


**LEGALCON LIVE 2023:
EMBRACE THE POWER OF 3**

**OCT. 11-13
Chicago**
nrca.net/legalconference

**Emerging technical issues posing liability risks
to roofing contractors**



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

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**Nailbase insulation
considerations**

2

Nailbase insulation considerations

- Double layer design and application
- Taped joints can control vapor leaks/underlayment wrinkling at board joints
- Pressure-tested and FRT nailbase are not good ideas for nailbase

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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**

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*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

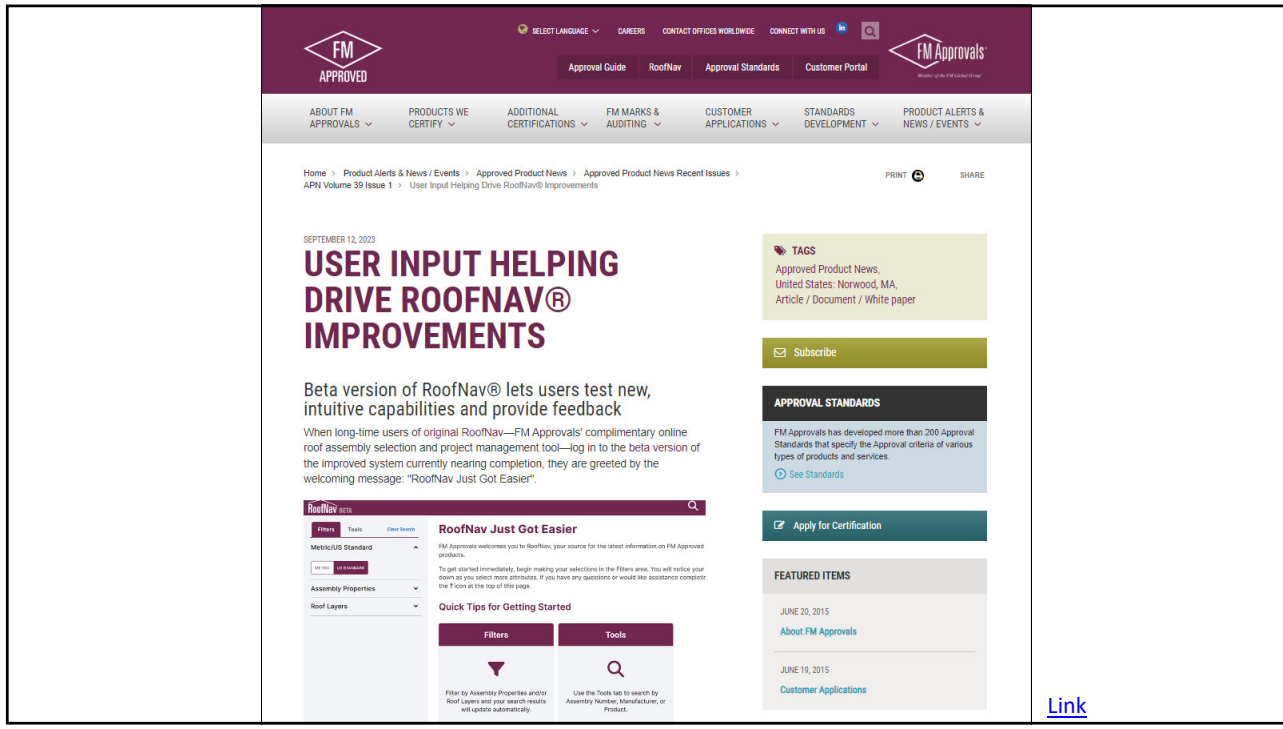
There are 1,182,731 approved roof assembly configurations in FM Approvals' RoofNav

