ICC-ES Evaluation Report

ESR-2140

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This report also contains:

- CBC Supplement

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DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION **Section: 07 56 00—Fluid-Applied Roofing** **Section: 07 57 00—Coated Foam Roofing**	**REPORT HOLDER: NATIONAL COATINGS CORPORATION**	**EVALUATION SUBJECT:** **ACRYSHIELD AND ACRYPLY ROOF COATING SYSTEMS**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, 2009 and 2006 *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

2.0 USES

AcryShield and AcryPly roof coating systems are used in the construction of Class A, B and C roof coverings, as noted in Tables 1 and 2. The roof coverings can be used on buildings of any type of construction.

3.0 DESCRIPTION

3.1 General:

The AcryShield Polyurethane Foam Roofing System consists of one of the spray-applied foam plastic insulations described in Section 3.2 covered with the AcryShield elastomeric coating described in Section 3.3, with or without the optional reinforcing fabric described in Section 3.5 and the optional Roof Guard top surfacing described in Section 4.5. The AcryPly Coating System consists of the LiquiSeal coating described in Section 3.4 covered with the AcryShield coating described in Section 3.3, with or without the optional reinforcing fabric described in Section 3.5, installed in accordance with Section 4.6.

3.2 Spray-applied Foam Plastic Insulations:

3.2.1 BASF ELASTOSPRAY Series: BASF Polyurethane Foam Enterprises ELASTOSPRAY 81255, 81285 and 81305 are two-component, spray-applied, foam plastic insulations complying with ASTM C1029, and are produced in densities of 2.5, 2.8 and 3.0 pcf (40.0, 44.8 and 48.0 kg/m^3), respectively. The foam plastic insulations have a flame-spread rating of 75 or less when tested in accordance with ASTM E84 at a maximum

thickness of 2.0 inches (51 mm). The foam plastic ingredients (Component A and Component B) are available in 55-gallon (208 L) containers and have a shelf life of three months, when stored unopened at temperatures between 50°F and 80°F (10°C and 26.7°C). BASF ELASTOSPRAY Series foam plastic insulations are recognized in ESR-2298.

3.2.2 BASF Foam Enterprises FE348: BASF Polyurethane Foam Enterprises FE348-2.5, FE348-2.8 and FE348-3.0 are two-component, spray-applied, foam plastic insulations complying with ASTM C1029, and are produced in densities of 2.5, 2.8 and 3.0 pcf (40.0, 44.8 and 48.0 kg/m^3), respectively. The foam plastic insulations have a flame-spread rating of 75 or less when tested in accordance with ASTM E84 at a maximum thickness of 2.0 inches (51 mm). The foam plastic ingredients (Component A and Component B) are available in 55-gallon (208 L) containers and have a shelf life of three months when stored at temperatures between 50°F and 80°F (10°C and 26.7°C). BASF Foam Enterprises FE348 foam plastic insulations are recognized in ESR-2298.

3.3 AcryShield Coating: AcryShield is a single-component, liquid-applied, acrylic elastomeric coating complying with ASTM D6083. The coating is available in 5-gallon (19 L) and 55-gallon (208 L) containers, and has a shelf life of one year when stored in factory-sealed containers at temperatures between 50°F and 80°F (10°C and 26.7°C).

3.4 AcryPly Coating System:

The AcryPly Coating System consists of LiquiSeal coating, described in this section, covered with the AcryShield coating described in Section 3.3, with or without the optional reinforcing fabric described in Section 3.5 LiquiSeal is a nonfibered, asphaltic, bentonite water-based material complying with ASTM D1227, used as the base coat for the AcryShield coating described in Section 3.3 and applied as described in Table 2. The LiquiSeal coating is available in 5- and 55-gallon (18.9 and 208.2 L) containers, and has a shelf life of one year when stored in unopened containers at temperatures between 50°F and 80°F (10°C and 26.7°C).

3.5 Reinforcement:

The fabric reinforcement (T272, T325 or T326) is 3-ounce-per-square-yard (101.7 g/m^2) stitch-bonded polyester, as referenced in Tables 1 and 2.

3.6 Impact Resistance:

The AcryShield and AcryPly roof coating systems described in this report comply with the Resistance to Foot Traffic Test described in Section 4.6 of FM 4470.

