ICC-ES Evaluation Report

ESR-3916

Reissued September 2024

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This report also contains:

- CBC Supplement

- FBC Supplement

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DIVISION: 07 00 00 — THERMAL AND MOISTURE PROTECTION **Section: 07 57 00 — Coated Foam Roofing**	**REPORT HOLDER: HUNTSMAN BUILDING SOLUTIONS LLC**	**EVALUATION SUBJECT: HUNTSMAN BUILDING SOLUTIONS LLC COATED FOAM ROOFING SYSTEMS**	

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)*

Properties evaluated:

- Physical properties
- Fire classification
- Wind resistance
- Impact resistance

2.0 USES

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

3.0 DESCRIPTION

3.1 General:

The Huntsman Building Solutions LLC coated foam plastic roof covering system consists of a liquid-applied acrylic coating applied over a spray-applied polyurethane foam plastic insulation.

3.2 Spray-applied Polyurethane Foam Plastic Insulations:

Huntsman Building Solutions LLC insulations are two-component, spray-applied, polyurethane foam plastic insulations produced in nominal densities of 2.5 and 2.8 and 3.0 pcf (40.0, 44.7 and 48.0 kg/m^3). The foam plastic ingredients (Component A and Component B) are available in 55-gallon (208 L) drums and have a shelf life of 12 months for Component A and 12 months for Component B when stored in unopened containers at temperatures between 50°F and 90°F (10°C and 32°C).

The 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 4 inches (101 mm).

3.2.1 LPA2500, LPA2800 and LPA3000: LPA2500, LPA2800 and LPA3000 are produced in nominal densities of 2.5 and 2.8 and 3.0 pcf (40.0, 44.7 and 48.0 kg/m^3), respectively.

3.2.2 LPA2500-4G, LPA2800-4G and LPA3000-4G: LPA2500-4G, LPA2800-4G and LPA3000-4G are produced in nominal densities of 2.5 and 2.8 and 3.0 pcf (40.0, 44.7 and 48.0 kg/m^3), respectively.

3.3 Coatings:

3.3.1 General: The coatings are single-component, liquid-applied, 100 percent acrylic elastomeric coatings complying with ASTM D6083 as Type I. The coatings are supplied in 5-gallon (18.9 L) pails, 55-gallon (209 L) drums and 250-gallon (950 L) totes; and haves a shelf life of 12 months when stored in unopened containers at temperatures between 50°F and 90°F (10°C and 32°C).

3.3.2 Thermo-Flex 1000 Series Elastomeric Roof Coatings: Thermo-Flex TF 1001 White Elastomeric Roof Coating, Thermo-Flex TF 1002 Gray Elastomeric Roof Coating, and Thermo-Flex TF 1003 Tan Elastomeric Roof Coating are acrylic coatings complying with ASTM D6083 as Type I. The coatings are identical except for color where TF 1001 is white, TF 1002 is gray, and TF 1003 is tan.

3.3.3 TF 751 Therm-O-Flex Elastomeric Roof Coating White, TF 752 Therm-O-Flex Elastomeric Roof Coating Gray, TF 753 Therm-O-Flex Elastomeric Roof Coating Tan: The acrylic coatings are identical except for color where TF 751 is white, TF 752 is gray, and TF 753 is tan. Coating are acrylic coatings complying with ASTM D6083 as Type I. The coatings are identical except for color where TF 751 is white, TF 752 is gray, and TF 753 is tan.

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 DESIGN AND 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 Huntsman Building Solutions LLC published installation instructions.

4.2 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. All plywood edges must be supported by blocking or have tongue-and-groove joints in accordance with the requirements in IBC Section 2603.4.1.5 or IRC Section R316.5.2, as applicable.

4.2.2 Noncombustible Substrates:

4.2.2.1 Concrete Substrates: Structural concrete substrates must have a minimum compressive strength of 2500 psi (17.2 MPa). The concrete substrate must be thoroughly cured and primed or otherwise treated in accordance with Huntsman Building Solutions LLC published installation instructions.

4.2.2.2 Metal Substrates: Metal substrates must be minimum No. 22 gage galvanized steel [0.030 inch (0.76 mm)] deck. Metal decks must be cleaned of any adhesion inhibitors. If free of rust or loose scale, the steel surface may be cleaned by use of an air jet, vacuum equipment, or hand or power broom to remove loose dirt. Grease, oil, or other obvious contaminants must be removed by a suitable detergent or cleaner. Application of a primer before application of the insulation must be in accordance with the Huntsman Building Solutions LLC published installation instructions.

4.3 Roof Slope:

The Huntsman Building Solutions LLC coated foam roof systems 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 Table 1.