--As of October 12, 2023

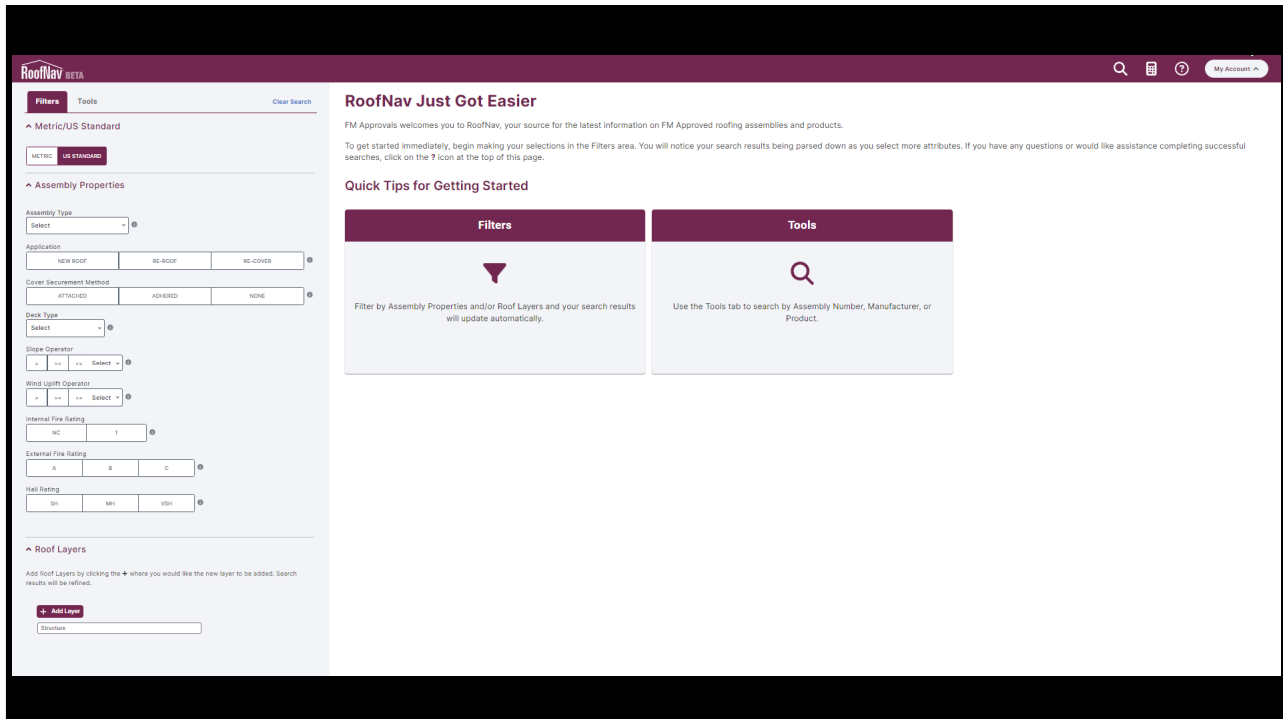
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FM Approvals' RoofNav -- New Beta test version

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Radio frequency radiation
Rooftop cell phone transmitters

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CRCA
Construction Roofing Contractors Association

Advisory Bulletin

APRIL 2023



Radiofrequency Radiation and Electromagnetic Fields

The increased number of cellular antennas and other communication equipment that generates radiofrequency radiation (RF) and electromagnetic fields (EMF) may be exposing roofers and other contractors to harmful levels of radiations when working on rooftops, sides of buildings and other locations where RF generating antennas are located. This bulletin will focus on radiation types, safety limits and mitigating exposure.

With the ever-increasing use and development of communication technology, there is an increased risk for those working in and around communication devices and equipment that emit radiofrequency electromagnetic fields (EMF) such as smart meters, cell phone towers and equipment using 5G technology. Roof areas are often prime locations for this type of equipment and anyone accessing these roof areas for any reason should be aware of the Occupational Health and Safety requirements and the Safety Code 6. Consult with provincial and/or federal authorities having jurisdiction for further information/guidance for most stringent requirements.

What is Radiofrequency (RF) Radiation?
There are two types of radiation – ionizing radiation and non-ionizing radiation. Both are forms of electromagnetic energy, but ionizing radiation has more energy than non-ionizing radiation. Ionizing radiation, like x-rays or gamma rays, has enough energy to cause chemical changes by breaking chemical bonds. Sources of this type of radiation can be found in hospitals, nuclear energy plants, and nuclear weapons facilities. Non-ionizing radiation causes molecules to vibrate, which generates heat. RF radiation is a type of non-ionizing radiation and is the energy used to transmit wireless information. RF radiation is invisible and power levels of equipment and amount of RF radiation can fluctuate without warning.

