

Not to be distributed outside of FM Approvals and its affiliates except by Customer

APPROVAL REPORT

Project No: PR449631
Class: 4470
Product Name: MonoTop, MonoBase & Tietex T272
Name of Listing Company: Agua-Seal Waterproofing Systems USA LLC
Address of Listing Company: 3609 River Road
Johns Island, SC 29455
United States
Customer ID: 251714-1
Customer website: <http://aguaseal.net/>

Prepared by

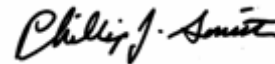


Christian Lopez
Engineer

Reviewed by



Joanna Blaney
AVP, Technical Team Manager, Materials



Phillip J. Smith
VP, Manager of Materials

12/20/19

Date of Approval

1 INTRODUCTION

1.1 Agua-Seal Waterproofing Systems USA LLC requested Approval of their MonoTop, MonoBase & Tietex T272 to determine if they meet the Approval requirements of the standard listed in Section 1.3.

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

1.3 Standard

Title	Number	Issue Date
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	12/2016

1.4 Listing

The products and assemblies will be listed in RoofNav, an on-line resource of FM Approvals. Formulations, drawings and specifications are on file at FM Approvals.

2 DESCRIPTION

The MonoTop, MonoBase & Tietex T272 products are described as follows:

2.1 COVER, LIQUID APPLIED (TOP COAT)

Trade Name:	MonoTop
Number of Coats:	3
Material:	Acrylic
Min App Rate per Coat Wet:	2/3 gals/sq [0.27/m ²]

2.2 COVER, LIQUID APPLIED (BASE COAT)

Trade Name:	MonoBase
Number of Coats:	1
Material:	Acrylic
Min App Rate per Coat Wet:	1.25 gals/sq [0.51/m ²] (11 mils wet)

2.3 COVER, MULTI-PLY

Trade Name:	Tietex T272
Width:	40 in (1 m)
Reinforcement:	Polyester
Comments:	Also available in 6, 12, and 20 in (152, 305 and 508 mm) widths

2.4 All other products are as described in RoofNav.

3 EXAMINATIONS AND TESTS

- 3.1** All components, except those in Sections 2.1 – 2.3, were produced under the FM Approvals Surveillance Audit program as indicated by FM Approvals labels. All samples were considered to be representative of standard production and were examined and tested as indicated below. Components incorporated into test samples were selected by FM Approvals personnel. Test samples were prepared by, or under the supervision of, FM Approvals personnel. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.
- 3.2** Several performance requirements and tests required by the Standard have been waived due to previous successful testing. See Table 1 below for details.

Table 1

FM Standard 4470 Performance Requirement	Original Project ID(s)
Combustibility From Below the Roof Deck	Waived, no added insulation to recover. Approvals are only recover assemblies.
Combustibility From Above the Roof Deck	Included
Wind Uplift Resistance	Included
Hail Damage Resistance Test	Included
Water Leakage Resistance Test	Included
Foot Traffic Resistance Test	Included
Susceptibility to Heat Damage Test	Waived ¹
Corrosion Resistance Test	Waived ²
Identification Test	Waived ³

¹ No insulations are used

² No fasteners are used

³ These types of products are currently not applicable for this testing.

3.3 FM Approvals Combustibility - From Above Roof Assembly

- 3.3.1** Two (2) ASTM E108, Spread of Flame Tests were completed with the sample constructions and results noted below.

Sample 1 & 2

Top Coat:	Three (3) coats of MonoTop applied at a total of 2 gal/sq [0.81 L/m ²] (18 mils wet) (each coat is 2/3 gals/sq [0.27/m ²])
Coat:	One (1) of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Reinforcement:	Tietex T272, laid directly into wet base coat
Base Coat:	One (1) coat of MonoBase applied at 1.254 gal/sq [0.51 L/m ²] (11.25 mils wet)
Existing Roof	BITEC SFM-3.5H, applied in hot asphalt at 25 lbs/sq [10.2 L/m ²]. Two plies of Ply IV, applied in hot asphalt at 25 lbs/sq [10.2 L/m ²]
Deck:	Plywood

Results:

Sample No.	Slope	Class Tested	Max. Flame Spread	Pass/Fail
1	0.25 in 12	A	19 in (482.6 mm)	Pass
2	0.25 in 12	A	23.75 in (603.25 mm)	Pass

3.4 FM Approvals Simulated Wind Uplift Test

- 3.4.1** One (1) 2 x 2 ft (607 x 607 mm) wind uplift test was completed with the sample construction and results noted below.

Sample 1

Top Coat:	Three (3) coats of MonoTop applied at a total of 2 gal/sq [0.81 L/m ²] (18 mils wet) (each coat is 2/3 gals/sq [0.27/m ²])
Coat:	One (1) of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Reinforcement:	Tietex T272, laid directly into wet base coat
Base Coat:	One (1) coat of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Existing Roof	BITEC SFM-3.5H, applied in hot asphalt at 25 lbs/sq [10.2 L/m ²]. Two plies of Ply IV, applied in hot asphalt at 25 lbs/sq [10.2 L/m ²]
Deck:	Structural Concrete

Results: The test sample met the 360 psf (17.2 kPa) minimum requirement for Class 1-360 windstorm classification during testing. The sample failed on the increase to the next pressure level due to delamination between Base Coat and the existing roof.

3.5 FM Approvals Hail Damage Resistance

- 3.5.1** One (1) Hail Damage Resistance Test (Severe Hail) was completed with the sample construction and results noted below.

