




2023 Fall Subscribers' Meeting
Naples, Florida – October 23-24, 2023

Roofing Industry Technical Issues



Mark S. Graham
Vice President, Technical Services
National Roofing Contractors Association
Rosemont, Illinois

1

Fastener concerns

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ACE SCREWS

ADD ACE FASTENERS TO YOUR FM NAV NUMBERS & YOUR SUPPLY CHAIN

***The following are FM Approved Products: Ace #15, Ace #12, 2-3/8" Barbed Seam Plate, 3" WW Insulation Plate, 3" BE Insulation Plate**

MANUFACTURERS
We are working with manufacturers to include Ace Fasteners in their FM NAV numbers

DISTRIBUTORS
Add our FM approved fasteners to your Generics, or simply let us private label** for you!

****Private Labeling with FM Logo must go through the proper FM PLA Process**

**GREAT PRICES
GREAT SERVICE**

CALL ACE & LET'S WORK TOGETHER!

ACESCREWS.COM | ACE SCREWS | @ACESCREWS | @ACESCREWS | 855-707-4700

*The following are FM Approved Products: Ace #15, Ace #12, 2-3/8" Barbed Seam Plate, 3" WW Insulation Plate, 3" BE Insulation Plate. **Private Labeling with FM Logo must go through the proper FM PLA Process.

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RoofNav

Help · Support · Training | mgraham · My Profile · Reset Password · Logout

Enter Assembly #

MY PROJECTS | PRODUCT SEARCH | SYSTEM SEARCH | ASSEMBLY SEARCH | RATINGS CALCULATOR | REFERENCE MATERIALS

Search Criteria | Search Results

Found: 7 records

Trade Name ↑	Company Name	Approved Use
2-3/8" Barbed Seam Plates	Ace Screws LLC	Fastening (Stress Plate)
3" WW Insulation Plates	Ace Screws LLC	Fastening (Stress Plate)
3" BE Insulation Plates	Ace Screws LLC	Fastening (Stress Plate)
ACE #12	Ace Screws LLC	Fastening (Fastener)
ACE #15	Ace Screws LLC	Fastening (Fastener)
ACE-FS12-INS	Ace Screws LLC	Fastening (Fastener)
ACE-FS15-INB	Ace Screws LLC	Fastening (Fastener)

1 - 7 of 7 items

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Some considerations

Fastener concerns

- Purchase membrane and insulation fasteners supplied by the roof system manufacturer
- Listen for feedback from field applicators
- Contact NRCA Technical Services with questions or concerns

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“Frankenstein roofs”

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FM Approvals' RoofNav
www.RoofNav.com

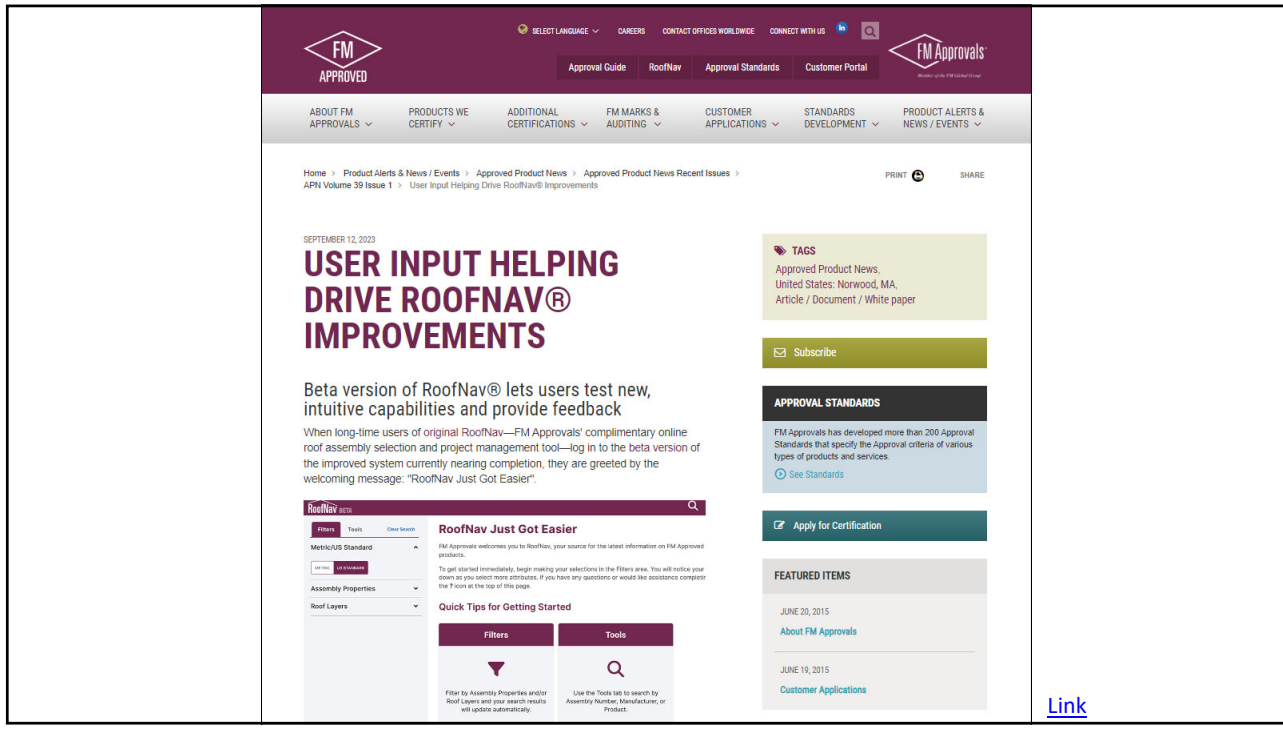
There are 1,205,035 approved roof assembly configurations in FM Approvals' RoofNav