About Safety Code 6
Health Canada publishes Safety Code 6¹ which sets out recommended safety limits for human exposure to radiofrequency electromagnetic fields (EMF) in the frequency range from 3 kHz to 300 GHz. This range covers the frequencies used by communications devices and equipment that emit radiofrequency EMF such as: Wi-Fi, cell phones, smart meters, cell phone towers, those using 5G technology.

Safety Code 6 is reviewed on a regular basis to confirm that it continues to provide protection against all known potentially adverse health effects. If new scientific evidence were to show that exposure to radiofrequency EMF below the levels found in Safety Code 6 poses a risk, the Government of Canada would take steps to protect the health of Canadians.

<https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/occupational-exposure-regulations/safety-code-6-radiofrequency-exposure-guidelines.html>


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CRCA Advisory Bulletin

June 2023

[Link](#)

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How protect yourself from RF radiation

The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

How protect yourself from RF radiation

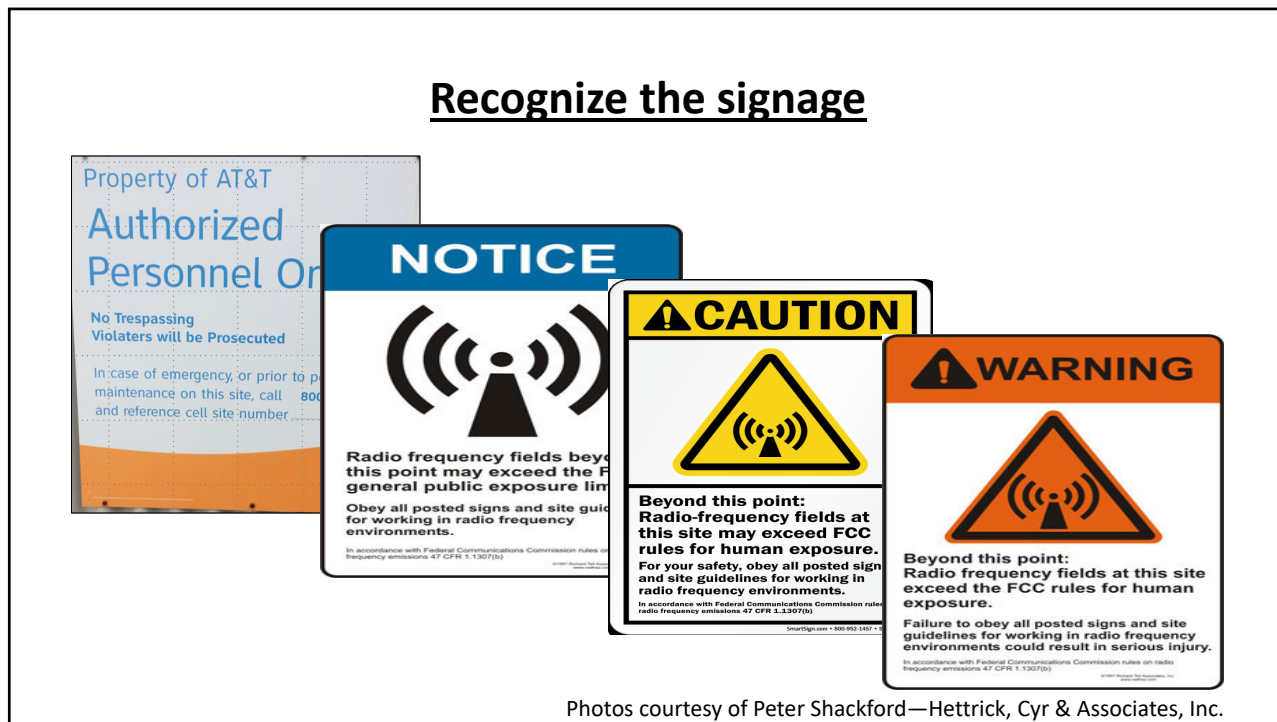
The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

- Complete a visual assessment of the area to determine if cellular antennas or other RF radiation generating antennas are present. If you are not sure, ask your supervisor, the building owner, or the property manager if RF-generating antennas are present where you need to work. The building owner or property manager should have the information, or know whom to contact for information about antennas, their locations, and the RF radiation levels.
- Look for warning signs posted near RF antennas; the signs should identify the hazard and tell you where to get more information.
- Contact the building owner/manager and the antenna licensee to have the equipment temporarily powered down or moved.


