



ICC-ES Evaluation Report

ESR-2298

Reissued May 2023

Revised November 2023

This report is subject to renewal May 2024.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 57 00—Coated Foam Roofing

REPORT HOLDER:

BASF CORPORATION

EVALUATION SUBJECT:

BASF CORPORATION COATED FOAM PLASTIC ROOF COVERINGS: SKYTITE® C2 SERIES AND SKYTITE® C3 SERIES

ADDITIONAL LISTEE:

GAF

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Physical properties
- Fire classification
- Wind resistance
- Impact resistance
- Elimination of thermal barrier (roofing)

2.0 USES

The coated foam plastic roof coverings described in this report are used in construction of classified roof assemblies, as noted in Tables 1 and 2. The roof covering systems recognized in this report may be used on buildings of any type of construction.

3.0 DESCRIPTION

3.1 General:

BASF Corporation SKYTITE® C2 Series coated foam plastic roof coverings consist of liquid-applied coatings over SKYTITE® C2-2.5, SKYTITE® C2-2.8 or SKYTITE® C2-3.0 spray-applied polyurethane foam plastic insulations.

BASF Corporation SKYTITE® Series coated foam plastic roof coverings consist of liquid-applied coatings over SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0 spray-applied polyurethane foam plastic insulations.

3.2 Spray Polyurethane Foam Plastic Insulation:

3.2.1 General: SKYTITE® C2-2.5, SKYTITE® C2-2.8 and SKYTITE® C2-3.0 and SKYTITE® C3-2.5, SKYTITE® C3-2.8 and SKYTITE® C3-3.0 are two-component, spray-applied, foam plastic insulations complying with ASTM C1029–Type III, and are produced in densities of 2.5, 2.8 and 3.0 pcf (40.0, 44.8 and 48.0 kg/m³), respectively. The foam plastic ingredients (Component A and Component B) are available in 55-gallon (208 L) drums and have a shelf life of twelve months for Component A and five months for Component B (except “S” reactivities) when stored at temperatures between 50°F and 80°F (10°C and 26.7°C).

3.2.2 Surface-burning Characteristics: The SKYTITE® C2 Series foam plastic insulations have a flame-spread rating of 75 or less when tested in accordance with ASTM E84 or UL723 at a maximum thickness of 3.0 inches (76 mm). SKYTITE® C3 Series foam plastic insulations have a flame-spread rating of 75 or less when tested in accordance with ASTM E84 or UL 723 at a maximum thickness of 2.0 inches (51 mm).

3.3 Coatings:

3.3.1 General: The coatings described in this report for use in the BASF Corporation roofing systems are GAF Diathon® roof coating and BASF Skytite A-1000 acrylic roof coating.

3.3.2 GAF Diathon® Acrylic Top Coat: Diathon® coating is a single-component, liquid-applied, 100 percent acrylic elastomeric coating, produced by GAF. It is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of 24 months when stored at temperatures between 50°F and 80°F (10°C and 26.7°C). The Diathon® coating complies with ASTM D6083.

3.3.3 BASF Skytite A-1000 Acrylic Roof Coating: BASF Skytite A-1000 coating is a single-component, liquid-applied, 100 percent acrylic elastomeric coating. It is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of 24 months when stored at temperatures between 50°F and 80°F (10°C and 26.7°C). The BASF Skytite A-1000 coating complies with ASTM D6083.

3.4 Impact and Foot Traffic Resistance:

The coated foam plastic roof coverings described in this report comply with the Resistance to Foot Traffic Test in Section 4.6 of FM 4470.

4.0 INSTALLATION

4.1 Preparation of Substrates:

The substrates to be covered must be free of all grease, oil, loose particles, moisture, and other foreign materials. Areas not receiving a foam plastic insulation application must be masked off or otherwise protected from overspray. The application of primers, when used, must be in accordance with the spray foam roofing manufacturer's installation instructions.

4.2 Roof Deck Substrates:

4.2.1 Combustible Substrates: Combustible substrates must be minimum ¹⁵/₃₂-inch-thick (11.9 mm), code-complying, exterior-grade or Exposure 1 plywood (US DOC PS1). All plywood edges must be supported in accordance with the requirements set forth in IBC Section 2603.4.1.5.