4.0 INSTALLATION

4.1 Preparation of Substrates:

The substrates to be covered must be free of grease, oil, loose particles, moisture or any other substances that might interfere with the bond between the foam plastic and the substrate, or between the coating and the substrate. For foam roofing applications, areas not receiving a polyurethane foam plastic insulation application must be masked off or otherwise protected from overspray. Substrates must be prepared in accordance with the foam plastic insulation manufacturer's installation instructions for foam roofing applications or the report holder's installation instructions when foam plastic insulation is not used. Primers, if required by the installation instructions, must be in accordance with the instructions.

Existing code-complying built-up roof systems must be repaired and made sound and watertight prior to application of the AcryShield or AcryPly roof coating system.

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. All plywood edges must be supported by blocking or have tongue-and -groove joints in accordance with IBC Section 2603.4.1.5.

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) [minimum of 24 MPa is required under ADIBC Appendix L, Section 5.1.1].

4.2.2.2 Metal Substrates: Metal substrates must be minimum No. 22 gage galvanized steel deck [base-metal thickness 0.030 inch (0.76 mm)].

4.3 Roof Slope:

The roofing systems must be applied to provide a minimum slope of $^1/_4$:12 (2 percent) and a maximum slope as specified in Tables 1 and 2.

4.4 Foam Plastic Insulation Application:

The insulations described in Section 3.2 are spray-applied in a 1:1 ratio by volume of the A and B components to one of the substrates described in Section 4.2, using spraying equipment recommended by National Coatings Corporation. Application of the insulation must be as described in evaluation report ESR-2298.

The total finished thickness specified in Table 1 or Table 3, as applicable, 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 AcryShield Coating:

All surfaces must be dry and free of all dirt, damaged foam, and foreign material before application of the coating. AcryShield coating must be spray-applied over the foam plastic insulation using spray equipment designed for use with high-viscosity coatings. When the coatings are applied over existing built-up roofs, application by roller is acceptable. The coating must be applied at the rate specified in Table 1. AcryShield coatings must not be applied if either, or both, of the following conditions exist:

1. Substrate surface or ambient temperatures are less than 50°F (10°C).
2. Surface is subject to precipitation or freezing.

Foam plastic insulation must be coated within 48 hours of application, to avoid the possibility of oxidation. If the foam plastic is oxidized, the oxidized surface must be broomed and primed prior to application of AcryShield. The first coating must not be applied until two hours after application of the foam plastic insulation. Approximately two to 24 hours must be allowed, depending on weather conditions, before application of the coatings. The first coat must be allowed to cure in accordance with the report holder's installation instructions before application of the second coat.

When the coating is applied over foam plastic insulation, an optional surfacing consisting of No. 6 crushed limestone may be embedded into the top coating, applied at a rate of 64 pounds per 100 square feet (3.1 kg/m^2). The Roof Guard roof mix is applied at a rate of one batch per 100 square feet (9.29 m^2). One batch consists of 40 pounds (18.1 kg) of dry mix, 4$^1/_2$ gallons (17.0 L) of water, $^1/_2$ gallon (1.9 L) of Roof Guard acrylic resin and $^3/_4$ ounce (21.3 g) of Colloid 60.

4.6 Application of the AcryPly Coating System:

The LiquiSeal base coat is applied by spray equipment designed for spraying high-viscosity coatings, and may need mixing with a power mixer prior to use. Application by roller or roofing broom is acceptable when the material is applied evenly. Temperature and weather limitations are the same as those noted in Section 4.5 for the AcryShield coating. The LiquiSeal coat must be installed at the application rate specified in Table 2 and must be allowed to cure for a minimum of 24 hours before installation of the AcryShield coating at the application rate specified in Table 2.

Before application of AcryShield coating over a LiquiSeal base coat, the surface must be thoroughly rinsed to remove any deleterious substances. The AcryShield coating must be applied in the manner described in Section 4.5, at the application rate specified in Table 2.

4.7 Fire Classification:

4.7.1 New Construction: The fire classification of the roof systems are noted in Tables 1 and 2.

4.7.2 Reroofing: The AcryShield and AcryPly roof coating systems may be applied over existing built-up roof coverings as described in Tables 1 and 2, respectively. Prior to installation of the new roof covering system over an existing roof system, inspection in accordance with 2018 and 2015 IBC Section 1511 or 2012, 2009 and 2006 IBC Section 1510, as applicable, and approval from the code official having jurisdiction, are required.

This evaluation report recognizes installation of the new coated foam roofing system over existing uninsulated systems only, and recovering must be in accordance with 2018 and 2015 IBC Section 1511 or 2012, 2009 and 2006 IBC Section 1510, as applicable. Fire classification is noted in Tables 1 and 2.

