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# ICC-ES Evaluation Report

## ESR-2532

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Reissued 11/2018  
This report is subject to renewal 11/2019.

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

**REPORT HOLDER:**

**SWD URETHANE**

**EVALUATION SUBJECT:**

**SWD URETHANE SWD QUIK-SHIELD® | 125 COATED FOAM ROOFING SYSTEM**



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



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### 1.0 EVALUATION SCOPE

#### Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)

#### Properties evaluated:

- Physical properties
- Fire classification
- Wind resistance

### 2.0 USES

The SWD Urethane coated foam roofing systems described in this report are used in the construction of Class A and Class B roof coverings, as noted in Table 1. The roof covering systems may be used on buildings of any type of construction.

### 3.0 DESCRIPTION

#### 3.1 General:

The coated foam plastic roof covering systems described in this report consist of SWD Quik-Shield® | 125 foam plastic insulation, SWD Quik-Shield® | 1929F coating, surfacing, as described in Section 4.4.4, and (when required) primer.

#### 3.2 SWD Quik-Shield® | 125:

SWD Quik-Shield® | 125 is a two-component, spray-applied, polyurethane foam plastic insulation. The insulation is produced in the field by combining Component A with resin Component B, resulting in insulation with a nominal density range of 2.5 to 3.0 pcf (40 to 48 kg/m<sup>3</sup>). The insulation components are supplied in 55-gallon (208 L) drums and 2,500 pound (1125 kg) totes, and have a shelf life of six months when stored in unopened

containers at temperatures between 50°F (10°C) and 100°F (37.7°C).

The foam plastic insulation has a flame spread index of 25 or less for densities up to 2.7 pcf (43 kg/m<sup>3</sup>) and 75 or less for densities up to 3.0 pcf (48 kg/m<sup>3</sup>) when tested in accordance with ASTM E84 at a maximum thickness of 4 inches (102 mm).

#### 3.3 SWD -Shield® | 1929F:

SWD Quik-Shield® | 1929F is a water-based, acrylic, elastomeric coating complying with ASTM D6083, used over SWD Quik-Shield® | 125 foam plastic insulation. The coating is available in 5-gallon and 55-gallon (18.9 L and 208 L) containers, and has a shelf life of six months when stored in unopened containers at temperatures between 50°F and 100°F (10°C and 37.7°C).

#### 3.4 SWD Quik-Shield® | Cementitious Roof Mix:

SWD Quik-Shield® | Cementitious Roof Mix is a dry cementitious mix used in producing the field-mixed surfacing described in Section 4.4.4. The dry mix is supplied in 40-pound (18 kg) packages, and has a one-year shelf life when stored in a dry location in unopened packages, at temperatures between 50°F and 100°F (10°C to 37.7°C).

#### 3.5 SWD Quik-Shield® | 1000 and SWD Quik-Shield® | 2000 Primers:

SWD Quik-Shield® | 1000 and SWD Quik-Shield® | 2000 are neoprene-based primers for use over plywood, concrete or steel substrates. The primer is available in 5-gallon and 55-gallon (18.9 L and 208 L) containers, and has a shelf-life of six-months when stored in unopened containers at temperatures between 50°F and 100°F (10°C and 37.7°C).

#### 3.6 Impact Resistance:

The coated foam roofing systems described in this report comply with the Resistance to Foot Traffic Test in Section 5.5 of FM 4470, as referenced in IBC Section 1504.7.

#### 3.7 Thermal Transmission (R-values):

The insulation has thermal resistance (R-value) of 6.3 ft<sup>2</sup>hrF/Btu (1.11 k·m<sup>2</sup>/W), for a 1-inch (25.4 mm) thickness at a mean temperature of 75°F (24°C).

### 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. Areas not receiving foam plastic insulation must be masked off or otherwise protected from overspray.

## 4.2 Substrates:

**4.2.1 Plywood Substrates:** Substrates must be minimum  $1\frac{5}{32}$ -inch-thick (11.9 mm), code-complying, exterior-grade or Exposure 1 plywood. All plywood edges must be supported by blocking, have tongue-and-groove joints as required by IBC Section 2603.4.1.5, or 2015, 2012 and 2009 IRC Section R316.5.2 (2006 IRC Section R314.5.2), as applicable, or have a thermal barrier installed separating the interior of the building from the foam plastic in accordance with IBC Section 2603.4, or 2015, 2012 and 2009 IRC Section R316.4 (2006 IRC Section R314.4), as applicable.

**4.2.2 Concrete Substrates:** Concrete substrates must have a minimum compressive strength of 2500 psi (17.2 MPa). The concrete substrate must be thoroughly cured and must be cleaned prior to application of the primer to ensure proper bonding of the roof system.

