APPROVAL REPORT

APPROVAL TESTING OF SINTOFOIL RC/FR MECHANICALLY ATTACHED ROOF COVER PER FM APPROVALS STANDARD 4470

Prepared for:

Imper Italia, SpA
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Italy

Project ID: 3047326
Class: 4470
Date of Approval: 12/14/2012
Authorized by: Cynthia E Frank

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from

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I INTRODUCTION

1.1 Imper Italia S.p.A. submitted their Sintofoil RC/FR roof cover to determine if it meets the approval requirements of the **Standard** listed below for Class 1 steel deck roof assemblies.

1.2 This Report may be reproduced only in its entirety and without modification.

1.3 **Standard:**

Title	Class Number	Date
Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction	4470	June 2012

1.4 Examination included 12 x 24 ft (3.7 x 7.3 m) Simulated Wind Uplift, testing. See Section 3.1.1 for testing waived. Previous Approval had been granted to the Sintofoil RC/FR roof cover in selected assemblies. See 3002938 for details.

1.5 Tests show that the Sintofoil RC/FR roof cover installed, as tested, meets the Approval requirements of the **Standard** listed above for Class 1 roof covers.

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 Sintofoil RC/FR is manufactured at a thickness of 0.048 in. (1.2 mm) and a width of 59 in. (1.5 m) with a grey top surface and a black bottom surface. Sintofoil RC/FR is a fiberglass reinforced TPO formulation single ply roof cover.

2.2 All other products are as described in RoofNav. Proprietary formulations, specifications and drawings are on file at FM Approvals.

III EXAMINATIONS AND TESTS

3.1 Samples were submitted for examination and testing as follows:

3.1.1 Testing was conducted as required by the **Standard** listed in paragraph 1.3 above. Several tests were waived see table below:

Sintofoil RC/FR	
Testing Waived:	**Project ID:**
Combustibility From Above the Roof Deck	3002938
Combustibility From Below the Roof Deck	2Y5A4.AM
Susceptibility to Heat Damage**	Various
Wind Uplift Resistance	Not Waived
Hail Damage Resistance	3002938
Water Leakage Resistance	3002938
Foot Traffic Resistance	3002938
Corrosion Resistance*	Various

* All fasteners are Approved by the OEM.
** All insulations are Approved by the OEM.

3.1.2 All other materials were produced under the FM Approvals Facilities and Procedures Surveillance Audit Program as indicated by FM Approvals labels.

3.1.3 All samples were considered to be representative of standard production and were examined and tested as indicated below.

3.1.4 All components incorporated into test samples were selected by FM Approvals personnel. Test samples were prepared by, or under the supervision of, FM Approvals personnel.

3.2 <u>FM Approvals 12 x 24 ft (3.7 x 7.3 m) Simulated Wind Uplift Pressure Test</u>

3.2.1 The test was conducted using the FM Approvals Uplift Pressure Test Apparatus to evaluate the ability of the above deck components of the roofing system to resist a minimum simulated wind uplift pressure of 60 psf (2.9 kPa) without failure of the assemblies.

3.2.2 The simulated wind uplift pressure test utilizes a 24 ft. (7.3 m) long by 12 ft. (3.7 m) wide by 3 in. (76 mm) deep steel pressure vessel arranged to apply air pressure at a pre-established standard rates to the underside of the test sample which formed the top of the pressure vessel. The vessel was pressurized with compressed air.

3.2.3 A net pressure of 30 psf (1.4 kPa) was applied to the test sample and maintained for 1 minute. The pressure was increased to 45 psf (2.2 kPa), then to 60 psf (2.9 kPa) and held for 1 minute at each increment. The pressure was increased in increments of 15 psf (0.7 kPa) every minute until failure occurred.