4.8 Wind Resistance

The allowable wind uplift pressures for the coated foam plastic roof covering assemblies are noted in Table 3.

5.0 CONDITIONS OF USE:

The AcryShield and AcryPly roof coating systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The installation and application of the roof covering systems must comply with the applicable 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 All materials must be applied by installers approved by National Coatings Corporation.

5.3 Where moderate or heavy foot traffic occurs for maintenance of equipment, or is otherwise necessary, the roof covering system must be adequately protected to prevent rupture or wearing of the surface.

5.4 The allowable wind uplift pressures listed in Table 3 are for the roof coverings only. The deck and supporting structure to which the roof covering is attached must be designed to withstand the applicable wind pressure determined in accordance with ASCE 7 or 2015, 2012, 2009 and 2006 IBC Section 1609.6.

5.5 Flashing, when required, must be installed in accordance with IBC Section 1503.2.

5.6 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.

5.7 AcryShield is manufactured in Camarillo, California, and LiquiSeal is manufactured for National Coatings Corporation, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Reports of tests on AcryShield in accordance with ASTM D6083.

6.2 Report of tests on LiquiSeal in accordance with ASTM D1227.

6.3 Reports of tests in accordance with FM 4470.

6.4 Reports of accelerated weathering tests in accordance with IBC Section 1504.6.

6.5 Reports of roof classification tests in accordance with ASTM E108 and UL 790.

7.0 IDENTIFICATION

7.1 Each container of AcryShield and LiquiSeal coating is labeled with the report holder's name (National Coatings Corporation) and address, the product designation, the evaluation report number (ESR-2140), the date of manufacture, the shelf life, and the batch number. The polyester fabric reinforcement is identified as T272, T325 or T326.

Each container of BASF ELASTOSPRAY and BASF Foam Enterprises FE348 polyurethane foam plastic insulation must be labeled in accordance with Section 7.0 of ESR-2298.

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

NATIONAL COATINGS CORPORATION
1201 CALLE SUERTE
CAMARILLO, CALIFORNIA 93012
(805) 388-7112
www.nationalcoatings.com

TABLE 1—FIRE CLASSIFICATION – ACRYSHIELD ROOF ASSEMBLIES

SYSTEM NO.	ROOF CLASS	ROOF DECK SUBSTRATE OR EXISTING ROOF	MAXIMUM ROOF SLOPE	FOAM PLASTIC INSULATION			ACRYSHIELD[1] APPLICATION RATE	TOP SURFACING
				DESIGNATION	MFR.	THICKNESS (inches)		
1	A	Noncombustible	3:12	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1 - 2	Two coats at 1 1/2 gallons per 100 ft² per coat	Roof Guard[3] (optional)
2	A	Noncombustible	Unlimited	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1 - 2	Two coats at 1 1/2 gallons per 100 ft² per coat	No. 11 roofing granules (30 lbs/sq.)
3	B	Minimum 15/32-inch-thick plywood[4]	1/2:12	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1 1/2 - 2	Two coats at 1 1/2 gallons per 100 ft² per coat	Roof Guard[3] (optional)
4	B	Minimum 15/32-inch-thick plywood	1/2:12	ELASTOSPRAY 81255, 81285, 81305 and FE348	BASF	1 1/2 – 2	Two coats at 1 1/2 gallons per 100 ft² per coat	No. 11 roofing granules (30 lbs/sq.)
5	A	Class A or B BUR[2] over noncombustible deck	3:12	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1 – 2	Two coats at 1 1/2 gallons per 100 ft² per coat	No. 11 roofing granules (40 lbs/sq.)
6	B	Class B or C BUR[2] over minimum 15/32-inch-thick plywood	2:12	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1 - 2	Two coats at 1 1/2 gallons per 100 ft² per coat	No. 11 roofing granules (40 lbs/sq.)
7	A	Noncombustible	1:12	---	---	---	Two coats at 1-2 gallons per 100 ft² per coat	Roof Guard[3] (optional)
8	Same as existing roof	Class A, B or C BUR[2] over minimum 15/32-inch-thick plywood	1:12	---	---	---	Two coats at 1-2 1/2 gallons per 100 ft² per coat	Roof Guard[3] (optional)
9	Same as existing roof	Class A, B or C BUR[2] over minimum 15/32-inch-thick plywood	1/2:12	---	---	---	Three coats at 2 gallons per 100 ft² per coat	Roof Guard[3] (optional)
10	Same as existing roof	Class A, B or C BUR[2] over minimum 15/32-inch-thick plywood	3:12	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1½ minimum	Two coats at 1 to 2½ gallons per 100 ft² per coat	No. 11 roofing granules (30 lbs/sq.)
11	B	Class A, B or C BUR[2] over minimum 15/32-inch-thick plywood (loose gravel may be removed)	½:12	ELASTOSPRAY 81255, 81285, 81305 or FE348	BASF	1½ minimum	Two coats at 1 to 2½ gallons per 100 ft² per coat	No. 11 roofing granules (30 lbs/sq.)

