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APPROVAL REPORT

NCFI 10-011 SPRAY POLYURETHANE FOAM IN CLASS 1 ROOF ASSEMBLIES

Prepared for:

**NCFI Polyurethanes
PO Box 1528
Mount Airy, NC 27030-1528**

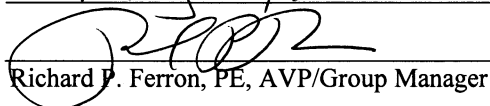
Project ID: 3035470

Class: 4470/4880

Date of Approval:

May 7, 2009

Authorized by:


Richard P. Ferron, PE, AVP/Group Manager

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from

**NCFI POLYURETHANES
PO BOX 1528
MOUNT AIRY, NC 27030-1528**

I INTRODUCTION

- 1.1 NCFI Polyurethanes submitted their NCFI 10-011 spray polyurethane foam to determine if it meets the approval requirements of the **Standards** listed below for use in selected Class 1 roof deck constructions.
- 1.2 This Report may be reproduced only in its entirety and without modification.
- 1.3 **Standards:**

Title	Class Number	Date
Class 1 Roof Covers	4470	April, 1986
Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems	4880	October, 2005

- 1.4 All testing was conducted under FM Approvals project IDs 3003060, 3016938 and 3022955 sponsored by the Spray Polyurethane Foam Alliance (SFPA) and released for use in this program. Examination included ASTM E-108 Exterior Flame Spread Tests, Simulated Wind Uplift Pull Tests, Severe Hail Tests, Apparent Density and Resistance to Foot Traffic.
- 1.5 Tests show that NCFI 10-011 spray polyurethane foam, as tested, meets the Approval requirements of the **Standards** listed above.
- 1.6 **Listings:** The tested constructions meet the Approval criteria of FM Approvals when installed as specified in the **CONCLUSIONS** of this report and will be listed in RoofNav.

II DESCRIPTION

- 2.1 NCFI 10-011 spray polyurethane foam is spray insulation for use in Approved roof constructions. The foam has an apparent overall density of 2.9 to 3.5 lb/ft³ (47 to 56 kg/m³) and requires an Approved liquid applied roof cover to be applied to the top surface. It consists of an A component (isocyanate) and a R component (polyol) that are shipped to the job site in separate containers and mixed on site using special spray equipment for application to the roof.
- 2.2 Proprietary formulations, specifications, and drawings are on file at FM Approvals.

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III EXAMINATIONS AND TESTS

Tests conducted were as required by FM Approvals Standard 4470 (1986) - Class 1 Roof Covers and Standard 4880 (1994) - Class 1 Insulated Roof/Ceiling Panels.

IV MARKING

- 4.1 The manufacturer shall mark each container with the manufacturer's name and product trade name. In addition, the container must be marked with the Approval Mark of FM Approvals.
- 4.2 Markings denoting Approval by FM Approvals shall be applied by the manufacturer only within and on the premises of manufacturing location that is under the FM Approvals Facilities and Procedures Audit (F&PA) program.
- 4.3 The manufacturer agrees that use of the FM Approvals name or Approval Mark is subject to the conditions and limitations of the Approval by FM Approvals. Such conditions and limitations must be included in all references to Approval by FM Approvals.

V REMARKS

- 5.1 The securement of the roof system must be enhanced at the building corners and perimeter as outlined in FM Global Property Loss Prevention Data Sheet 1-29.
- 5.2 The roof cover must be installed using a roof perimeter flashing system Approved by FM Approvals—see RoofNav.

VI FACILITIES AND PROCEDURES AUDITS

The NCFI Polyurethanes manufacturing facilities in Clearfield, UT and Mount Airy, NC are subject to periodic audit inspections to determine that the quality and uniformity of the materials have been maintained and will provide the same level of performance as originally Approved by FM Approvals. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII MANUFACTURER'S RESPONSIBILITIES

- 7.1 To ensure compliance with his procedures in the field, the manufacturer shall supply to the roofer with necessary instruction or assistance required to produce the desired performance achieved in the tests.
- 7.2 The manufacturer shall notify FM Approvals of any planned change in the Approved products, prior to general sale or distribution, using Form 797, Approved Product Revision Report.

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VIII DOCUMENTATION

No new critical documents were created as a result of this project due to all components being already Approved by FM Approvals.