4.2.2 Noncombustible Substrates:

4.2.2.1 Cementitious Substrates: Structural concrete substrates must have a minimum compressive strength of 2500 psi (17,237 kPa). Cementitious decks must be thoroughly cured and must be subjected to specialized treatment, such as wire brushing or commercial sandblasting, or must be chemically cleaned to ensure adequate bonding.

4.2.2.2 Metal Substrates: Minimum No. 22 gauge galvanized steel [0.030 inch (0.76 mm)] deck. Metal decks must be cleaned of any adhesion inhibitors, and gaps in end or sidelaps must be sealed with an approved sealant.

4.3 Roof Slope:

The polyurethane foam plastic insulation must be spray-applied to form roof slopes that have a minimum slope of ¹/₄:12 (2 percent) and a maximum roof slope as specified in Tables 1 and 2.

4.4 Foam Plastic Insulation Application:

The polyurethane foam plastic insulations described in Section 3.2 are applied at a 1:1 ratio by volume of the A and B components to one of the substrates described in Section 4.2, using foam-spraying equipment and processing parameters recommended by BASF Corporation. Application of the foam plastic insulation must be performed when the following conditions are met:

- Substrate temperature is at least 50°F (10°C);
- Ambient temperature is at least 50°F (10°C);
- Relative Humidity is below 85% RH;
- Dew point is more than 5°F (2.8°C) above or below the ambient temperature;
- Wind speed is equal to or less than 15 miles per hour (24.1 km/h). Wind barriers are needed when the wind speed is greater than 15 miles per hour (24.1 km/h).

When conditions are outside the parameters noted above, consult BASF Corporation for additional guidance prior to installation.

The foam plastic insulation must not be applied to wet or damp substrates, or when dew, condensation, precipitation, or freezing temperatures are expected prior to completion of the foam and coating application.

Foam plastic is applied in maximum 2-inch-thick (51 mm) passes, to reach the desired thickness as noted in Tables 1 and 2. The total finished thickness must be achieved within

the same day. The finished surface of the foam must be smooth and free of voids, pinholes and crevices.

4.5 Application of Coating:

The foam plastic insulation surface must be dry and free of all damaged foam, dirt and foreign material before application of the coating. If the insulation surface is damaged to the point where cracks, voids or large depressions appear, additional insulation must be applied to create a satisfactory surface. After the insulation has developed sufficient strength to support foot traffic, but within 72 hours, the coating must be brush-, roller-, or spray-applied at the application rates noted in Table 1. The ambient temperature must be at least 50°F (10°C) during coating application, and above 32°F (0°C) for the 24-hour period after application. The coating must not be applied when dew, condensation, precipitation or freezing temperatures are anticipated prior to completion of the coating application. The application of primers, when used, must be in accordance with the spray foam roofing manufacturer's installation instructions.

4.6 Thermal Barrier:

The classified roof assemblies noted in Tables 1 containing SKYTITE® C2 Series and SKYTITE® C3 Series foam plastic insulations may be used without a thermal barrier based on testing in accordance with UL 1256, as set forth in IBC Section 2603.4.1.5.

4.7 Fire Classification:

4.7.1 New Construction: Roof covering systems, as noted in Tables 1, when installed in accordance with this report, are Class A, Class B or Class C roof coverings in accordance with ASTM E108 or UL 790.

4.7.2 Reroofing: Prior to installation of new roof coverings, inspection in accordance with 2018 and 2015 IBC Section 1511 or 2012 and 2009 IBC Section 1510, and approval from the code official having jurisdiction, are required. Installation must be over uninsulated systems only.

4.8 Wind Resistance:

The allowable wind uplift pressures for the coated foam plastic roof coverings are noted in Table 2.

5.0 CONDITIONS OF USE

The SKYTITE® C2 Series and SKYTITE® C3 Series coated foam plastic roof coverings described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1** Installation and application of the coated foam plastic roof coverings must comply with the code, the report holder's published installation instructions, and this report. If there are any conflicts between the report holder's installation instructions and this report, this report governs.
- 5.2** The spray-applied foam roofing insulation must be applied by installers trained or approved by BASF Corporation or trained by the Spray Polyurethane Foam Alliance.
- 5.3** Where moderate or heavy foot traffic occurs for maintenance of equipment, or is otherwise necessary, the roof covering must be adequately protected to prevent damage or wearing of the surface.
- 5.4** Foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4, except as noted in Section 4.6.

