

# Putting Roof Fasteners to the Test

Mike Ennis, RRC, Technical Director, Single Ply Roofing Industry

The importance of following low-slope roof fastening requirements is of particular importance in the State of Florida, with Dade and Broward Counties classified as High Velocity Hurricane Zones. With roof systems required to resist winds of 150 mph or more, it's equally critical that roofing professionals ensure that accurate roof fastener pullout tests are conducted.

Since 1996, the roofing industry has relied on an American National Standard Institute (ANSI) approved document that provides procedures used in the field to test the pullout resistance of all types of roof fasteners and substrate combinations. ANSI/SPRI FX-1 Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners was the first of 12 current American National Standards published by SPRI, the association representing sheet membrane and component suppliers to the commercial roofing industry.



With roof systems required to resist winds of 150 mph or more in Dade and Broward counties, it is critical that roofing professionals ensure that accurate roof fastener pullout tests are conducted. (Photos courtesy of OMG Inc.)

ANSI requires that its standards are re-canvassed every five years. For this reason, on June 29, 2016, SPRI successfully revised and approved FX-1 for the third time since its initial approval by ANSI 20 years ago.

ANSI/SPRI FX-1 has become a widely accepted industry standard or common protocol for determining, in the field, whether a particular roof deck substrate and fastener combination will provide sufficient holding force by effectively measuring the amount of force that is required to remove the roof fastener from the substrate. By following the procedures listed in FX-1, roof system manufacturers, design professionals, and other practitioners can be confident that the pullout resistance values for the specific fastener installed into the load-resisting material of the deck will be accurate to +/- 5 percent.

The initial approval and three reapprovals by ANSI required aggressive canvassing, diligent committee work and adhering to ANSI Essential Requirements within the document itself. However, the most important thing to recognize about FX-1, or any ANSI/SPRI approved document, is that it is a true consensus standard.

"(FX-1) has been reviewed and input offered and often incorporated from a broad spectrum of users and interested parties," says Chris Mader, chair of SPRI's FX-1 task force. "Factory Mutual, roof consultants, structural engineers, roofing contractors, fastener manufacturers and roof membrane manufacturers are all a part of the process. In addition, FM references FX-1 in its Data Sheet 1-29."

FX-1 requires that the pullout test be performed by an individual trained by the manufacturer of the fasteners being tested for the proper installation of the fastener and the use of the installation tools and equipment. In addition, a representative of the building owner should be present to witness the test and verify the values. Of course, the roofing contractor or other roofing professional should also be on-site to immediately repair the roof in areas where the tests were performed.

## WSRCA Introduces New Testing Protocol

In the summer of 2015, the Western States Roofing Contractors Association (WSRCA) introduced a fastener withdrawal resistance (FWR) test protocol to association members as part of its Technical Bulletin No. 2015-L-1. The bulletin stressed the need for an industry protocol for testing FWR.



Mike Ennis, SPRI



WSRCA's Low-Slope Roofing Committee offered background on the traditional use of fasteners to secure wood plank and wood panel sheathing to underlying roof framing to construct "nailable" roof decks. However, the document points out that various screw-fasteners have been commonly used to attach a variety of insulations, coverboards, single-ply roof membranes and other roofing materials to form multi-layer roof systems.

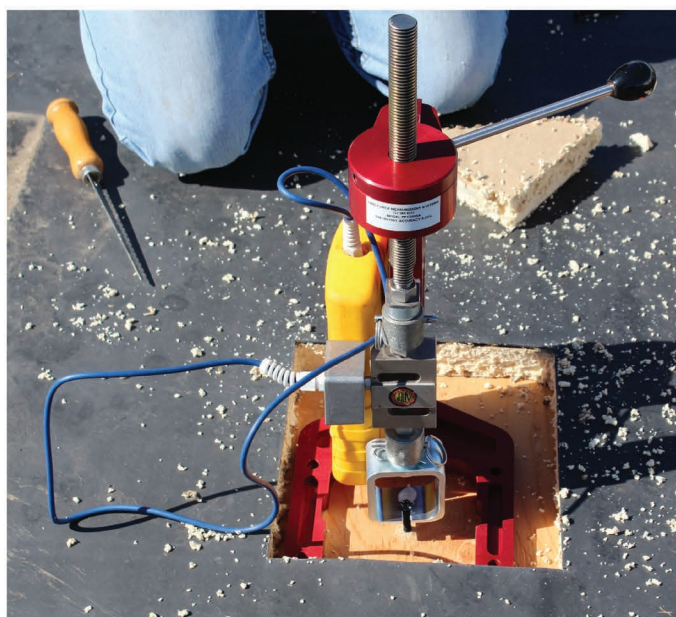
The bulletin maintains that, "Currently there is not a widely accepted industry standard or common protocol for determining, in the field, whether a particular roof deck substrate and fastener combination will provide sufficient holding force to secure the intended roof system or system components so as to achieve wind-uplift resistance to meet the requirements of Code, the roofing material manufacturer, and given Project requirements."