3.2.4 One 12 x 24 ft (3.7 x 7.3 m) sample was prepared. The components, sequence of installation and test result was as follows:

Test Sample No.1:

- FM Approved 22 ga., steel deck secured to the ¼ in. (6 mm) thick steel deck supports with TRAXX/5 fasteners installed 6 in. (152 mm) on center. The supports were 6 ft. (1.8 m) o.c. Deck side laps were secured 24 in. (610 mm) on center with TRAXX/1 fasteners.
- 2.0 in. (51 mm) thick TR 27 roof insulation installed loose.
- Sintofoil RC/FR roof cover mechanically attached with ASAP Plastic Plate and the OMG XHD screw installed 6.0 in. (127 mm) o.c. in laps spaced 54 in. (1.3 m) o.c. The laps are sealed with a 2.0 in. (51 mm) wide heat weld.

Test Results:
Test sample met the 105 psf (5.0 kPa) minimum FM Approvals requirement for Class 1-105 Windstorm Classification. The test sample failed after 24 seconds at the next pressure level due to fracturing of the roof cover. Due to deck stress limitations this assembly is limited to a maximum deck span of 5.5 ft (1.6 m).

IV MARKING

4.1 The manufacturer shall mark each roll or roll wrapper with the manufacturer's name and product trade name. In addition, the roll or roll wrapped 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 Surveillance 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 SURVEILLANCE AUDITS

The Imper Italia S.p.A. manufacturing location in Torino, Italy is 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. The facility 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 such 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.

VIII DOCUMENTATION

The following document describes the Approved products and is filed under Project ID 3047326.

Document	Issue or Revision	Description
Audit Manual	November 2012	Appendix A – Reports

IX CONCLUSIONS

9.1 Test results from this and previous programs indicate that the Sintofoil RC/FR roof cover meets the requirements of FM Approvals Standard 4470 (April 2010) for Class 1 roof covers when installed when installed as follows:

9.1.1 Steel (New): Approved, min 22 ga. [0.0295 in (0.75 mm)] steel deck secured to supports 5.5 ft (1.6 m) o.c. with ITW Buildex ICH Traxx/5 fasteners 6 in. (152 mm) o.c. Side laps secured with ITW Buildex ICH Traxx/1 fasteners at 24 in. (610 mm) o.c. Optional 6 mil. (0.006 in.) thick polyethylene vapor retarder installed loose with 2.0 in. (51 mm) wide laps. An insulation previously Approved with the Sintofoil roof cover (see RoofNav) is presecured. Sintofoil RC/FR roof cover mechanically attached with ASAP Plastic Plates and OMG XHD Screws installed 6 in. (152 mm) o.c. in rows spaced 54 in. (1.3 m). The 5 in. (127 mm) wide laps are sealed with a 2.0 in. (51 mm) wide heat weld. Class A at 1 in 12. Class 1 SH, Meets 1-105 Wind Classification.

9.1.2 Same as above except Approved, min 20 or 18 ga. [0.0359 in (0.91 mm) or 0.0478 in. (1.214 mm)] steel deck secured to supports 6.0 ft (1.8 m) o.c.

9.2 Tests show that the tested roof constructions in and of themselves would not create a need for automatic sprinklers. Refer to RoofNav for details of all assemblies including ASTM E108 ratings.

9.3 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the date of this report.

9.4 Continued Approval will depend upon satisfactory field experience and periodic Facilities and Procedures Surveillance Audits.

TESTING SUPERVISED BY: David L. Alves

PROJECT DATA RECORD: Project ID 3047326

ORIGINAL TEST DATA: 3002938 and 2Y5A4.AM

REPORT BY:

D.L. Alves
Senior Engineer - Materials Group

REPORT REVIEWED BY:

P.J. Smith P.E., Asst. Vice President,
Technical Team Manager
Materials Group

FM APPROVED

Certificate of Compliance

This certificate is issued for the following:

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Prepared for:

Imper Italia S.p.A.
Via Volta 8, Frazione Mappano
Borgaro, Torino
Ultaly

FM Approvals Class: 4470

Approval Identification: 3047326 Approval Granted: December 14, 2012

Said Approval is subject to satisfactory field performance, continuing follow-up Facilities and Procedures Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

For more than 160 years FM Approvals has partnered with business and industry to reduce property losses.

Cynthia E Frank

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FM Approvals

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