- 5.5 The allowable wind uplift pressures listed in Table 2 are for the roof covering only. The deck and supporting structure to which the roof covering is attached must be designed to withstand the applicable wind pressures determined in accordance with ASCE 7.
- 5.6 Flashing must be installed at wall and roof intersections, at gutters and around roof openings, as required by IBC Section 1503.2.
- 5.7 The evaluation of the foam plastic insulation as a vapor retarder is outside the scope of this report.
- 5.8 The BASF polyurethane foam plastic insulation components are manufactured in Houston, Texas, Orange, California and Toronto, Ontario, Canada under a quality control program with inspections by ICC-ES. The BASF and GAF roof coatings are manufactured in Phoenix, Arizona, under quality control programs 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 2023.
- 6.2 Reports of tests on GAF Diathon® and BASF FECoat 1000 in accordance with ASTM D6083.
- 6.3 Reports of resistance to foot traffic testing in accordance with Section 4.6 of FM 4470.
- 6.4 Reports of tests in accordance with ASTM E108 (UL 790).
- 6.5 Reports of tests in accordance with ASTM E84 (UL 723)
- 6.6 Reports of tests in accordance with UL 1256.

7.0 IDENTIFICATION

- 7.1 Each container of polyurethane foam plastic insulation bears a label with the BASF Corporation, name and address; the product name (SKYTITE® C2 Series or SKYTITE® C3); the component type [A (Isocyanate) or B (Resin)]; the density (Component B only); the flame-spread index; mixing instructions, the evaluation report number (ESR-2298), the shelf life; and the date of manufacture.

Each container of Diathon® acrylic roof coating is labeled with the GAF name, the product name (Diathon®), the date of manufacture, the shelf life, and the evaluation report number (ESR-2298).

Each container of Skytite A-1000 acrylic roof coating is labeled with the BASF Corporation, name; the product name (Skytite A-1000); the date of manufacture; the shelf life; and the evaluation report number (ESR-2298).

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

BASF CORPORATION
1703 CROSSPOINT AVENUE
HOUSTON, TEXAS 77054
(888) 900-FOAM (3626)
www.spf.basf.com

- 7.3 The additional listee's contact information is the following:

GAF
2810 SOUTH 18TH PLACE
PHOENIX, ARIZONA 85034

TABLE 1—FIRE CLASSIFICATION—COATED FOAM ROOF ASSEMBLIES

SYSTEM NO.	FIRE CLASSIFICATION	ROOF DECK SUBSTRATE ^{1,2,3}	MAXIMUM ROOF SLOPE	SPRAY-APPLIED FOAM PLASTIC INSULATION ^{4,5}		COATING		TOP SURFACING
				Designation	Thickness (inches)	Designation	Application Rate	
1F	A	Non-Combustible	1:12	SKYTITE® C2-2.5, SKYTITE® C2-2.8 or SKYTITE® C2-3.0	1 to 3	Diathon® or Skytite A-1000	Two coats at 1½ gallons per 100 ft² per coat	Granules, 40 pounds per 100 ft² (Optional)
2F	A	Non-Combustible	3:12	SKYTITE® C2-2.5, SKYTITE® C2-2.8 or SKYTITE® C2-3.0	1 to 3	Diathon® or Skytite A-1000	Two coats at 1¾ gallons per 100 ft² per coat	Granules, 40 pounds per 100 ft² and sealed with an application of Diathon® at ½ gallons per 100 ft²
3F				SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0	1 to 2			
4F	A	Non-Combustible	1¼:12	SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0	1 to 2	Diathon® or Skytite A-1000	Two coats at 1½ gallons per 100 ft² per coat	Granules, 40 pounds per 100 ft² (Optional)
5F	A	Combustible	Unlimited	SKYTITE® C2-2.5, SKYTITE® C2-2.8 or SKYTITE® C2-3.0	1 to 3	Diathon® or Skytite A-1000	Two coats at 1½ gallons per 100 ft² per coat	No. 6 crushed limestone at 64 pounds per 100 ft² embedded into wet coating, followed by 40 pounds mix of dry mix. 4½ gallons of water and ½ gallon of coating acrylic resin with ¾ oz. of Colloid 60 applied at one 100 ft²
6F				SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0	1 to 2			
7F	B	Combustible	½:12	SKYTITE® C2-2.5, SKYTITE® C2-2.8 or SKYTITE® C2-3.0	1½ to 3	Diathon® or Skytite A-1000	Two coats at 1¼ gallons per 100 ft² per coat	No. 11 granules, 30 pounds per 100 ft² covered with Diathon® applied at ¼ gal per 100 ft²
8F	B	Combustible	½:12				Two coats at 1¾ gallons per 100 ft² per coat	Granules, 40 pounds per 100 ft² and sealed with and application of Diathon® at ½ gallons per 100 ft²
9F							Base coat at 1¼ gallons per 100 ft² and top coat at 1½ gallons per 100 ft²	Granules, 30 pounds per 100 ft² and sealed with and application of Diathon® at ¼ gallons per 100 ft²
10F	B	Combustible	½:12	SKYTITE® C2-2.5, SKYTITE® C2-2.8 or SKYTITE® C2-3.0	1½ to 3	Diathon® or Skytite A-1000	Two coats at 1¾ gallons per 100 ft² per coat	Granules, 40 pounds per 100 ft² and application of Diathon® at ½ gallons per 100 ft²
11F				SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0	1½ to 2			
12F	B	Combustible	½:12	SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0	1½ to 2	Diathon® or Skytite A-1000	Two coats at 1¾ gallons per 100 ft² per coat	No. 11 granules, 40 pounds per 100 ft² covered with Diathon® applied at ¼ gal per 100 ft²
13F	B	Combustible	½:12	SKYTITE® C2-2.5, SKYTITE® C2-2.8, SKYTITE® C2-3.0,	1½ to 3	Diathon® or Skytite A-1000	Two coats at 1½ gallons per 100 ft² per coat	No. 11 granules, 40 pounds per 100 ft²
14F				SKYTITE® C3-2.5, SKYTITE® C3-2.8 or SKYTITE® C3-3.0	1½ to 2			