--As of October 22, 2023

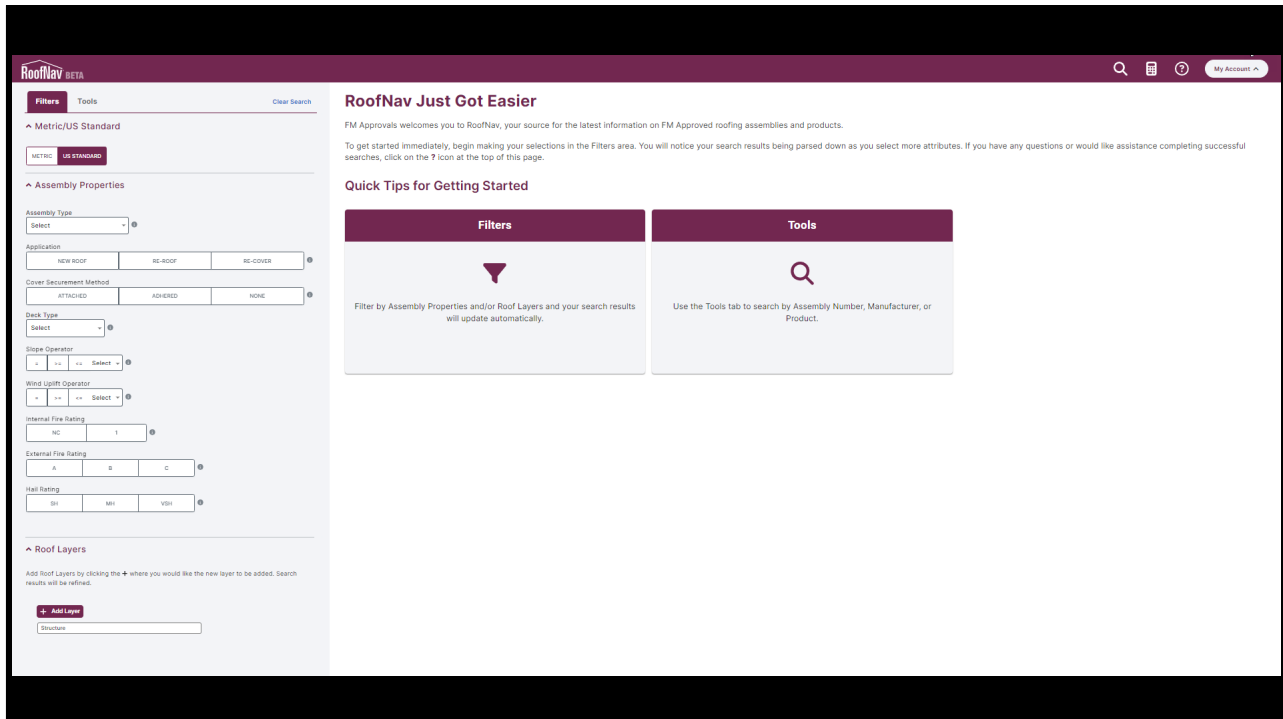
7

FM Approvals' RoofNav -- New Beta test version

8



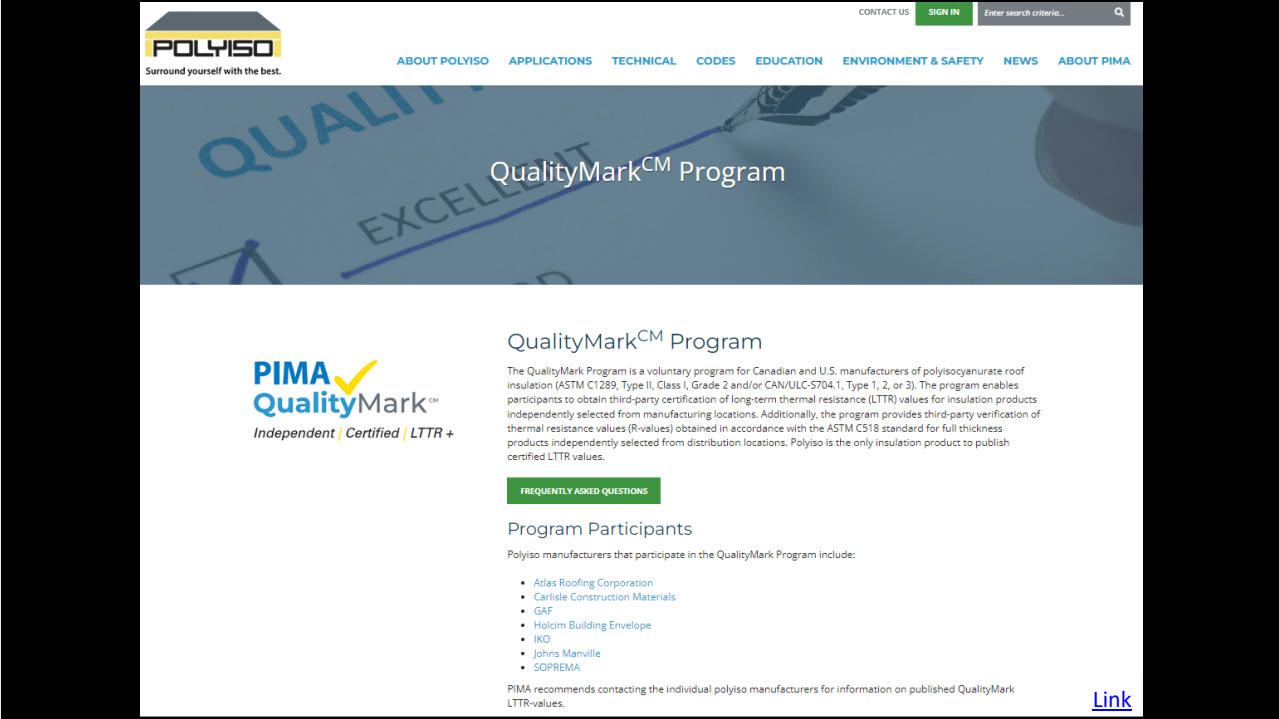
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QualityMark™ Program Quarterly Conformance Report
Reporting Period: Q1 2023 (January – March 2023)
Last updated on October 2, 2023

About:
The QualityMark Program is a voluntary program for manufacturers of polyisocyanurate roof insulation in the United States and Canada. The program enables participants to obtain third-party certification of long-term thermal resistance (LTTR) values for insulation products independently selected from manufacturing locations. Additionally, the program provides third-party verification of thermal resistance values (R-values) tested in accordance with the ASTM C518 standard for full thickness products independently selected from



LTTR-value Certification for Products Selected from Manufacturing Locations:
Samples for LTTR-value certification are selected from manufacturing locations by independent third parties. The testing is performed by approved laboratories to obtain LTTR-values for 2.0”, 3.0”, and 4.0” product. Participating manufacturers are required to obtain an initial certification for each manufacturing location, which are then recertified every 3 years. The certification is used to validate the LTTR-values published by participating manufacturers.