However, the roofing industry has found that ANSI/SPRI FX-1 has met the standard requirements WSRCA's bulletin insists are lacking.

It is true that the gathering of owner's representatives and roofing professionals required by FX-1 for pullout testing can be inconvenient and sometimes downright difficult for the roofing contractor to coordinate. That may be one reason why WSRCA's Low-Slope Roofing Committee is looking to develop a protocol that would allow contractors to conduct their own pullout tests and submit them as "evidence" to roof system manufacturers.

Unfortunately, based on input from membrane manufacturers, SPRI has found that most – if not all – system suppliers will currently not accept a test conducted by the roofing contractor alone for warranted work.

The WSRCA committee's efforts toward a new protocol for fastener withdrawal resistance testing would require that a significantly greater number of fastener



Setting up for a pullout test. The DMD Force Measurement Systems Model PFT2000A is designed to give accurate results within 0.25%.

# The Preferred Choice of Roof Vacuuming



*Serving the Southeast  
for over 30 Years!*

Dedicated to the Roofing Industry with  
a full line of Roof Vacuuming Services:

- ◆ Ballast Removal
- ◆ One Pass Dry Vacuum
- ◆ Wet Vacuum

FREE QUOTE  
Call or email  
today

800-762-8361

We strive to provide the most reliable roof preparation in the business. RK's experience, technology, and timeliness permit us to handle numerous projects at a time and we are available 364 days a year. RK is setting the standard in roof vacuuming services.



stevea@rkhydrovacnc.com

rons@rkhydrovacnc.com

roberth@rkhydrovacnc.com

**www.RKHydroVac.com**





tests be done on the roof. Compared to FX-1's requirements, the pullout team would be required to do a lot more work and documentation, especially as roof areas get larger. This also means more cores in the roofing system that will need to be repaired.

"This suggested protocol is admittedly more detailed," says Mader. "In my view, this is 'above and beyond' what is essentially required by an existing consensus standard (FX-1) that has already been used successfully by roofing professionals for more than 20 years."

One of the big advantages of ANSI/SPRI FX-1 is the document's inclusion of a detailed "Pullout Test Report" for submittals. Form "A" of the test report features job data, fastener manufacturer, deck types, as well as optional information. Form "B" is used to report up to 40 test results and units of measure, including the reasons and authorization for any deviations from standard FX-1 procedures. A roof plan is also required to identify where the pullouts were performed with the corresponding test numbers to match.

*ANSI/SPRI FX-1 has become a widely accepted industry standard or common protocol for determining, in the field, whether a particular roof deck substrate and fastener combination will provide sufficient holding force by effectively measuring the amount of force that is required to remove the roof fastener from the substrate.*

## Thanks to You, Storm Bond Just Had Its Biggest Year Ever.

Roofs offer protection from the brunt of storms, and during Florida storm season they can use all the help they can get. Storm Bond Roofing Adhesive has earned multiple approvals as one of the best deterrents out there. Storm Bond is:

- High velocity hurricane zone tested and approved
- Economical and fast curing
- Specifically designed to adhere clay and concrete roof tiles

Learn more at [touch-n-seal.com/roofing](http://touch-n-seal.com/roofing)  
or by calling us at 800-325-6180

**Touch  
'n Seal**

**Storm Bond**  
ROOF TILE ADHESIVE



N.O.A. 16-0412.03

Florida Building Code Approval FL 14506



— Member



Although it may still be a work-in-progress, the trade association's 14-page document does not feature a clear and concise test report for submittals.