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

[1]Reinforcement with 1 ply of 3 oz./sq. yd. polyester fabric (T272, T325 or T326) is optional.
[2]BUR – Existing Built-up roofing.
[3]Roof Guard – See Section 4.5 for field mixing instructions.
[4]For System No. 3, all joints in the plywood deck must be blocked with minimum 2-by-4 wood framing.

TABLE 2—FIRE CLASSIFICATION – ACRYPLY (ACRYSHIELD/LIQUISEAL) ROOF ASSEMBLIES

SYSTEM NO.	ROOF CLASS	SUBSTRATE	MAXIMUM ROOF SLOPE	COATINGS	
				LIQUISEAL[1] (gallons per 100 ft^2)	ACRYSHIELD
1	A	Noncombustible (See Section 4.2.2)	2:12	10 – Minimum 20 – Maximum	Two coats at 1$^1/_2$-3 gallons per 100 ft^2 per coat
2	Same as existing roof	Class A, B or C BUR[2] over $^{15}/_{32}$-inch-thick plywood	1$^1/_2$:12	10 – Minimum 20 – Maximum	Two coats at 1$^1/_2$-3 gallons per 100 ft^2 per coat

For **SI:** 1 inch = 25.4 mm; 1 gallon per 100 ft^2 = 0.41 L/m^2; 1 gallon = 3.785 L; 1 ft = 0.0929 m^2.

[1]One to 3 plies of 3 oz./sq. yd. polyester fabric (T272, T325 or T326) is embedded in the coating.
[2]For gravel roofs, loose gravel is removed and replaced with one layer of UL Classified Type G2 glass fiber base sheet, mechanically fastened to the roof deck or hot-mopped to the substrate.

TABLE 3—WIND RESISTANCE OF ACRYSHIELD COATED FOAM ROOF COVERINGS

SYSTEM NO.	ROOF DECK SUBSTRATE[2]	ALLOWABLE WIND UPLIFT (psf)	INSULATION[1] THICKNESS (inches)	ACRYSHIELD APPLICATION RATE
1	Noncombustible	90	2 – 2$^1/_2$	Two coats at 1$^1/_2$ - 2$^1/_2$ gallons per 100 ft^2 per coat
2	$^{15}/_{32}$-inch-thick plywood	90	2 – 2$^1/_2$	Two coats at 1$^1/_2$ - 2$^1/_2$ gallons per 100 ft^2 per coat

For **SI:** 1 inch = 25.4 mm; 1 psf = 4.882 kg/m^2.

[1]Foam plastic insulation and coatings must be applied in accordance with the manufacturer's installation instructions and this report**.** BASF foam plastic insulations must be installed at a thickness of 2 inches.
[2]Wood deck must be minimum $^{15}/_{32}$-inch-thick (11.9 mm) plywood. Steel deck must be minimum No. 22 gage galvanized steel [0.030 inch (0.76 mm)]. Concrete must have a minimum compressive strength (f_c) of 2500 psi [minimum of 24 MPa is required under ADIBC Appendix L, Section 5.1.1].

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 56 00—Fluid-Applied Roofing
Section: 07 57 00—Coated Foam Roofing

REPORT HOLDER:

NATIONAL COATINGS CORPORATION

EVALUATION SUBJECT:

ACRYSHIELD AND ACRYPLY ROOF COATING SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Acryshield And Acryply Roof Coating Systems, described in ICC-ES evaluation report ESR-2140, have also been evaluated for compliance with the code noted below.

Applicable code edition:

2019 and 2016 *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 State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS

2.1 CBC:

The AcryShield and AcryPly Roof Coating Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-2140, comply with CBC Chapter 15, provided the design and installation are in accordance with the 2018 and 2015 *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 of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

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

This supplement expires concurrently with the evaluation report, reissued September 2023.

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