



FM Approvals offers steep-slope guidance

Did you know comprehensive testing is available for shingles and tile?

by Mark S. Graham

Roofing professionals look to and rely on FM Approvals for guidance, testing and certification approvals for fire- and wind-resistances of low-slope membrane roof systems. However, some are not aware of or overlook FM Approvals' similar testing and certification approvals of steep-slope roof systems.

FM 4475

FM 4475, "Steep Slope Roof Covers," provides testing and certification requirements for shingles or tiles. The standard defines steep-slope roofing as a roof with a slope of 2:12 or greater. Testing includes criteria for evaluating resistances to wind, exterior and interior fires, and impact (simulated hail).

Simulated wind-resistance testing is conducted using ASTM D3161, "Standard Test Method for Wind Resistance of Steep Slope Roofing Products (Fan-Induced Method)." A minimum of two test panels are required to resist a minimum wind speed of 110 mph. Then, test speed velocities can be

increased in 10-mph increments, each for a duration of 10 minutes, up to 150 mph. FM 4475’s test capacity is higher than the maximum 110 mph prescribed in ASTM D3161.

For new construction applications, FM 4475 also requires testing according to ANSI/FM 4474, “Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.” This is the same test method FM Approvals uses for its approvals of low-slope membrane roof systems. The minimum tested resistance for approval of steep-slope roof coverings is Class 60. Test pressures can be increased by 15-pounds-per-square-foot increments to achieve higher classifications.

Simulated exterior fire spread testing is conducted using ASTM E108, “Standard Test Methods for Fire Tests of Roof Coverings.” This test includes spread of flame, intermittent flame spread and burning brand tests and results in Class A, B or C ratings. Two spread of flame, two intermittent flame spread and four burning brand tests are required. However, for noncombustible steep-slope roof decks, the intermittent flame spread and burning brand tests are not required.

Simulated interior (below the roof deck) fire spread testing is conducted using NFPA 276, “Standard Method of Fire Test for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components.” Maximum fuel contribution rate measured in the test should not exceed 410 Btu/ft²/minute at three minutes, 390 Btu/ft²/minute at five minutes, 360 Btu/ft²/minute at 10 minutes and 285 Btu/ft²/minute at 30 minutes.

Simulated hail testing is conducted using ANSI/FM 4473, “American National Standard for Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls.” ANSI/FM 4473’s Classes 2, 3 and 4 or VSH (very severe hail) classification apply. Nominal ice ball sizes and kinetic energies for each of these classifications are shown in the figure.

For FM 4475, ANSI/FM 4473’s Class 2 is the minimum requirement. Classes 3 and 4 are available as higher resistances. A minimum of two successful tests are required to qualify for a given classification.

Testing for the VSH classification is conducted using ANSI/FM 4473 with 2-inch-diameter ice balls and artificially weathering test specimens before testing. A minimum of three successful tests are required for the VSH classification.

FM 4475 also has specific labeling, a quality-assurance program and surveillance audit requirements. The purpose of the quality-assurance program and surveillance audit requirements are to ensure manufacturers’ equipment, procedures and product designs are consistent with what was tested and certified.

Using FM 4475


The advantage of using FM 4475 versus other single-attribute test methods is it addresses multiple attribute resistances for approval.

Steep-slope roof systems complying with FM 4475 are listed in FM Approval’s RoofNav application (roofnav.com). Currently, only four shingle roof systems from three manufacturers comply with FM 4475. The wind and impact resistances of each differ.

Class	Nominal ice ball diameter	Kinetic energy
2	1½ inches	7.77 ft·lb
3	1¾ inches	14.95 ft·lb
4	2 inches	26.81 ft·lb
VSH	2 inches	53 ft·lb

ANSI/FM 4473’s classifications used in FM 4475

I expect roof system manufacturers will continue to add steep-slope roof systems to the FM 4475 listing in RoofNav.

Some steep-slope roof system manufacturers have tested their products using the ANSI/FM 4473 impact resistance test method and promote their products’ impact resistances based on that testing. In most instances, these products have been tested at test laboratories other than FM Approvals. This should not be confused with or interpreted as complying with FM Approvals’ FM 4475 approval classification. 

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Is your company cyber resilient?

When it comes to cybersecurity, companies often focus solely on preventing potential cyberattacks. However, it is impossible to be completely protected from every threat.