4.4 Foam Plastic Insulation Application:

The Huntsman Building Solutions LLC foam plastic insulations described in Section 3.2 must be 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 specified by Huntsman Building Solutions LLC 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 12 miles per hour (19 km/h).

The 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.

The Huntsman Building Solutions LLC insulations may be applied in one or more passes from ¾-inch-thick (19 mm) up to maximum, 2-inch-thick (50 mm), 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 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, no less than 2 hours not more than 72 hours after application of the insulation, the coating must be brush-, roller-, or spray-applied at the application rates noted in Tables 1 and 2. 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 first coat must be allowed to cure in accordance with Huntsman Building Solutions LLC published installation instructions before application of the second coat. The application of primers, when used, must be in accordance with Huntsman Building Solutions LLC published installation instructions.

4.6 Fire Classification:

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

4.6.2 Reroofing: The Huntsman Building Solutions LLC coated foam plastic roof covering system may be applied over existing built-up roof coverings as described System Nos. 5 and 6 in Table 1. Prior to installation of the new roof covering system over the existing roof system, inspection in accordance with 2021 IBC Section 1512, 2018 and 2015 IBC Section 1511, 2021, 2018 and 2015 IRC Section R908 [2012, 2009 and 2006 IBC Section 1510 or 2012, 2009 or 2006 IRC Section R907], and approval from the code official having jurisdiction are required. Installation must be over existing uninsulated systems only.

4.7 Wind Resistance:

The allowable wind uplift pressures for the Huntsman Building Solutions LLC coated foam plastic roof coverings are as noted in Table 2.

5.0 CONDITIONS OF USE:

The Huntsman Building Solutions LLC coated foam plastic roof coverings described in this report comply with, or are a suitable alternative 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 Huntsman Building Solutions LLC coated foam plastic roof covering systems must comply with the applicable code, Huntsman Building Solutions LLC 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 insulations must be applied by installers trained or approved by Huntsman Building Solutions LLC

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 The Huntsman Building Solutions LLC coated foam roofing systems must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4 or IRC Section R316.5.2, as applicable.

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 or IBC Section 1609.6.

5.6 Flashing must be installed at wall and roof intersections, at gutters and around roof openings, as required by IBC Section 1503.2 or IRC Section R903.2, as applicable.

5.7 Use of the foam plastic insulation as a vapor retarder is outside the scope of this report. If required, a vapor retarder must be installed in accordance with the applicable code.

5.8 The Huntsman Building Solutions LLC polyurethane foam plastic insulation components and the Huntsman Building Solutions LLC acrylic roof coatings are manufactured in Houston, 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 April 2020 (editorially revised July 2020).

6.2 Report of tests on in accordance with ASTM D6083.

6.3 Reports of tests in accordance with Appendix B of FM 4474.

6.4 Reports of tests in accordance with Section 4.6 of FM 4470.

6.5 Reports of tests in accordance with ASTM E108 (UL 790).

6.6 Reports of tests in accordance with ASTM E84 (UL 723).

7.0 IDENTIFICATION

7.1 Each container of the polyurethane foam plastic insulation components bears a label with the Huntsman Building Solutions LLC name and address; the product name; the component type [A or B]; the density (Component B only); the flame spread index; the date of manufacture; the shelf life; and the evaluation report number (ESR-3916).

Each container of acrylic roof coating is labeled with the Huntsman Building Solutions LLC name and address; the product name; the date of manufacture; the shelf life; and the evaluation report number (ESR-3916).

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

HUNTSMAN BUILDING SOLUTIONS LLC
3315 EAST DIVISION STREET
ARLINGTON, TEXAS 76011
(817) 640-4900
www.huntsmanbuildingsolutions.com

TABLE 1—FIRE CLASSIFICATION—COATED FOAM ROOF ASSEMBLIES

System NO.	FIRE CLASSIFICATION	SUBSTRATE	MAXIMUM ROOF SLOPE	SPRAY-APPLIED FOAM PLASTIC INSULATION[1]		COATING		TOP SURFACING
				Designation	Thickness (inches)	Designation	Application Rate	
1	A	Non-combustible	2:12	Huntsman Building Solutions LLC LPA2500, LPA2800, LPA3000, LPA2500-4G, LPA2800-4G or LPA3000-4G	Minimum 1 inch	Huntsman Building Solutions LLC Therm-O-Flex Elastomeric Roof Coating TF 1001, TF 1002, TF 1003, TF 751, TF 752 or TF 753	Two coats applied at 1½ gallons per 100 ft² per coat	Optional - No. 10 roofing granules, applied at 25 pounds per 100 ft²
2	A	Non-combustible covered with any UL classified polyisocyanurate insulation board, maximum 2 inches thick, mechanically fastened.	2:12		Minimum 1 inch			Optional - No. 10 granules, applied at 25 pounds per 100 ft²
3	A	15/32-inch-thick plywood	1/2:12		Minimum 1 inch			Crushed aggregate surfacing[3]
4	B	15/32-inch-thick plywood	1/2:12		Minimum 1.5 inch			No. 10 granules, applied at 25 pounds per 100 ft²
5	A, B or C gravel or smooth surfaced BUR[2] (loose gravel may be removed) to maintain existing classification	Optional - Class A, B or C BUR[2] covered with minimum ¼-inch-thick USG Securock™ Roof Board (Type FRX-G) mechanically fastened or fully adhered with all barrier board joints staggered a minimum of 6 inches from the plywood deck joints	2:12		Minimum 1.5 inch			Optional - No. 10 granules, applied at 25 pounds per 100 ft²