R-value Verification for Products Selected from Distribution:
Samples for R-value verification (ASTM C518) are selected on a quarterly basis from distribution locations by an independent third party. A sample is selected for each participating manufacturing location. After selection, the samples are held at laboratory conditions and tested at full thickness 180-days after the date of manufacture. A manufacturing location is deemed to conform to the program requirements when the measured R-value at 180-days is equal to or greater than the published LTTR-value for the product at the same labeled thickness. Manufacturing locations that receive non-conforming R-value verification results in consecutive quarters (inclusive of the current reporting period) are not in compliance with the program requirements.

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QualityMark Program Quarterly Conformance Report ¹ Reporting Period: Q1 2023 (January – March 2023)		
Manufacturing Location		Manufacturer
City	State/Province	
High River*	Alberta	IKO Industries Ltd.
Phoenix	Arizona	Atlas Roofing Corporation
Vancouver	British Columbia	Atlas Roofing Corporation
Northglenn	Colorado	Atlas Roofing Corporation
Bristol	Connecticut	Holcim Building Envelope
Jacksonville	Florida	Holcim Building Envelope
Jacksonville	Florida	Johns Manville
Lake City	Florida	Carlisle Construction Materials
LaGrange	Georgia	Atlas Roofing Corporation
Statesboro	Georgia	GAF
Florence	Kentucky	Holcim Building Envelope
East Moline	Illinois	Atlas Roofing Corporation
Franklin Park	Illinois	Carlisle Construction Materials
Bremen	Indiana	Johns Manville
Fernley	Nevada	Johns Manville
Montgomery	New York	Carlisle Construction Materials
Cornwall	Ontario	Johns Manville
Toronto	Ontario	Atlas Roofing Corporation
Camp Hill	Pennsylvania	Atlas Roofing Corporation
Hazleton	Pennsylvania	Johns Manville
New Columbia	Pennsylvania	GAF
Smithfield	Pennsylvania	Carlisle Construction Materials
Youngwood	Pennsylvania	Holcim Building Envelope
Drummondville	Quebec	SOPREMA
Corsicana	Texas	Holcim Building Envelope
Diboll	Texas	Atlas Roofing Corporation
Gainesville	Texas	GAF
Terrell	Texas	Carlisle Construction Materials
Cedar City	Utah	GAF
Salt Lake City	Utah	Holcim Building Envelope
Tooele	Utah	Carlisle Construction Materials
Puyallup	Washington	Carlisle Construction Materials
DeForest	Wisconsin	Holcim Building Envelope

Last updated on October 2, 2023. Current report available at www.polyiso.org/QUALITYMARK.

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Table Note 1:

The manufacturing locations listed below have recently been brought on-line. The time represented by the current reporting period was prior to the date the location either started commercial production or completed its initial LTTR-value certification. Results for these plants will be included in future reporting periods.

- Hagerstown, Maryland – IKO Industries Ltd.
- Hillsboro, Texas – Johns Manville
- Sikeston, Missouri – Carlisle Construction Materials

Questions:
For questions regarding the QualityMark Program, please contact PIMA using the "Contact Us" form on the website [here](#).

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Recommendations

- Watch for updates to PIMA's Quarterly Conformance Report
- Consider asking polyiso. manufacturers to certify their current compliance
- Be careful to represent/sell insulation on its thickness, not by its R-value

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RESEARCH+TECH



Updating PIMA's QualityMark™

Revisions provide increased credibility
by Mark S. Graham

The Polyisocyanurate Insulation Manufacturers Association recently updated its QualityMark program, which has been in existence since 2004 and addresses the long-term thermal resistances of polyisocyanurate insulation used in low-slope roof systems.

What it is
 PIMA's QualityMark is a voluntary program for manufacturers of rigid board polyisocyanurate roof insulation manufactured in the U.S. and Canada. The program allows manufacturers to obtain and use third-party verification of long-term thermal resistance values, commonly referred to as LTTR, for their products. Additionally, the program provides third-party verification of R-values.

