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ICC-ES Evaluation Report

ESR-3392

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

REPORT HOLDER:

NCFI POLYURETHANES

EVALUATION SUBJECT:

**ENDURATECH™ PREMIER ROOFING SYSTEM
(COATED SPRAY POLYURETHANE FOAM-ROOFING SYSTEM)**



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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2012 and 2009 *International Building Code*® (IBC)
- 2012 and 2009 *International Residential Code*® (IRC)
- 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
- Impact resistance
- Wind resistance
- Fire classification
- Elimination of thermal barrier

2.0 USES

The EnduraTech™ Premier Roofing System described in this evaluation report is 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:

The EnduraTech™ Premier Roofing System consists of NCFI 10-011 spray polyurethane foam (SPF) plastic insulation covered with EnduraTech™ R or EnduraTech™ Q acrylic elastomeric coating. 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: NCFI 10-011 plastic insulation as formulated has a density between 2.5 and 3.0 pcf

(40 and 43 kg/m³). The liquid components (designated as component A and component R) are available in 55-gallon (208 L) containers and 275-gallon (1041 L) totes. The liquid components must be stored at temperatures between 70°F (21°C) and 90°F (32°C) for several days before application and must not be exposed to direct sunlight. The shelf life of NCFI 10-011 liquid components is six months in unopened containers.

3.2.2 Surface-burning Characteristics: NCFI 10-011 plastic insulation has a flame-spread index of 25 or less for densities up to 3.0 pcf (43 kg/m³) when tested in accordance with UL 723 (ASTM E84) at a maximum thickness of 4 inches (102 mm). The classified roof assemblies noted in Table 1 are recognized for use without a thermal barrier based on testing in accordance with UL 1256, which is specified in IBC Section 2603.4.1.5.

3.3 Coatings:

EnduraTech™ R and EnduraTech™ Q Acrylic Elastomeric Coatings: EnduraTech™ R (Standard) and EnduraTech™ Q (Quickset) acrylic elastomeric coatings are single-component, liquid-applied, 100 percent acrylic coatings complying with ASTM D6083. The coatings are available in 5-gallon (19 L), 55-gallon (208 L) and 275-gallon (1041 L) totes, and have a shelf life of 12 months when stored in factory-sealed containers at temperatures between 60°F (15.5°C) and 110°F (44°C).

3.4 Impact and Foot Traffic Resistance:

The coated foam roof coverings described in this report meet requirements of the Resistance to Foot Traffic Test described in Section 5.5 of FM 4470, as referenced in IBC Section 1504.7.

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 that would impair adhesion of the foam to the substrate. Gravel-surfaced roofs must be cleaned by vacuuming or other suitable means to remove any loose gravel and dirt before application of the insulation. Areas not receiving an application of insulation must be masked off or otherwise protected from overspray.

4.2 Substrates:

4.2.1 Wood Substrates: Wood substrates must be minimum ¹⁵/₃₂-inch-thick (11.9 mm), code-complying, exterior grade or Exposure 1 wood structural panels. All wood structural panel substrate edges must be supported by blocking or have tongue-and-groove joints as required

by IBC Section 2603.4.1.5 or IRC Section R314.5.2, as applicable. The wood surface must be primed, when specifically required, in accordance with the NCFI installation instructions.

4.2.2 Noncombustible Substrates:

4.2.2.1 Concrete Substrates: Structural concrete 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]. The concrete substrate must be thoroughly cured and primed or otherwise treated in accordance with NCFI installation instructions to ensure adequate adhesion.

4.2.2.2 Metal Substrates: Metal substrates must be a minimum of No. 22 gage [0.03 inch thick (0.76 mm)] galvanized steel 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 NCFI installation instructions.

4.3 Roof Slope:

The insulation is spray-applied to roofs that have a minimum slope of $\frac{1}{4}$:12 (2 percent) and a maximum slope as specified in Table 1.

4.4 Foam Plastic Insulation Application:

NCFI 10-011 liquid components must be dispensed at a 1:1 ratio at the temperature and pressure specified in the manufacturer's installation instructions. The liquid components must be applied to the prepared substrate in passes that have thicknesses between $\frac{1}{2}$ inch and $1\frac{1}{2}$ inches (12.7 mm to 38 mm). Application of the foam plastic insulation must be performed in accordance with ambient-temperature, humidity and wind-speed requirements noted in the manufacturer's published installation instructions. The foam insulation must not be applied to wet or damp substrates, or when dew, condensation, precipitation, or freezing temperatures are expected prior to completion of application of the foam and coating. The finished foam surfaces must be smooth and free of voids, pinholes and crevices.