**4.2.3 Metal Substrates:** Metal substrates must be a minimum No. 22 gage galvanized steel [0.030-inch-thick (0.76 mm)] deck. Metal decks must be cleaned of any material that would inhibit bonding of the primer/sealer. Gaps in end laps and sidelaps must be sealed with an approved sealant in accordance with the manufacturer's published installation instructions.

## 4.3 Roof Slope:

The insulation may be spray-applied to form the required roof slope having a minimum slope of  $1\frac{1}{4}$ :12 (2 percent) and a maximum slope as specified in Table 1.

## 4.4 Application:

**4.4.1 Primer:** The SWD Quik-Shield® | 1000 and SWD Quik-Shield® | 2000 primers described in Section 3.5 are applied at the rate of  $\frac{1}{2}$  gallon (1.89 L) per 100 square feet (9.29 m<sup>2</sup>) to concrete and steel substrates and optionally to plywood substrates. The primer is applied at a minimum ambient temperature of 50°F (10°C) and allowed to dry for a minimum of two hours prior to the application of the foam plastic insulation (one hour in hot and dry temperatures). The primer must not be applied when the substrate is wet or damp or when dew, condensation, precipitation, or freezing temperatures are expected prior to, during or immediately after completion of the foam and coating application.

**4.4.2 Spray-applied Foam Plastic Insulation:** The SWD Quik-Shield® | 125 insulation is applied at a 1:1 ratio by volume of the A and B components to one of the substrates described in Section 4.2.1, 4.2.2 or 4.2.3, using equipment recommended by SWD Urethane. Application of the insulation must be performed when the substrate and ambient temperature is at least 50°F (10°C) and when the wind speed does not exceed 15 miles per hour (24 km/h). The insulation must not be installed when the substrate is wet or damp or when dew, condensation, precipitation, or freezing temperatures are expected immediately before, during or immediately after completion of the foam and coating application.

The insulation is spray-applied in one or more  $\frac{1}{2}$ -inch-thick to 2-inch-thick (12.7 mm to 51 mm) passes, to reach a minimum thickness of 1 inch (25.4 mm) on wood substrates or  $1\frac{1}{2}$  inches (38 mm) on concrete or metal substrates, and a maximum thickness of 4 inches (102 mm). The total finished thickness must be achieved within 24 hours.

**4.4.3 Coating:** After the insulation has sufficient strength to support foot traffic, no less than 2 hours nor more than 72 hours after application of the insulation, the

SWD Quik-Shield® | 1929F coating must be brushed, rolled on, or spray-applied directly to the SWD Quik-Shield® | 125 foam plastic insulation. SWD Quik-Shield® | 1929F is applied at the rate specified in Table 1. If the insulation surface is damaged to the extent that cracks, voids or large depressions appear, additional insulation must be applied to create a uniform surface. The first coat must be fully cured before the second coat is applied. The coating must only be applied when the foam plastic insulation surface is dry and free of all damage, dirt and foreign material. The coating must not be applied when dew, condensation, precipitation or freezing temperatures are anticipated immediately before, during, or immediately after completion of the coating application. The ambient temperature must be at least 50°F (10°C) during application of the coating, and above 32°F (0°C) for a 24-hour period after application.

## 4.4.4 Surfacing:

**4.4.4.1 Surfacing with SWD Quik-Shield® | 1929F Acrylic Coating:** The coated foam roof system must have a top coat surfacing consisting of SWD Quik-Shield® | 1929F acrylic coating with No. 9 or No. 11 ceramic granules, as shown in Table 1. The granules are applied either on top of the wet base coat or on top of the wet top coat at 40 lbs per 100 square feet.

**4.4.4.2 Surfacing with SWD Quik-Shield® | Cementitious Roof Mix (Optional):** The SWD Quik-Shield® | Cementitious Roof Mix may be applied over the coated foam roof system, as shown in Table 1. The foam and acrylic coating must be cured and dry prior to application of the cementitious coating.

The cementitious batch consists of 4 $\frac{1}{2}$  gallons (17 L) of water added to 40 pounds (18 kg) of SWD Quik-Shield® | Dry Roof Cementitious Mix,  $\frac{1}{2}$  gallon (1.9 L) of SWD Quik-Shield® acrylic resin and  $\frac{3}{4}$  ounce (22 mL) of SWD Quik-Shield® acrylic emulsion. The batch slurry is applied on top of the coated foam roof system with 64 pounds (29 kg) of white No. 6 crushed limestone, and is applied at a rate of one batch per 100 square feet (9.3 m<sup>2</sup>) to a 40 mil (1 mm) thickness.

## 4.5 Fire Classification:

**4.5.1 New Construction:** The roof covering systems, when installed in accordance with this report, have the roof classifications described in Table 1.

**4.5.2 Reroofing:** Prior to installation of new roof coverings, inspection in accordance with with 2015 IBC Section 1511 (2012, 2009 and 2006 IBC Section 1510) or 2015 IRC Section R908 (2012, 2009 and 2006 IRC Section R907), and approval from the code official having jurisdiction, are required. The resulting classification is the lower of the new and existing roofing classification. Installation of the new coated foam roofing system must be over existing uninsulated systems only.