The following polyisocyanurate insulation manufacturers participate in the program:

- Atlas Roofing Corp., Meridian, Miss.
- Carlisle Construction Materials, Carlisle, Pa.
- GAF, Parsippany-Troy Hills, N.J.
- Holcim Building Envelope, Nashville, Tenn.

28 professionalroofing.net JULY/AUGUST 2023

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July/August 2023

Link

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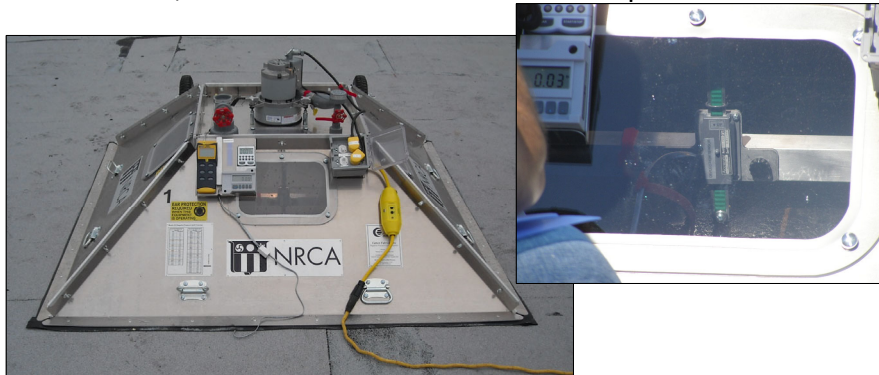
Field wind-uplift testing

Putting the field wind-uplift test to the test

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Field wind-uplift testing

- ASTM E907, “Standard Test Method for Field Testing Uplift Resistance for Adhered membrane Roofing Systems”
- FM 1-52, “Field Verification of Roof Wind Uplift Resistance”



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INDUSTRY ISSUE UPDATE

NRCA Member Benefit


Field-uplift testing

ASTM E907 and FM 1-52 tests continue to be problematic

June 2015

NRCA continues to receive a significant number of reports from roofing contractors, manufacturers and designers regarding the use of and problems associated with field-uplift tests as pre-installation quality assurance measures for membrane roofing systems. NRCA has addressed these testing issues a number of times during the year. Following is a summary of NRCA's previous discussions, as well as updated information and recommendations.

ASTM E907/FM 1-52
There are two recognized field test methods for determining adhered membrane roof system uplift resistance: ASTM E907, "Standard Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems," and FM Global Loss Prevention Data Sheet 1-52 (FM 1-52), "Field Verification of Roof Wind Uplift Resistance."



Both test methods are similar and provide for affixing a 5-by-5-foot dome-like chamber to a roof surface's upwind and applying a defined negative (uplift) pressure inside the chamber to the roof system's exterior side surface using a vacuum pump (see photos). During the test, membrane surface deflection inside the chamber is visually monitored and measured to determine whether a roof system passes or is "suspect."

Using ASTM E907, a roof system is considered to be suspect if the deflection measured during the test is 25 mm (about 1 inch) or greater. During FM 1-52 testing, a roof system is suspect if the measured deflection is between 1/8 of an inch and 3/8 of an inch depending

on the maximum test pressure: 1 inch where a thin topping board (cover board) is used, or 2 inches where a thin cover board or flexible, mechanically attached insulation is used.

If an ASTM E907 or FM 1-52 test yields a suspect result, a test cut should be taken in the test area to determine whether failure has occurred and the specific failure mode.

ASTM E907 and FM 1-52 differ notably in their test cycles and maximum test pressures for determining roof system deflections and whether a roof system passes or is suspect. ASTM E907 testing is conducted in 15-second per square foot (psf) pressure intervals up to the calculated design wind (uplift) pressure for the specific roof system being evaluated. FM 1-52 testing is conducted using an initial 15-psf psf pressure followed by 7.5-psf psf increments up to a maximum test pressure of 1.25 times the design uplift pressure for the specific roof system being evaluated.