IX CONCLUSIONS

9.1 Test results show that NCFI 10-011 spray polyurethane foam meets the requirements of FM Approvals Standard 4470 (April 1986) and 4880 (October, 2005) when installed as follows:

Roof Covers:	Aldo Products Aldocoat 374; Isothermal Protective Coatings Acrylink G, National Coatings AcryShield A400FR, National Coatings AcryShield A500, or National Coatings AcryShield A550. See RoofNav for other Approved covers
Substrate:	NCFI 10-011 spray polyurethane foam
Application:	refer to cover manufacturer for details
Hail Rating:	Class 1-MH for Aldo Products Aldocoat 374; Isothermal Protective Coatings Acrylink G, National Coatings AcryShield A400FR, National Coatings AcryShield A500, or National Coatings AcryShield A550. See RoofNav for hail ratings of other approved covers
ASTM E 108 Rating:	Class A noncombustible deck ratings at the following roof slopes: 3 in 12 Aldo Products Aldocoat 374 3 in 12 Isothermal Protective Coatings Acrylink G 1.5 in 12 National Coatings AcryShield A400FR 1.5 in 12 National Coatings AcryShield A500 1.5 in 12 National Coatings AcryShield A550

Construction #1: Recover. Max 3 in. (76 mm) thick NCFI 10-011 is applied to one of the following existing Approved roof constructions and covered with a roof cover shown above. Meets wind classification of the existing roof, max Class 1-180.

Existing Roof #1: 1.5 to 2 in. (40 to 50 mm) thick fiberglass roof insulation is secured to the steel deck with mechanical fasteners or ribbons of asphalt applied at 12 to 15 lb/sq (0.6 to 0.7 kg/m²) and covered with a three-ply organic felt, asphaltic BUR.

Existing Roof #2: 2 to 4 in. (50 to 102 mm) thick perlite roof insulation is secured to the steel deck with mechanical fasteners or ribbons of asphalt applied at 12 to 15 lb/sq (0.6 to 0.7 kg/m²) and covered with a three-ply organic felt, asphaltic BUR.

Construction #2: Recover. Max 1 in. (25 mm) thick NCFI 10-011 is applied to an existing Approved, Class 1 rated roof and covered with a roof cover shown above. Meets wind classification of the existing roof.

Construction #2a: Existing Asphaltic BUR. Meets max Class 1-180.

Construction #2b: Existing Approved, Class 1 rated insulated metal panel roof. Meets max Class 1-90.

Construction #3: Structural Concrete Recover. Max 3 in. (76 mm) thick NCFI 10-011 is applied to an existing Approved asphaltic BUR and covered with a roof cover shown above. Meets wind classification of the existing roof, max Class 1-270.

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Construction #4: Structural Concrete, New. The deck is primed (optional) with an Approved asphaltic concrete deck primer or covered with a one or two ply asphaltic vapor barrier. Max 3 in. (76 mm) thick NCFI 10-011 is applied and covered with a roof cover shown above. Meets Class 1-990.

Construction #5: Steel (FOR USE WITH NONCOMBUSTIBLE WALLS ONLY). Painted or galvanized steel deck is secured to min 1/4 in. (6 mm) supports with Buildex Tekes 4 or Tekes 5 fasteners at 6 in. (152 mm) o.c. (every rib), maximum span 6 ft (1.8 m). Side laps are secured with Buildex Tekes 1 fasteners maximum 30 in. (762 mm) o.c. Deck is washed with a trisodium phosphate (TSP) and water solution, rinsed and allowed to dry. NCFI 10-011 spray polyurethane foam is applied to the deck at a thickness of 1-6 in. (25-152 mm) over the deck top flange and coated with one of the above roof covers. Meets Class 1-210.

Construction #5a: Steel (FOR USE WITH NONCOMBUSTIBLE WALLS ONLY). FM Approved painted or galvanized steel deck is secured per Approval requirements, maximum span 6 ft (1.8 m). Roof assembly is the installed per Construction 5. Meets wind classification of roof deck securement, maximum Class 1-90.

- 9.2 See RoofNav for the Approved assemblies.
- 9.3 Tests show that the tested roof constructions in and of themselves would not create a need for automatic sprinklers.
- 9.4 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the date of this report.
- 9.5 Continued Approval will depend upon satisfactory field experience and periodic Facilities and Procedures Audits.

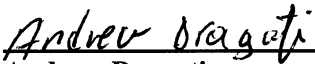
TESTING SUPERVISED BY: M. Slocumb

PROJECT DATA RECORD (PDR): 3035470

ORIGINAL TEST DATA: PDR for Project IDs 3003060, 3016938, 3022955

ATTACHMENTS: none

REPORT BY:



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