



# CHIEF ENGINEER

Official Publication of The Chief Engineers Association of Chicago and  
SINCE 1934

October 2018

## TEMPORARY STRUCTURE SHOOTOUT: VRF VS. ELECTRIC RESISTANCE



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**Advanced Anti-Corrosion Coating Utilized on Two  
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**Portable Friction Testing Can Prevent Slip-and-Fall  
Accidents and Deter Costly Liability**



*Innovative portable friction testers enable quick, high volume, lab-quality SCOF testing by virtually anyone on a variety of surfaces.*

## Portable Friction Testing Can Prevent Slip-and-Fall Accidents and Deter Costly Liability

For facility managers of malls, grocery stores and other large commercial buildings, ensuring safety and preventing slip-and-fall litigation can come down to documenting that their walkway surfaces meet safe standards in terms of available traction, particularly when wet — when falls are more likely.

When slip-and-fall liability can top 5 or 6 figures per incident due to negligence, medical expenses, lost wages/future earnings, pain and suffering, and other factors, simply cleaning up spills on flooring is no longer an adequate response.

Instead, a proactive plan is required that prevents clutter; speeds cleanup, and routinely documents safe flooring traction. Today, this often entails measuring the Static Coefficient of Friction (SCOF) on a range of materials to meet the ANSNFSI B101.1-2009 Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials.

In this regard, SCOF  $\geq$  0.60 equates with high traction (lower probability of slipping);  $0.40 \leq$  SCOF  $<$  0.60 equates with moderate traction (increased probability of slipping); and SCOF  $<$

0.40 equates with minimal available traction (higher probability of slipping).

Since most slip-and-fall lawsuits allege that the property owner failed to provide a reasonably safe walkway, periodic documentation of safe SCOF measurements can help to assure safety, deter lawsuits, and minimize liability.

While transportable manual strain gauges that are pulled by hand have traditionally been used for such measurement, these do not provide a truly reliable means of high-volume testing on varying surfaces in multiple locations as needed. The devices are also complicated to use, requiring calibration and specialized training.

Fortunately, a new generation of innovative, portable, friction testers are now enabling fast, lab-quality SCOF testing in volume by essentially anyone without specialized training. With this capability, onsite measurement is easily conducted on a variety of surfaces, even at an angle or upside down. Even stairs, ramps and inclines can now be readily measured.

This can help to facilitate safety on a host of flooring materials, while documenting compliance and preventing slip-and-fall liability.

#### Traditional Testing Limitations

For onsite measurement of existing flooring, manual strain gauges are traditionally used to test the SCOF by facility managers of large commercial establishments. However, the problem with these bulky transportable units, pulled by an operator over horizontal test surfaces, is that the devices introduce human error.

"With a manual strain gauge, the operator is trying to measure very minute numbers, but cannot pull the unit with a steadily increasing force until it starts to break free, and then stop exactly at that point to get an accurate number," says John Bogart, Managing Director of Kett USA, a manufacturer of a full range of SCOF and surface property analyzers for various industries.

Additionally, these units do not fit in narrow spaces such as stairs, and do not accurately measure areas that are not level, such as ramps. The units also do not distinguish between individual spots in a larger area, but only give the average without variation — which can leave some areas out of compliance.

Another challenge with manual strain gauges is that the

devices do not readily measure mixed surfaces. This can be a problem not only with water, wax, polish, etc., residing on the surface of the flooring material, but also with certain shoe sole surfaces, such as leather or high heels, which can significantly change the SCOF and make slip-and-fall incidents more likely.

Finally, using such instruments can require substantial training. Even then, any variance in measuring technique between technicians can cause further differences in accuracy.

#### Portable Testing Benefits

In contrast to complex, traditional transportable units that can be larger than a microwave oven, easier-to-use, portable friction analyzers about the size of a hand mixer are now available. These can essentially be used anywhere onsite at locations with installed flooring. As such, utilizing them can help to ensure safe, compliant SCOF documentation that deters slip-and-fall litigation and liability.

Examples of this include two handheld, battery-operated models, the H94i and H37i by Kett. Both are designed so that virtually anyone can quickly use them with minimal training, wherever SCOF measurement is needed. Operation is simple. The operator puts the unit on the surface to be tested, presses the measure key, and obtains the SCOF value in seconds, with accuracy comparable to lab models.

The units rely on an electric coil assembly and a magnet to create an easily variable and precisely measurable force. When the operator presses the measure key, a voice coil motor increases the force exerted on a fixed slider until it begins to move. An integrated microprocessor measures the force vectors and calculates the SCOF.

To enhance accuracy, both units automatically calculate averages to reduce operator judgment on mixed surfaces. Even with these capabilities, both instruments are compact enough to take measurements in smaller spaces — such as stair steps — so the operator can also determine SCOF variations.

