



Most Widely Accepted and Trusted

ICC-ES Report

ESR-1221

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Reissued 12/2015
This report is subject to renewal 12/2016.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 57 00—COATED FOAM ROOFING

REPORT HOLDER:

COVESTRO, LLC

**2400 SPRING STUEBNER ROAD
SPRING, TEXAS 77389**

EVALUATION SUBJECT:

BAYSEAL™ SPRAY-APPLIED POLYURETHANE ROOFING SYSTEMS



Look for the trusted marks of Conformity!

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



A Subsidiary of

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



ICC-ES Evaluation Report

ESR-1221

Reissued December 2015

Revised May 2016

This report is subject to renewal December 2016.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

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

COVESTRO, LLC
 2400 SPRING STUEBNER ROAD
 SPRING, TEXAS 77389
 (281) 350-9000
www.polyurethanes.covestro.com

EVALUATION SUBJECT:
**BAYSEAL™ SPRAY-APPLIED POLYURETHANE
ROOFING SYSTEMS**
ADDITIONAL LISTEE:

MOMENTIVE PERFORMANCE MATERIALS
 260 HUDSON RIVER ROAD
 WATERFORD, NEW YORK 12188
**PRODUCT NAME: SCM 3400 SERIES SILICONE ROOF
COATING (SERIES 3402, 3404, 3405 AND 3408)**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 *International Building Code*® (IBC)
- Other Codes (see Section 8.0)

Properties evaluated:

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

2.0 USES

The Bayseal™ spray-applied polyurethane roofing systems described in this evaluation report are used in the construction of classified roof coverings 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:

Bayseal™ spray-applied polyurethane roofing systems consist of Bayseal™ 2.5/3.0 series spray-applied

polyurethane foam insulation covered with Bayblock™ II, Bayblock™ HT or SCM 3400 series liquid-applied coatings. When installed as described in this report, these systems have roof classifications as set forth in Table 1.

3.2 Spray Polyurethane Foam Plastic Insulation:

3.2.1 General: Bayseal™ 2.5/3.0 series spray-applied polyurethane foam complying with ASTM C1029 Type III, has a nominal density between 2.5 pcf (40 kg/m³) and 3.0 pcf (48 kg/m³). The foam plastic liquid components (designated component A and component B) are available in 55-gallon (208 L) containers and have a six-month shelf life when stored out of direct sunlight at temperatures between 50°F and 80°F (10°C and 27°C).

3.2.2 Surface-burning Characteristics:

Bayseal™ 2.5/3.0 series spray-applied polyurethane foam plastic has a flame-spread index of 75 or less and a smoke-developed index of greater than 450 when tested in accordance with UL 723 at a maximum thickness of 2.5 inches (63.5 mm).

The classified roof assemblies noted in Table 1, containing Bayseal™ 2.5/3.0 Series foam plastic insulation, are recognized for use without a thermal barrier based on testing in accordance with UL 1256, as specified in IBC Section 2603.4.1.5.

3.3 Coatings:

3.3.1 Bayblock™ II Acrylic Roof Coating: Bayblock™ II acrylic roof coating is a single-component, liquid-applied, 100 percent acrylic elastomeric coating complying with ASTM D6083, produced by Covestro, LLC. It is available in 5-gallon (19 L), 55-gallon (208 L) and 275-gallon (1045 L) containers with a shelf life of twelve months when stored in factory-sealed containers at temperatures between 50°F and 100°F (10°C and 38°C).

3.3.2 Bayblock™ HT Acrylic Roof Coating: Bayblock™ HT acrylic roof coating is a single-component, liquid-applied, 100 percent acrylic elastomeric coating complying with ASTM D6083, produced by Covestro, LLC. It is available in 5-gallon (19 L), 55-gallon (208 L) and 275-gallon (1045 L) containers with a shelf life of twelve months when stored in factory-sealed containers at temperatures between 50°F and 100°F (10°C and 38°C).

3.3.3 SCM 3400 Series Silicone Roof Coating: SCM 3400 series silicone roof coating is a single-component, silicone rubber liquid coating complying with ASTM D6694, produced by Momentive Performance Materials. It is available in 6-gallon pails (22.7 L) and 55-gallon (208 L)

drums and has a shelf life of eighteen months when stored in factory-sealed containers at temperatures between 50°F and 100°F (10°C and 38°C).

3.4 Wind Resistance:

The allowable wind uplift pressures for the coated Bayseal™ 2.5/3.0 spray polyurethane foam insulation roof covering assemblies are set forth in Table 2 of this evaluation report.

3.5 Impact and Foot Traffic Resistance:

The foam insulation roof coverings described in this evaluation report comply with the resistance to foot traffic requirements in Section 5.5 of FM 4470.

4.0 INSTALLATION

4.1 Preparation of Substrate:

The substrates to be covered must be free of grease, oil, loose particles, moisture and other foreign materials. Areas not receiving a polyurethane foam plastic application must be masked off or otherwise protected from overspray, and openings in the roof covering system must be flashed in accordance with IBC Section 1503.2 and installed in accordance with the manufacturer's published installation instructions.