In *Harvard Business Review*, Keri Pearlson, executive director of the research consortium Cybersecurity at MIT Sloan, Cambridge, Mass., says it is crucial companies move from a prevention mindset to a resilience mindset. Although focusing on prevention means doing all you can to keep cybercriminals out, focusing on resilience adds an additional layer as you work with the expectation that a cyberattack still can happen and invest in preparing to respond and recover when it does.

Pearlson shares the following things leaders of cyber resilient companies do differently.

- **They build a culture of cyber-security.** These leaders have ensured everyone in the company—no matter their positions—play a role in helping the company be secure and resilient. They build values, attitudes and beliefs about the importance of keeping the company resilient rather than simply relying on technology-based barriers.

To view the Association of Certified Fraud Examiners' report, "Occupational Fraud 2024: A Report to the Nations," go to professionalroofing.net.

- **They prepare responses to a cyberattack—and practice.** These companies conduct exercises and drills so everyone knows what to do if an incident occurs. Leaders can stress-test processes, structures and technology so they respond more quickly. Pearlson says the most common way to test

business recover plans and incident response plans is to design an exercise that simulates a cyberattack and then employ the response plan. You even could include third parties, such as suppliers, customers or consultants.

- **They are "secure by design."** The concept of secure by design typically refers to the practice of thinking about security of a digital system or application at the earliest stages of the design process; however, leaders can apply the practice to their entire companies. Leaders can look for ways to design their organizations, processes and technology with consideration for security and resilience from the beginning.
- **They have the right communications processes in place.** When considering crisis communications, it is important to have a backup plan. For example, a company's crisis communications plan may involve communicating via email, but if a breach occurs, email communication may be compromised and unavailable. Delays caused by an unclear or ineffective communications plan can harm the recovery process. It is important to have a crisis communications plan in place that considers various types of communication.

To help contractors address cyber liability risk, NRCA has partnered with BPM Insurance Services and Acrisure to create NRCA's Cyber Liability Insurance Program, available at nrca.net/cyberpolicy.



SPRI to canvass TDP-1 test standard

SPRI has announced it is partnering with FM Approvals to create a new standard, "Test Standard for Comparative Adhesion Strengths of Waterproofing Membranes, Membrane Adhesives and Board Stock Materials or Other Suitable Substrates Used with Low-Slope Roofing Systems."

The proposed standard will be canvassed for approval as an American National Standard and is based on FM Approvals' existing small-scale test procedure for membrane adhesive and board stock or other suitable substrate evaluation. The test procedure is used to determine the maximum failure load of waterproofing membranes and board stock materials or other suitable substrates when secured with a membrane adhesive and exposed to a linear load perpendicular to the plane in which the waterproofing membrane is installed on the board stock material or other suitable substrate.

For more information, visit spri.org.

Generative AI can help prevent fraud

The construction industry is plagued by fraud and ranks in the top five median losses by industry, according to a report by the Association of Certified Fraud Examiners. The report also indicates the median loss for the construction industry is \$250,000 and the median duration of a fraudulent scheme is 12 months.

Construction Executive shares the following benefits of using generative artificial intelligence to detect and prevent fraud.

Improve fraud detection and prevention accuracy and efficiency. Generative AI can generate realistic and diverse fraud-detection and -prevention scenarios based on inputs such as contracts, invoices, project specifications, receipts and reports. This can help identify and quantify potential fraud risks and indicators, as well as their patterns and anomalies. Generative AI can generate solutions such as fraud-prevention strategies, fraud-detection thresholds and fraud-response actions. This can help reduce the likelihood and effect of fraud, as well as the time and cost of fraud detection and prevention.

Enhance fraud-detection and prevention learning and innovation. Generative AI can generate novel and unexpected outputs, such as new fraud schemes, fraud-detection methods and fraud-prevention

measures based on existing data. This can help expand the construction industry's fraud-detection and -prevention knowledge base and facilitate the discovery of new opportunities.

Increase fraud-detection and prevention communication and collaboration.

Generative AI can generate visualizations

and narratives based on fraud data and insights. This can help stakeholders, such as project owners, contractors, suppliers, regulators and insurers, communicate and share fraud information and knowledge to facilitate better decision making and coordination.

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