## 4.6 Wind Resistance:

The allowable wind uplift pressure for the coated foam plastic roof covering is limited to that permitted by the code for the sheathing and framing.

## 5.0 CONDITIONS OF USE

The SWD Quik-Shield® | 125 coated foam roofing system 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 Installation of the roof covering system 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 SWD Urethane.
- 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 rupture 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 or 2015, 2012 and 2009 IRC Section R316.4 (2006 IRC Section R314.4), as applicable.
- 5.5 The deck and supporting structure to which the roof covering is applied must be designed to withstand the applicable wind pressures determined in accordance with ASCE 7.
- 5.6 Flashing must be installed as required by the applicable code.
- 5.7 Use of the foam plastic insulation as a vapor retarder is outside the scope of this report. A vapor retarder must be installed as required by the applicable code.
- 5.8 The polyurethane foam plastic insulation components and the roof coating are manufactured in Mesa, Arizona, 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), revised April 2016.

- 6.2 Reports of physical property tests on SWD Quik-Shield® | 1929F in accordance with ASTM D6083.
- 6.3 Reports of weathering tests in accordance with IBC Section 1504.6.
- 6.4 Reports of impact resistance tests in accordance with Section 5.5 of FM 4470.
- 6.5 Reports of roof classification tests in accordance with ASTM E108 and UL 790.
- 6.6 Reports of wind resistance tests in accordance with FM 4470.
- 6.7 Reports of surface-burning characteristics tests in accordance with ASTM E84 and UL723.

**7.0 IDENTIFICATION**

- 7.1 Each container of the SWD Quik-Shield® | 125 components, SWD Quik-Shield® | 1929F coating, SWD Quik-Shield® | Cementitious Roof Mix, and SWD Quik-Shield® | 1000 and SWD Quik-Shield® | 2000 primers, must bear a label with the SWD Urethane name and address, product designation, the evaluation report number (ESR-2532), date of manufacture, shelf life and batch number. Additionally, the label for the B component of the polyurethane foam plastic insulation must include the flame-spread index and the density.
- 7.2 The report holder’s contact information is the following:

**SWD URETHANE**  
**540 SOUTH DREW STREET**  
**MESA, ARIZONA 85210**  
**(800) 828-1394**  
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**TABLE 1—ROOF COVERING SYSTEM FIRE CLASSIFICATION**

System Number and Roofing Classification	Polyurethane Insulation			Coating and Application Rate (gal. per 100 sq. ft) <sup>3</sup>				Maximum Roof Slope	Substrate <sup>1</sup>
	Product <sup>3</sup> Name	Density (pcf)	Thickness (inches)	Base Coat	Interim Coat (optional)	Top Coat	Surface Coat		
1. Class A	QS   125	2.5 to 3.0	1½ to 4	QS   1929F (1.0)	QS   1929F (1.0)	QS   1929F (1.0 to 2.0)	Granules <sup>2</sup>	Unlimited	Noncombustible
2. Class A	QS   125	2.5 to 3.0	1 to 4	QS   1929F (1.0)	QS   1929F (1.0)	QS   1929F (1.0 to 2.0)	Granules <sup>2</sup>	Unlimited	Metal or Plywood
3. Class B	QS   125	2.5 to 3.0	1 to 4	QS   1929F (1.0)	QS   1929F (1.0)	QS   1929F (1.0 to 2.0)	Granules <sup>2</sup>	2:12	Plywood
4. Class A	QS   125	2.5 to 3.0	1 to 4	QS   1929F (1.0)	–	QS   1929F (1.0)	SWD Quik-Shield Cementitious Roof Mix <sup>4</sup>	Unlimited	Plywood

For SI: 1 mil = 0.0254 mm, 1 pound/100 square feet = 0.0488 kg/m<sup>2</sup>, 1 oz./yd<sup>2</sup> = 33.905 g/m<sup>2</sup>, 1 gal/100 feet<sup>2</sup> = 0.41 l/m<sup>2</sup>.

<sup>1</sup>Substrates must comply with Section 4.2 of this report.

<sup>2</sup>No. 9 or No. 11 ceramic granules, applied while the coating is wet, embedded in the top coat, at a rate of 40 lbs/100ft<sup>2</sup>.

<sup>3</sup>QS | 125 refers to SWD Quik-Shield | 125 roof foam plastic insulation, QS | 1929F refers to SWD Quik-Shield | 1929F acrylic roof coating. The foam plastic insulation and roof coating must be UL classified.

<sup>4</sup>Must follow the SWD Urethane mixing instructions and Section 4.4.4.2, of this report. River rock or slag approved application can replace cementitious roof mix for this classification.