"Fundamentally, both protocols are similar," says Mader. "The trade association's document requires a lot more pulls and 'clumps' three tests into one 'zone' and averages them. Ultimately, you will end up with similar results on most roofs."

Both documents recommend seeking out areas that seem susceptible to issues and testing them as safely as possible, which is perhaps the most important part of any roof evaluation," Mader continues.

It is important to remember that there is nothing stopping a user of ANSI/SPRI FX-1 to add more pull-out tests, take images or include other details. FX-1 is a baseline minimum standard, and roofing professionals can require additional information on pullout performance if deemed necessary. In fact, in its Commentary, FX-1 outlines scenarios where additional work may be needed.

There is no question that WSRCA's committee has put a significant amount of time, thought and effort into its proposed protocol. However, there have been no updates to the document since the summer of 2015.

The greatest challenge facing the new protocol is also its most glaring weakness: It is not a consensus standard and lacks a 20-year history of acceptance

within the roofing industry. As for ANSI, the institute will not accept competing standards. Because ANSI/SPRI FX-1 is directly or indirectly associated with a variety of industry codes and recommendations, a roofing contractor who follows the new document's requirements may very well put his company at risk.

"ANSI/SPRI FX-1 has been one of our longest running standards and continues to be a useful tool for contractors and manufacturers alike," says Mader. "We're proud to continue our tradition of providing the industry with up-to-date and useful standards to make roofing systems better."

**FRM**

For more information about SPRI and its activities, or to download ANSI/SPRI FX-1, visit SPRI's Web site at [www.spri.org](http://www.spri.org) or contact the association at [info@spri.org](mailto:info@spri.org).

Mike Ennis, RRC, joined the Single-ply Roofing Industry (SPRI) trade association in 1993. He has chaired various SPRI committees and task forces, and served as president from 2004 to 2006. He became the group's technical director in 2007. Ennis can be reached at [info@spri.org](mailto:info@spri.org).

## USP UNDERLAYMENT SPECIALTIES PLUS



## RoofTopGuard II™ Premium Engineered for Performance & Safety

RoofTopGuard II is unlike other synthetic underlayments. It was carefully engineered to be the safest, best-performing underlayment in the world, making it the premium brand underlayment available on the market today.

### It outperforms everything on the Market

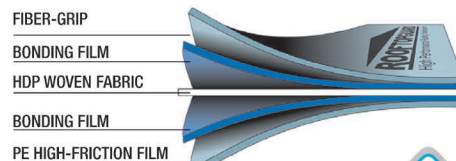
Trusted by roofing professionals worldwide for over 35 years, RoofTopGuard II Premium Fiber Grip construction gives you superior traction in challenging weather and freeze/thaw conditions and on high-pitched roofs. Its 5-layer density and substantial feel provide unparalleled handling and unrivaled tack, inspiring confidence.



Engineered with a non-woven topside you can actually walk on it, safely and securely, in wet environments.



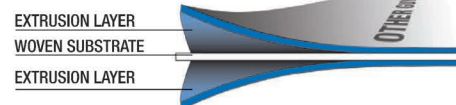
### RoofTopGuard II™ Premium 5-LAYER CONSTRUCTION



The deckside is a high friction film that provides tack which stabilizes the product during installation.



### OTHER Synthetic Underlayment 3-LAYER CONSTRUCTION



# SAFER, STRONGER, SIMPLY SUPERIOR.

The **NUMBER ONE CHOICE** of contractors who place a premium on **safety** and **performance**

**ROOFTOPGUARD II™**  
High Performance Roofing Underlayment

#### Underlayment Specialties Plus

HEAD OFFICE: 1529 Gehman Road, Suite B, Harleysville, PA 19438 • OHIO LOCATION: 20 Park Rd, Painesville, Ohio 44077  
Toll Free: 844.767.4963 • Tel: 267.263.2308 • [sal@uspunderlayment.com](mailto:sal@uspunderlayment.com) • [www.uspunderlayment.com](http://www.uspunderlayment.com)

**rkw**  
Manufacturer:  
Rosenlew RKW Finland Ltd.