(Continued on page 12)

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Onsite measurements is easily conducted on a variety of surfaces, even at an angle or upside down with these new analyzers.

While the H94i must be used on a level surface, the newer H37i has integrated angle adjustments that allow it to be used at any angle from horizontal to vertical to upside down. This enables onsite SCOF measurement on ramps and inclines as well.

The newer model, in fact, has been used to measure the SCOF of a variety of materials at slopes as high as 45° in a recent unpublished National Institute for Occupational Safety and Health (NIOSH) study.

Compared to less flexible traditional methods, another benefit of the portable friction testers is the devices' allowance for more versatile testing with a variety of mixed surfaces. This can include any solid or liquid on both hard and soft surfaces.

According to Bogart, the ability to attach an interface layer onto the portable units enables multilayer simulation tests. These, for instance, can simulate the slip resistance of various shoe surfaces (leather, high heel, rubber) on flooring materials, both dry and wet.

#### Ensuring Safety, Deterring Liability

The bottom line for facility management professionals is that

they can now truly protect customers and themselves from dangerous, costly slip-and-fall incidents. With portable SCOF testing, they can ensure and document that all of their walking surface materials are within safe specifications anywhere as needed.

For more info, contact Kett: call 800-438-5388; email [support@kett.com](mailto:support@kett.com); or visit [www.kett.com](http://www.kett.com).

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# Tax Reform Provides Fire Sprinkler Incentive for Businesses

This past December, Congress passed sweeping tax reforms (P.L. 115-97) that include a pair of provisions that incentivize the installation of fire sprinkler systems in businesses. If you own a business and have been thinking about putting in or updating your sprinkler system, now is a great time in which to do so. Here are the provisions that may help you:

## Cost Recover Section 13201

In the past, sprinkler systems installed in commercial buildings depreciated over a 39-year time line. (Residential sprinkler systems depreciated over a 27.5-year timeline.) With the passage of the new legislation, any sprinkler system installed after Sept. 27th, 2017, and until Dec. 31st, 2022, may be fully expensed. The property owner can immediately write off the full cost of the sprinkler system. After 2022, the ability to deduct the cost will be as follows:

2023	80%
2024	60%
2025	40%
2026	20%

2027 The depreciation schedule reverts back to the 39-year time line for commercial buildings and 27.5 years for residential structures.

## Small Business Section 179 Expensing

Prior to this recently passed legislation, small businesses were allowed to fully expense hardware purchases like computers, equipment and light-duty vehicles up to \$500,000/year. The new tax law enables businesses to claim fire protection as an eligible expenditure under Section 179 of the tax code, with an increased cap to \$1 million/year. This provision applies only to commercial structures, not for retrofitting sprinklers into residential properties. But properties where sprinkler systems are critical, such as entertainment venues, are easily within the bounds of this provision. Unlike the above Section 13201, this change in the law is permanent and not phased out over time.

The National Fire Sprinkler Association (NFSA) has created a few examples to help people to more fully understand the tax law and how it might affect you as a business or property owner.

### Example 1: Nightclub Retrofit

7,500 square-foot assembly occupancy  
Cost of sprinkler installation: \$6.00/sq. ft.  
Total: \$45,000

### Example 2: Bowling Alley

20,000 square-foot assembly occupancy  
Cost of sprinkler installation: \$4.50/sq. ft.  
Total: \$90,000

In both the above examples, assuming they are small busi-

nesses, under 179, the cost of the sprinkler system installation can be fully expensed. This is a permanent law not subject to being phased out. Under the previous law, your system would have depreciated over a 39-year period.

### Example 3: High-Rise Office

18-story high-rise with 26,000 sq. ft./floor (468,000 total sq. ft.)  
Cost of sprinkler installation: \$6.50/sq. ft.  
Total: \$3,042,000

In this case, you would be able to fully expense for the first five years. After five years, you can recover the costs in the following manner:

Year 6:	80%
Year 7:	60%
Year 8:	40%
Year 9:	20%
Year 10:	0%

Any percentage not fully expensed after this time would then be amortized over a 39-year period. Previously, you would have recouped expenses over 39 years.

### Example 4: You own 16 Group Homes as a Health Care Provider

You choose to upgrade all of your fire alarms and fire sprinkler systems.  
Total: \$5,000,000

As in Example 3, you can fully expense for five years. For 16 group homes you may not be qualified for depreciation through 179. Check with your tax advisor for clarification.

If you have a question about a building type you're not seeing here, or have additional questions or concerns, the NFSA encourages you to reach out to its Director of Outreach & Government Relations Vickie Pritchett at (443) 569-9506 or via email at [pritchett@nfsa.org](mailto:pritchett@nfsa.org).

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