4.5 Coating Application:

The coating is applied to the foam substrate at the application rate specified in Table 1, in multiple passes of contrasting colors up to the thickness prescribed in NCFI's Installation Guide Specifications. The coating must be applied no less than two hours nor more than 72 hours following the application of the spray foam insulation. The insulation must be dry and free of dirt and foreign material when the coating is applied. The base coat must be applied the same day as the insulation unless a deviation from this requirement is specifically approved by NCFI. The coating must be cured for a sufficient time as specified in NCFI's installation instructions before subsequent layers are applied. 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 Wind Resistance:

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

4.7 Reroofing:

Prior to installation of new roof coverings, inspection in accordance with IBC Section 1510 or IRC Section R907, and approval from the code official having jurisdiction, are required. Installation must be over uninsulated systems only. Prior to installation of the spray-applied foam plastic insulation, the roof surface must be prepared to assure adequate adhesion. All loose rock, cementitious coatings, peeling paint, dirt and debris must be removed by brooming, power vacuuming or wire brushing. Where the existing roof covering is removed to the substrate, the deck is prepared as set forth in Section 4.2.1, 4.2.2.1 or 4.2.2.2.

5.0 CONDITIONS OF USE

The EnduraTech™ Premier 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 The installation and application of the EnduraTech™ Premier roof covering system must comply with the applicable 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 NCFI Polyurethanes.
- 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 deck and supporting structure to which the EnduraTech™ Premier Roofing System is applied must be designed to withstand the applicable wind pressures determined in accordance with ASCE 7.
- 5.5 Flashing must be installed in accordance with IBC Section 1503.2 or IRC Section R903.2, as applicable.
- 5.6 The NCFI 10-011 plastic insulation is manufactured in Mount Airy, North Carolina, and Clearfield, Utah, under a quality control program with inspections by ICC-ES.

EnduraTech™ R and EnduraTech™ Q acrylic elastomeric coatings are manufactured in Scottsdale, 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), dated April 2016.
- 6.2 Reports of testing in accordance with ASTM D6083.
- 6.3 Reports of "Resistance to Foot Traffic" testing in accordance with Section 5.5 of FM 4470.
- 6.4 Reports of testing in accordance with UL 723.
- 6.5 Reports of testing in accordance with UL 790.
- 6.6 Reports of testing in accordance with UL 1256.

7.0 IDENTIFICATION

- 7.1 Containers of NCFI 10-011 liquid components are labeled with the manufacturing date, the NCFI Polyurethanes name and address, the product name

(NCFI 10-011), the component type (A or R), the lot numbers, the flame spread index, the evaluation report number (ESR-3392).

Containers of EnduraTech™ R and EnduraTech™ Q liquid-applied coatings are labeled with the NCFI Polyurethanes name and address, the product name, the lot number, the evaluation report number (ESR-3392).

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

NCFI POLYURETHANES
POST OFFICE BOX 1528
MOUNT AIRY, NORTH CAROLINA 27030
(800) 346-8229
www.ncfi.com

TABLE 1—ENDURATECH™ PREMIER ROOF COVERING SYSTEM FIRE CLASSIFICATION

SYSTEM NO. ¹	ROOF DECK TYPE	FOAM PLASTIC INSULATION		COATING		TOP SURFACING	MAXIMUM ROOF SLOPE	ROOF CLASSIFICATION
		Product Designation	Minimum Thickness (inches)	Type	Application Rate			
1	Noncombustible	10-011	1	EnduraTech™ R or Q	Two applications at 1.75–1.85 gal/sq./coat	None	1:12	A
2	Noncombustible	10-011	1	EnduraTech™ R or Q	3.7 gal/sq., maximum	No. 11 roofing granules at 45 lbs/sq.	4:12	A
3	Minimum 15/32"-thick plywood	10-011	1.5	EnduraTech™ R or Q	3.7 gal/sq., maximum	No. 11 roofing granules at 45 lbs/sq.	1/2:12	B

For SI: 1 inch = 25.4 mm.

¹ Roof covering systems may be applied over an existing uninsulated roof covering without changing the existing roof covering’s fire classification.

ICC-ES Evaluation Report

ESR-3392 FBC Supplement

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1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the EnduraTech™ Premier Roofing System, recognized in ICC-ES master report ESR-3392, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2010 *Florida Building Code—Building*
- 2010 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The EnduraTech™ Premier Roofing System, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3392, complies with the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential*, provided the design and installation are in accordance with the *International Building Code*® provisions noted in the master report.

Use of the EnduraTech™ Premier Roofing System for compliance with the High-Velocity Hurricane Zone provisions of the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this evaluation report.

For products falling under Florida Rule 9N-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 master report, reissued June 2018.