Considering maximum test loading and allowable test deflections in combination, FM 1-52 requires 25 percent higher test loads, yet only allows as little as 1/8 the test deflection of ASTM E907. This adds FM 1-52 is a significantly more stringent test than ASTM E907. ASTM E907 originally was published as a recognized consensus standard in 1983, and it was revised in 1996. In 2013, ASTM withdrew ASTM E907 because a consensus could not be reached regarding necessary revisions—most significantly, defining the test method's precision and bias (accuracy). ASTM E907-06 still is available for use and can be obtained directly from ASTM's website, www.astm.org.

FM 1-52 is an FM Global proprietary evaluation method and not a recognized industry consensus test standard. FM 1-52's scope indicates it only is intended to confirm acceptable wind-uplift resistance on completed roof systems in hurricane-prone regions, where a general blow-off has occurred or where inferior roof system construction is suspected or known to be present.

FM 1-52 originally was published by FM Global in October 1978. The negative-pressure uplift test was added in August 1980 and has been revised several times. The current edition is dated July 2012 and includes an option for "visual construction observation (VCO)" as an alternative to negative-pressure uplift testing. VCO provides for full-time, third-party monitoring of a roof system application to verify roof system installation in accordance with contract documents.

NRCA “Industry Issue Update,” June 2015

NRCA members’ experience:

- Most tests not conducted in accordance with ASTM E907 or FM 1-52.
- No correlation between field test vs. lab. results/classifications
- NRCA survey: 55% passing


[Link](#)

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RESEARCH+TECH



Revisiting field uplift testing
NRCA's long-standing concerns continue with this issue
by Mark S. Graham

It has been a while since I have written about NRCA's concerns with field uplift testing, which sometimes is inappropriately used as a way to assess the quality of an adhered membrane roof system installation. Despite the time that has passed, NRCA continues to have reservations about field uplift testing, and the test procedure has not yet been revised to address NRCA's concerns.

ASTM E907

In 2013, ASTM International withdrew its consensus-based test method for field uplift testing, ASTM E907: "Standard Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems." ASTM International requires its test method standards to include a precision statement addressing two things:

- Known within-laboratory variability, referred to as "repeatability"
- Relative variability of test results obtained from different laboratories, referred to as "reproducibility"

Test methods also are required to include an estimate of bias in test results.

24 professionalroofing.net DECEMBER/JANUARY 2022-23

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December/January 2022-23

[Link](#)

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ASTM Interlaboratory study (ILS)

"Testing the test"

- Built three identical test decks allowing for 24 tests total
- FM Class 90 roof system (FM tested to 90 psf)
- 8 testing entities conducted 3 test each
- Each test run at 15 psf increments up to 90 psf classification
- Membrane deflection is measured
- ASTM ILS staff planned the study and analyzed the test results
- At FM Global's research center in Glocester, RI

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ILS results

“Testing the test”

- Statistical outliers 15-, 30-, 45-, 60- and 90-psf test increments
- Outlier data excluded at 30-, 45- and 90-psf test increments
- 16 of the 24 specimens exhibited failure before completing the 90-psf test increment.
- 5 results at the 45-psf increment and all the tests’ results at 60, 75- and 90-psf test increments exceeded FM 1-52’s maximum allowable deflection.

All specimens should have exceeded 90 psf

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RESEARCH+ TECH



Putting the test to the test
Substantial variability has been found in field-uplift testing
by Mark S. Graham

NRCAs participated in an ASTM International interlaboratory study to evaluate the accuracy and precision of the field-uplift test method. The study provides some useful data and information for evaluating the appropriateness and effectiveness of field-uplift testing.

Field-uplift testing
There are two recognized field test methods for determining adhered membrane roof systems’ uplift resistance: ASTM E997, “Standard Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems,” and FM Global Loss Prevention Data Sheet 1-52 (FM 1-52), “Field Verification of Roof Wind Uplift Resistance.” In each of these test methods, a vacuum is created inside a test chamber mounted on a roof surface and membrane deflections resulting from the induced negative (uplift) pressures inside the chamber are measured.

ASTM E997 has been a consensus-based standard since it was originally published in 1985. ASTM International withdrew the standard in 2023 because it lacked a precision statement, which is required for all ASTM International test methods.