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.

[1]The Huntsman Building Solutions LLC spray-applied foam plastic insulation must be UL classified.
[2]BUR – Existing built-up roof.
[3]The crushed aggregate surfacing consists of crushed aggregate (at 70 pounds per 100 ft²) embedded in the wet topcoat, followed by a field mixture of Huntsman Building Solutions LLC "HARD-LOK" dry mix (40 pounds) and Huntsman Building Solutions LLC "HARD-LOK" resin at 5 gallons and ¾ ounce, spray-applied at one batch per 100 ft².

TABLE 2—WIND RESISTANCE—COATED FOAM ROOF COVERINGS[1]

SYSTEM NO.	ALLOWABLE WIND UPLIFT (psf)	SUBSTRATE[2]	FOAM PLASTIC INSULATION		COATING	
			DESIGNATION	THICKNESS (inches)	DESIGNATION	APPLICATION RATE
1	990	Concrete	Huntsman Building Solutions LLC Spray-applied Polyurethane Foam Plastic Insulation LPA2500, LPA2800, LPA3000, LPA2500-4G, LPA2800-4G or LPA3000-4G	Maximum 3	Huntsman Building Solutions LLC Therm-O-Flex Elastomeric Roof Coating TF 1001, TF 1002, TF 1003, TF 751, TF 752 or TF 753	Two coats applied at 1½ gallons per 100 ft²
2	60	Steel deck[3]		1 (above top of deck)		
3	165	Steel deck[4]		1 (above top of deck)		

For **SI:** 1 inch = 25.4 mm; 1 psf = 4.882 kg/m²; 1 gallon per 100 square feet = 0.41 L/m²

[1]The assembly must be FM approved.
[2]The concrete and steel deck substrates must be in accordance with Section 4.2.2 of this report.
[3]Painted galvanized steel deck secured to minimum ¼-inch-thick (6 mm) steel deck supports, at a maximum of 6 feet (1.8 m) on center, with TRAXX/5 fasteners and ¾ inch (19 mm) washers installed 6 inches (152 mm) on center (every rib). Side laps are secured with ITW Buildex TEKS 1 fasteners at a maximum of 24 inches (610 mm) on center.
[4]Galvanized steel deck secured to minimum ¼-inch-thick (6 mm) steel deck supports, at a maximum of 6 feet (1.8 m) on center, with TRAXX/5 fasteners and ¾ inch (19 mm) washers installed 6 inches (152 mm) on center (every rib). Side laps are secured with button punches at a maximum of 24 inches (610 mm) on center.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 57 00—Coated Foam Roofing

REPORT HOLDER:

HUNTSMAN BUILDING SOLUTIONS LLC

EVALUATION SUBJECT:

HUNTSMAN BUILDING SOLUTIONS LLC COATED FOAM ROOFING SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Huntsman Building Solutions LLC coated foam roofing systems, described in ICC-ES evaluation report ESR-3916, have also been evaluated for compliance with the codes noted below.

Applicable codes:

- 2019 *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 Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code*® (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Huntsman Building Solutions LLC coated foam roofing systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-3916 comply with CBC Chapter 15, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 15, as applicable.

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.

2.2 CRC:

The Huntsman Building Solutions LLC coated foam roofing systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-3916 comply with CRC Chapter 9, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC section R337, as applicable.

This supplement expires concurrently with the evaluation report, reissued September 2024.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 57 00—Coated Foam Roofing

REPORT HOLDER:

HUNTSMAN BUILDING SOLUTIONS LLC

EVALUATION SUBJECT:

HUNTSMAN BUILDING SOLUTIONS LLC COATED FOAM ROOFING SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Huntsman Building Solutions LLC coated foam roofing systems, described in ICC-ES evaluation report ESR-3916, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

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

2.0 CONCLUSIONS

The Huntsman Building Solutions LLC coated foam roofing systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-3916, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-3916 for the 2018 *International Building Code®* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Huntsman Building Solutions LLC coated foam roofing systems for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this evaluation report.

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 September 2024.