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# Portable Friction Tests Can Prevent Slip & Fall Accidents, Deter Liability

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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 five or six 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 clean up, 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 ANSI/NFSI 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

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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 such as ramps which are not level. 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 which can be larger than a microwave oven, easy 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 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 measureable 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.

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 degrees 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 multi-layer 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.

*John Bogart is the Managing Director of [Kett USA](#), located in Orange CA.*

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