Sample 1

Top Coat:	Three (3) coats of MonoTop applied at a total of 2 gal/sq [0.81 L/m ²] (18 mils wet) (each coat is 2/3 gals/sq [0.27/m ²])
Coat:	One (1) of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Reinforcement:	Tietex T272, laid directly into wet base coat
Base Coat:	One (1) coat of MonoBase applied at 1.254 gal/sq [0.51 L/m ²] (11.25 mils wet)
Existing Roof	BITEC SFM-3.5H, loose laid – tested over structural concrete

Results: Pass, both initial and conditioned samples showed no cracks or penetrations after testing.

3.6 FM Approvals Water Leakage Resistance Test

- 3.6.1** One (1) Water Leakage Resistance Test was completed with the sample construction and results noted below.

Sample 1

Top Coat:	Three (3) coats of MonoTop applied at a total of 2 gal/sq [0.81 L/m ²] (18 mils wet) (each coat is 2/3 gals/sq [0.27/m ²])
Coat:	One (1) of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Reinforcement:	Tietex T272, laid directly into wet base coat
Base Coat:	One (1) coat of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)

Note:	Applied to polyethylene film and removed prior to testing
-------	---

Results: Pass, there were no signs of water leakage during, or after, the pressure cycle.

3.7 FM Approvals Foot Traffic Resistance Test

3.7.1 One (1) Foot Traffic Resistance Test was completed with the sample construction and results noted below.

Sample 1

Top Coat:	Three (3) coats of MonoTop applied at a total of 2 gal/sq [0.81 L/m ²] (18 mils wet) (each coat is 2/3 gals/sq [0.27/m ²])
Coat:	One (1) of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Reinforcement:	Tietex T272, laid directly into wet base coat
Base Coat:	One (1) coat of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Existing Roof	BITEC SFM-3.5H, loose laid – tested over structural concrete

Results: Pass, there were no signs of tearing or cracking of the assembly causing exposure of the substrate

4 **MARKING**

4.1 Marking on the product or, if not possible due to size, on its packaging or label accompanying the product, shall include the following information:

- name and address of the manufacturer or marking traceable to the manufacturer;
- date of manufacture or code traceable to date of manufacture or lot identification;
- model number, model type and/or product trade name as appropriate.

When hazard warnings are needed, the markings shall be universally recognizable

4.2 The product trade name, model number or model type identification shall correspond with RoofNav, the manufacturer's catalog designation and shall uniquely identify the product as FM Approved. The manufacturer shall not place this trade name or model number identification on any other product unless covered by a separate agreement with FM Approvals.

4.3 The Approval Mark shall be displayed visibly and permanently on the product and/or packaging as appropriate. The manufacturer shall not use this Mark on any other product unless such product is covered by a separate FM Approvals Approval Report.

4.4 Markings denoting Approval by FM Approvals shall be applied by the manufacturer only within and on the premises of manufacturing locations that are under the FM Approvals Surveillance Audit program.

4.5 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.

5 REMARKS

- 5.1 The roof cover must be installed using a roof perimeter flashing system Approved by FM Approvals. See RoofNav.

6 SURVEILLANCE AUDIT

The manufacturing facilities at the following locations shall be visited on a routine basis. The facility processes and quality control procedures in place have been determined to be satisfactory to manufacture products identical to that tested and Approved. An FM Approved Products/Specification-Tested Revision Request Form shall be submitted to FM Approvals for requesting to manufacture products at any additional or alternate manufacturing facilities which are not listed below.

Audit Locations

3609 River Road
Johns Island, SC 29455
United States

3010 N. Blackstock Road
Spartanburg, SC 29304
United States

7 MANUFACTURER'S RESPONSIBILITIES

- 7.1 The manufacturer shall notify FM Approvals of any planned change in the Approved products, prior to general sale or distribution, using the FM Approved Products/Specification-Tested Revision Request Form. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from FM Approvals.
- 7.2 To ensure compliance with his procedures in the field, the manufacturer shall supply to the installer such necessary instruction or assistance required to produce the desired performance achieved in the tests.
- 7.3 In accordance with the Master Agreement, the manufacturer shall make full and immediate disclosure to FM Approvals of all information concerning any defect in, or potential hazard of, the product or service manufactured or provided by the Customer which is Approved by, or being examined by, FM Approvals. The manufacturer shall make all necessary arrangements for the investigation of complaints / anomalies applicable to this approval and shall keep records of all complaints / anomalies including actions taken.

8 DOCUMENTATION

The following document describes the MonoTop, MonoBase & Tietex T272 and is on file at FM Approvals.

Document Title	Issue Date
----------------	------------

Surveillance Audit Manual	December 2019
Surveillance Audit Manual	December 2019

9 CONCLUSIONS

9.1 Test results from this program indicate that the submitted products as evaluated, meet the requirements of the FM Approvals Standard listed in section 1.3 when installed as follows:

9.2

Recover Assembly	
Top Coat:	Three (3) coats of MonoTop applied at a total of 2 gal/sq [0.81 L/m ²] (18 mils wet).
Coat:	One (1) of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Reinforcement:	Tietex T272, laid directly into wet base coat
Base Coat:	One (1) coat of MonoBase applied at 1.25 gal/sq [0.51 L/m ²] (11.25 mils wet)
Existing Roof:	Granulated Modified Bitumen Roof Cover System (APP & SBS)
Wind:	Meets the wind uplift rating of the existing roof to a maximum Class 1-360
ASTM E 108:	Class A @ 0.25 in 12
Hail	SH

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.

PROJECT DATA RECORD: PR449631

ORIGINAL TEST DATA: None