4.2 Substrates:

4.2.1 Combustible Substrates: Combustible substrates must be minimum $1\frac{5}{32}$ -inch-thick (11.9 mm), code-complying, exterior grade or Exposure 1 plywood. All plywood substrate edges must be supported by blocking or have tongue-and-groove joints as required by IBC Section 2603.4.1.5. The wood surface must be primed with a suitable primer/sealer when specifically required by the manufacturer's installation instructions.

4.2.2 Noncombustible Substrates:

4.2.2.1 Cementitious Substrates: Structural concrete must have a minimum compressive strength of 2500 psi (17.2 MPa). Cementitious decks must be thoroughly cured and must be subjected to specialized treatment, such as wire brushing or commercial sand blasting, or must be chemically cleaned to ensure adequate bonding when specifically required by manufacturers' installation instructions. Application of suitable primer may be required before application of spray foam plastic insulation, in accordance with the manufacturer's installation instructions.

4.2.2.2 Metal Substrates: Metal decks must be minimum No. 22 gage [0.03 inch (0.76 mm)] steel. 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 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 suitable primer may be required before application of the spray foam plastic, in accordance with manufacturer's installation instructions.

4.3 Roof Slope:

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

4.4 Foam Plastic Insulation Application:

Bayseal™ 2.5/3.0 spray polyurethane foam plastic insulation is spray-applied to the prepared substrate in

minimum $1\frac{1}{2}$ -inch- to 1-inch-thick (12.7 mm to 25.4 mm) passes to the thickness specified in Table 1, allowing a minimum of three minutes of curing time between passes. The insulation components are dispensed at a 1:1 ratio at the temperature and pressure specified in the manufacturer's installation instructions. Application of the foam plastic insulation must be performed when the substrate surface temperature is at least 50°F (10°C), the ambient temperature is at least 50°F (10°C) and the wind speed is no more than 15 miles per hour (6.7 m/s). The foam plastic must not be applied when the humidity is greater than 85 percent, when the dew point and the ambient temperature are within 5°F of one another, or when wind speeds are greater than 15 miles per hour (6.7 m/s). Adequate wind barriers are needed when wind speed is greater than 15 miles per hour (6.7 m/s). The foam plastic 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 finished foam surface must be smooth and free of voids, pinholes and crevices. At least a two-hour curing period is required prior to application of the coating.

4.5 Application of Coating:

The foam plastic insulation must be dry and free of all damaged foam, dirt and foreign material before application of the coating. The coating must be applied in accordance with the coating manufacturer's application instructions, no less than two hours nor more than 72 hours following application of the foam plastic insulation. The coating may be applied with brush or roller or by using spray equipment capable of handling high-viscosity liquids at the specified rates found in Table 1. The first coating must cure before application of the second coat. The ambient temperature must be greater than 50°F (10°C) during application and above 32°F (0°C) for at least a 24-hour period after application.

4.6 Fire Classification:

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

4.6.2 Reroofing: Prior to installation of the new roof covering system, inspection in accordance with IBC Section 1510 and approval from the code official having jurisdiction are required. This report recognizes recovering over uninsulated existing systems only, and recovering must be in accordance with IBC Section 1510.

5.0 CONDITIONS OF USE

The Bayseal™ spray-applied polyurethane roofing 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 coated foam plastic roof covering systems must comply with the code, the report holder's published application instructions and this evaluation report. If there are any conflicts between the report holder's application instructions and this evaluation report, this report governs.

5.2 All materials must be applied by installers approved by Covestro, LLC.

- 5.3 Where moderate or heavy foot traffic occurs, such as for maintenance of equipment, the roof covering must be adequately protected to prevent rupture or wearing of the surface.
- 5.4 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 pressure determined in accordance with ASCE 7 or Section 1609.6 of the IBC.
- 5.5 Flashing when required must be installed in accordance with IBC Section 1503.2.
- 5.6 The Bayseal™ 2.5/3.0 polyurethane foam plastic insulation and the Bayblock™ II and HT liquid-applied coatings are manufactured in Spring, Texas, and Phoenix, Arizona, under a quality control program with inspections by ICC-ES.

The SCM 3400 series liquid-applied coating is manufactured by Momentive Performance Materials in Waterford, New York, 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 November 2009.
- 6.2 Reports of tests in accordance with ASTM D6083 and ASTM D6694.
- 6.3 Reports of tests in accordance with FM 4470 and FM 4474.
- 6.4 Reports of tests in accordance with UL 723 (ASTM E84).
- 6.5 Reports of tests in accordance with UL 790 (ASTM E108).
- 6.6 Reports of tests in accordance with UL 1256.

7.0 IDENTIFICATION

Each container of Bayseal™ 2.5/3.0 spray-applied polyurethane foam insulation bears a label with the Covestro name and address, the product name (Bayseal™ 2.5, Bayseal™ 2.7 or Bayseal™ 3.0), the component type (A or B), the lot numbers, the flame spread index, the date of manufacture, and the evaluation report number (ESR-1221).