The opinions expressed herein are those of the CRCA National Technical Committee. This Advisory Bulletin is circulated for the purpose of bringing roofing information to the attention of the reader. The data, commentary, opinions and conclusions, if any, are not intended to provide the reader with consultative technical advice and the reader should not act only on the roofing information contained in this Advisory Bulletin without seeking specific professional, engineering or architectural advice. Neither the CRCA nor any of its officers, directors, members or employees assumes any responsibility for any of the roofing information contained herein or the consequences of any interpretation which the reader may take from such information.

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- Look for warning signs posted near RF antennas; the signs should identify the hazard and tell you where to get more information.
- Contact the building owner/manager and the antenna licensee to have the equipment temporarily powered down or moved.

If work needs to be performed within a potentially hazardous area:

- Check the site survey or roof plan for potential exposure levels
- Pre-plan work tasks and travel routes so you can limit trips through the RF field and time spent on tasks there – the goal is to get in and out as quickly as possible.
- Avoid standing directly in front of or close to an antenna. As a rule of thumb, stay 1.5 m (6 feet) away from a single antenna and 3 m (10 feet) away from a group of antennas.
- Use a personal RF monitor. The monitor will warn you if you are in an area where RF radiation is at a dangerous level. There are several handheld EMF personal safety monitors available on the market that measure exposure and allow workers to work in an exposed area for a limited time. Use personal monitors and protective clothing while work is being performed and if an alarm sounds, stop work and leave the area immediately.

the reader may take from such information.

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Some useful references

- CRCA Advisory Bulletin ([Link](#))
- Health Canada's Safety Code 6 ([Link](#))
- Federal Communications Commission ([Link](#))
- Center for Construction Research and Training ([Link](#))

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PIMA QualityMark^{CM} program

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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

23

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 LTRR-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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Professional Roofing
July/August 2023

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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 roof systems. NRCA has addressed these testing issues a number of times during the years. Following is a summary of NRCA 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 and applying a defined negative (uplift) pressure inside the chamber to the roof system's membrane side surface using a vacuum pump (see photo). 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 (solar 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 rerun 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-pound 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 pressure followed by 7.5-psf pressure 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 per only allows as little as 1/8 the test deflection of ASTM E907. Thus, 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 2003, ASTM withdrew ASTM E907 because a consensus could not be reached regarding necessary revisions—most significantly, defining the test methods' precision and bias (accuracy). ASTM E907, as well as 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 partial 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 1970. 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

Professional Roofing

December/January 2022-23

I t 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 2003, 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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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

22 professionalroofing.net SEPTEMBER 2023

NRCA 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 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." 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 (suction) pressures inside the chamber are measured.

ASTM E907 has been a consensus-based standard since it was originally published in 1983. ASTM International withdrew the standard in 2013 because it lacked a precision statement, which is required for all ASTM International test methods.


Professional Roofing

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 (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 (suction) pressures inside the chamber are measured.

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[Link](#)

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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 website for 'Interdisciplinary Professional Programs' at the 'College of Engineering'. The navigation bar includes 'Professional Development Courses', 'Certificates', 'Online Master's Degrees', 'Custom Courses', 'UWECB', 'ORM', and 'About'. The main content area is for the 'Low Slope Roofing Systems' course, which includes a 'Course Overview', 'Who Should Attend?' list, and an 'Upcoming dates (1)' section with a date of 'Nov. 28-29, 2023' in 'Madison, WI' and an 'ENROLL NOW' button. A 'Link' is present at the bottom right of the screenshot.

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The advertisement features the logo for the 'INTERNATIONAL ROOFING EXPO' on the left, which is a stylized roof shape in black, grey, and red, with the text 'INTERNATIONAL ROOFING EXPO' and 'Sponsored by NRCA' below it. To the right, the text reads 'FEBRUARY 6-8, 2024 | LAS VEGAS, NV' and 'LAS VEGAS CONVENTION CENTER'. Below this, it states 'THE PREMIER ROOFING & EXTERIORS EVENT' and provides the website 'www.TheRoofingExpo.com' in blue text.

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Other topics and your questions

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