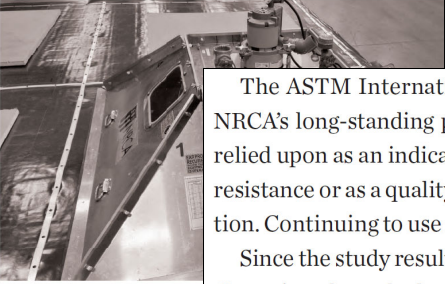
22 professionalroofing.net SEPTEMBER 2023

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September 2023

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RESEARCH+TECH



Putting the test to the test
Substantial variability has been found in field-uplift testing
by Mark S. Graham

22 professionalroofing.net SEPTEMBER 2023

The ASTM International interlaboratory study clearly illustrates NRCA's long-standing position that field-uplift testing should not be relied upon as an indicator of an adhered roof assembly's in situ uplift resistance or as a quality-assurance measure of roof assembly installation. Continuing to use it as such is irresponsible.

Since the study results were released, NRCA's Technical Operations Committee has asked FM Global to immediately discontinue use of FM 1-52's field-uplift test as a quality-assurance measure for roof assembly installation. 🌱🌿🍃

Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems, and FM Global Loss Prevention Data Sheet 1-52 (P 1-52), "Field Verification of Roof Wind Uplift Resistance." In each of these test methods, a vacuum is created inside a test chamber mounted on a roof surface and membrane deflection resulting from the induced negative (uplift) pressure inside the chamber are measured.
ASTM E907 has been a consensus-based standard since it was originally published in 1995. ASTM International withdrew the standard in 2013 because it lacked a precision statement, which is required for all ASTM International test methods.

[Link](#)

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Nighttime tie-in and night seal considerations



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XXI. WATER CUTOFFS AND WEATHER PROTECTION

Water cutoffs are temporary felt courses that are installed to prevent moisture from entering the insulation and membrane during construction. They should be applied at the end of each day's work and whenever work is halted for an indefinite period to protect the membrane from precipitation. They must be removed prior to installing additional insulation.

Temporary flashings should be installed as weather protection if permanent flashings are not in place. All openings in the membrane should be sealed to prevent any moisture from entering the roof system before completing membrane application.

Specifications requiring gravel installation each day are unrealistic and sometimes detrimental to the quality of the completed roof. Where working conditions permit, roofing felts should be "glazed" and sealed at the end of each day's work if final surfacing is not installed.

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With single-ply membrane systems, nighttime tie-ins and night seals have gotten more difficult...

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Some considerations

Nighttime tie-ins and night seals

- Project specific planning...
- Get back to the basics...
 - Water cut-off
 - Night seals
- SA underlayment and base sheet products can work well for cut-offs

Concepts to share?

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Roof deck loading considerations

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Some examples of roof loading

- Pallet of asphalt shingles (42 bundles): 2,500 to 4,200 lbs.
- Pallet of TPO membrane rolls: 1,400 to 3,450 lbs.
- Pallet of MB cap sheet (20 rolls): About 2,500 lbs.
- Pallet of glass-faced gypsum board (4 x 4): 1,600 to 2,400 lbs.
- Pallet of bonding adhesive (45 pails): 1,800 lbs.
- Bundle of polyiso. (4 x 8): 250 to 500 lbs.

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University of Massachusetts – Amherst

Draft report: “Roof Live Loads for Low-Slope Roofs”

Joint research

Metal Building Manufacturers Association

National Roofing Contractors Association

Steel Deck Institute

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Some initial considerations

Roof deck loading concerns

- Roofing operations may exceed live load capacity
- Note joist/framing orientation
- Consider avoiding adjacent load placement
- Position loads across joists/framing
- Consider added dunnage across framing
- Also consider rooftop equipment weight

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The screenshot shows a web page for 'Low Slope Roofing Systems' under the 'Interdisciplinary Professional Programs' of the 'College of Engineering'. The page includes a navigation menu with options like 'Professional Development Courses', 'Certificates', and 'Online Master's Degrees'. The main content area features a 'Course Overview' section with a description of the course, a 'Who Should Attend?' list including contractors, architects, and materials specifiers, and an 'Upcoming dates (1)' section for 'Nov. 28-29, 2023' in 'Madison, WI'. A red 'ENROLL NOW' button and an 'Add to Calendar' link are visible. A 'Link' text is present at the bottom right of the screenshot.

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Other topics and your questions

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