gap behind the brick. Brick Ties/Anchors 24 inches (610 mm) o.c. (maximum).
 - b. Stucco – 3/4-inch (19.1 mm) exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the insulation and lath. The secondary WRB may not be full coverage asphalt or butyl based self-adhering membranes.
 - c. Natural Stone (granite, limestone marble, sandstone) – 2 inch (51 mm) using any installation technique with a 2-inch (51 mm) air gap (max).
 - d. Artificial Cast Stone – 1 1/2 - inch (38.1 mm) using any installation technique with a 2-inch (51 mm) air gap (max).
 - e. Terra Cotta Cladding – 1 1/4 - inch (32 mm) using any installation technique with a 2-inch (51 mm) air gap (max).
 - f. 1/4 - inch (6.4 mm) (min) fiber cement panels (installed per manufacturer instructions)
 - g. Concrete – 2 inches (51 mm) thick with a 2-inch (51 mm) air gap (max)
 - h. CMU blocks – 4 inches (102 mm) thick with a maximum 2-inch (51 mm) air gap.
 - i. Sheet metals such as aluminum copper or zinc – any thickness

Note 2: If the base wall is covered with a combustible WRB/insulation and various claddings (combustible or noncombustible) each insulation/WRB/cladding combination allowed must have explicitly been tested or approved to be used with each other by an approved evaluation or certification entity.

Table 5 NFPA 285 Complying Exterior Wall Assemblies, Masonry for Walls with Accufoam CC Exterior Insulation and/or Accufoam AF1 Applied in Wall Stud Cavity¹

Wall Component	Material Description
Base Wall (BWS) (Use either 1, 2, or 3)	1) Concrete Wall 2) Concrete Masonry Wall 3) Steel Stud Wall – 1 layer of 5/8-inch minimum Type X gypsum wallboard installed on the interior side of minimum 3 5/8-inch deep to 6-inch-deep maximum No. 20 gauge steel studs spaced a maximum of 24 inches on center.
Fire-Stopping in Stud Cavity at Floor Lines	4-inch 4 pcf mineral wool (friction fit or installed with Z-clips)
Cavity Insulation (Use either 1, 2, 3, 4 or 5)	1) None 2) Accufoam AF1 1 5/8 inches minimum to 6 inches maximum thickness with a maximum 2-inch air gap for studs ranging from 3 3/8 -inch deep minimum to 6-inch-deep maximum. 3) Any noncombustible insulation per ASTM E136 4) Any mineral Fiber (faced or unfaced) 5) Any fiberglass batt (faced or unfaced)
Exterior Sheathing	Minimum 1/2 -inch-thick exterior gypsum sheathing.
Exterior Insulation	4-inch maximum thickness of Accufoam CC ²
Exterior Cladding (Use either 1, 2, 3, 4, 5, 6 or 7)	1) Brick – Standard type brick veneer anchors, installed a maximum of 24 inches on center, vertically on each stud with maximum 1-inch air gap between exterior insulation and brick. Brick to be standard nominal 4-inch-thick clay brick installed in a running bond pattern using Type S mortar. 2) Stucco – Minimum 3/4-inch thick, exterior plaster and lath. A secondary water resistive barrier (WRB) can be installed between the exterior insulation and lath. The secondary WRB shall not be full coverage asphalt or butyl based self-adhered membranes. 3) Minimum 2-inch-thick natural stone (granite, limestone, marble or sandstone). Any standard non-open joint installation technique shall be used. 4) Artificial cast stone – 1 1/2 -inch minimum using any standard non-open joint installation technique. 5) Terra Cotta Cladding – 1 1/4 -inch minimum using any standard non-open joint installation technique. 6) Concrete – 2 inches thick with a maximum 2-inch air gap any standard non-open joint installation technique. 7) CMU Blocks – 4 inches minimum with a maximum 2-inch air gap any standard non-open joint installation technique.
Window/Door Perimeters	Framed as required for base wall. Use 25 gauge sheet steel for flashing area outside of base wall.

For SI: 1 inch = 25.4 mm

¹When used on exterior walls of Types I, II, III, or IV construction, the specific wall assembly must comply with IBC Section 2603.5

²Accufoam CC recognized in ESR-5253