For SI: 1 inch = 25.4 mm; 1 gallon per 100 square feet = 0.41 L/m²; 1 gallon = 3.785 L; 1 ft² = 0.0929 m².

¹Roof deck must be either minimum 15/32-inch-thick (11.9 mm) plywood, minimum No. 22 gage galvanized steel [0.030 inch (76 mm)] or concrete with a minimum compressive strength of 2500 psi as specified in Section 4.2.

²Noncombustible deck classifications are applicable for use over combustible decks (min. 15/32-inch-thick plywood) when minimum 1/4-inch-thick G-P Gypsum Corporation DensDeck® Roof Board is used directly over the combustible deck with all joints staggered a minimum of 6 inches from plywood joints.

³Unless otherwise noted, noncombustible substrates include concrete and steel decks as described in Section 4.2.2 of this report.

⁴All foam plastic insulation must be UL classified foam plastic and must be limited to the maximum thickness specified for the applicable system. Any foam plastic insulation, where used, must bear the label of an approved agency indicating that the foam plastic has a flame-spread index of not more than 75 when tested at the maximum thickness intended for use in accordance with ASTM E84 (UL723), subject to the approval of the code official.

⁵Foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2303.4.1.5, except as described in Section 4.6 of this report.

TABLE 2—WIND RESISTANCE—COATED FOAM ROOF COVERINGS¹

SYSTEM NO.	ALLOWABLE WIND UPLIFT (psf)	SUBSTRATE	FOAM PLASTIC INSULATION	
			DESIGNATION	THICKNESS (inches)
1W	240	¹⁵ / ₃₂ -inch APA rated plywood	SKYTITE® C3	1 (Minimum)

For SI: 1 inch = 25.4 mm; 1 psf = 4.882 kg/m².

¹Coating must be one of the following:

- (a) GAF Diathon® applied in two coats at 1½ gallons per 100 ft² per coat.
- (b) BASF Skytite A-1000 Series applied in two coats at 1½ gallons per 100 ft² per coat.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 57 00—Coated Foam Roofing

REPORT HOLDER:

BASF CORPORATION

EVALUATION SUBJECT:

BASF CORPORATION COATED FOAM PLASTIC ROOF COVERINGS: SKYTITE® C2 SERIES AND SKYTITE® C3 SERIES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the BASF Corporation Foam Plastic Roof Coverings, described in ICC-ES evaluation report ESR-2298, have also been evaluated for the code noted below.

Applicable code edition:

2022 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of the State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS

2.1 CBC:

The BASF Corporation Foam Plastic Roof Coverings, described in Sections 2.0 through 7.0 of the evaluation report ESR-2298, comply with the CBC, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued May 2023 and revised November 2023.