Each container of Bayblock™ liquid-applied coatings bears a label with the Covestro name and address, the product name (Bayblock™ II or Bayblock™ HT), the lot number, and the evaluation report number (ESR-1221).

Each container of SCM 3400 series silicone roof coating bears a label with the manufacturer's name (Momentive Performance Materials) and address, the product name (SCM 3400 Series), the shelf life and the date of manufacture, and the evaluation report number (ESR-1221).

8.0 OTHER CODES

In addition to the code referenced in Section 1.0, the roofing systems recognized in this report have also been evaluated for compliance with the requirements of the 2006 *International Building Code*® (2006 IBC). The products comply with the 2006 IBC as described in Section 2.0 through 7.0 of the report, except wind uplift resistance under the 2006 IBC is in accordance with FM 4470.

TABLE 1—BAYSEAL™ 2.5/3.0 ROOF COVERING SYSTEMS FIRE CLASSIFICATION

SYSTEM NO. ¹	ROOF DECK TYPE ²	FOAM PLASTIC INSULATION ³		COATING		TOP SURFACING	MAXIMUM ROOF SLOPE (in/ft)	ROOF CLASSIFICATION
		Product Designation	Thickness (inches)	TYPE	Application Rate			
1	Non-combustible	Bayseal™ 2.5/3.0 Series	1.5–2.5	SCM 3400 Series	Two coats at 1½ gallons per 100 ft² per coat	No.11 granules at 40 lbs/100 ft² (optional)	3:12	A
2	Non-combustible	Bayseal™ 2.5/3.0 Series	1.5–2.5	Bayblock™ II	Two coats at 1½ gallons per 100 ft² per coat	No.11 granules at 40 lbs/100 ft² (optional)	2:12	A
3	Non-combustible	Bayseal™ 2.5/3.0 Series	1.5–2.5	Bayblock™ HT	Two coats at 1½ gallons per 100 ft² per coat	No.11 granules at 40 lbs/100 ft² (optional)	1:12	A
4	Non-combustible	Bayseal™ 2.5/3.0 Series	1.5–2.5	SCM 3400 Series	Two coats at 1½ gallons per 100 ft² per coat	No.11 granules at 40 lbs/100 ft²	Unlimited	A
5	¹⁵ / ₃₂ -inch-thick combustible substrate	Bayseal™ 2.5/3.0 Series	1.5–2.5	SCM 3400 Series	Two coats at 1½ gallons per 100 ft² per coat	No.11 granules at 40 lbs/100 ft²	¹ / ₂ :12	B

For SI: 1 inch = 25.4 mm; 1 gallon per 100 ft² = 0.41 L/m²; 1 gallon = 3.785 L; 1 ft² = 0.0929 m²; 1 lb/100ft² = 0.0489 kg/m².

¹Roof covering systems No. 1–5 may be applied over an existing uninsulated roof covering without changing the existing roof covering fire classification.

²When roof covering systems No. 1–4 are installed over a combustible deck (minimum ¹⁵/₃₂ inch), a ¹/₄-inch-thick (6.4 mm) G-P Gypsum DensDeck® roof board or DensDeck Prime® roof board must be mechanically fastened over the combustible deck. The joints in the G-P gypsum board must be offset a minimum of 6 inches (152 mm) from the joints in the combustible deck.

³The foam plastic insulation must be UL-classified.

TABLE 2—WIND RESISTANCE OF COATED ROOF COVERINGS^{1,4}

SYSTEM NO.	SUBSTRATE	ALLOWABLE WIND UPLIFT (psf)	FOAM THICKNESS (inches)
W1	Structural concrete	990	2
W2	Steel deck ^{2,3}	210	2
W3	Steel deck ^{2,3}	150	2
W4	Steel deck ^{2,3}	90	2
W5	¹⁵ / ₃₂ combustible	160	1

For SI: 1 inch = 25.4 mm; 1psf = 0.0479 kPa.

¹Foam plastic insulations and coatings must be applied in accordance with the manufacturer’s installation instructions and this report. Concrete substrate and steel deck substrate must be the same as recognized in this evaluation report and listed by FM.

²Painted or galvanized steel deck secured to minimum ¹/₄-inch-thick (6 mm) steel supports, a maximum of 6 feet (1.8 m) on center, with ITW Buildex Tek 4 or Tek 5 fasteners at 6 inches (152 mm) on center (every rib). Side laps are secured with ITW Buildex Tek 1 fasteners a maximum of 30 inches (762 mm) on center. Deck is washed with a trisodium phosphate (TSP) and water solution, rinsed and allowed to dry.

³Painted galvanized steel deck secured to minimum ¹/₄-inch-thick (6 mm) steel supports, a maximum of 6 feet (1.8 m) on center, with ITW Buildex Traxx/4 or 5 fasteners a maximum of 6 inches (152 mm) on center (every rib). Side laps are secured with ITW Buildex Stitch Traxx/1 fasteners a maximum of 30 inches (762 mm) on center. Deck is washed with a trisodium phosphate (TSP) and water solution, rinsed and allowed to dry.

⁴Assembly must be FM-approved.