

# Risk Control Bulletin: Tribometry – A Scientific Approach to Reducing Slip-and-Fall Hazards



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RISK CONTROL



Whether you measure slips and falls by disabilities, lost working days or accidental deaths, they are rising. Each year, over 8 million people are sent to hospital emergency rooms as the result of slip-and-fall accidents ([www.cdc.gov](http://www.cdc.gov)). In the United States, accidental deaths resulting from slip-and-fall incidents more than doubled between 1992 and 2012 (Injury Facts 2015 Edition-NSC). Real Estate, Retail, Healthcare and Professional Services business segments experience frequent slip/fall injuries as suggested by CNA claims data.

CNA measures hard surface walkways, under prevailing conditions, using tribometry. Tribometry is the measurement of friction on a surface, as carried out with a tribometer.

CNA has launched several initiatives utilizing tribometry to reduce the frequency and severity of slips and falls:

- Collaborative Claims/Risk Control study that looks at effective methods of reducing disability impacts.
- Risk assessment of hard surface walkways.
- Education about walkway safety.

Although all people walk in their own unique way, research has shown that our walking patterns are similar. All people need approximately the same amount of traction, or slip resistance, to keep them upright while walking. Adequate traction at the shoe/floor interface is critical to slip resistance, which is a function of the friction provided when a shoe moves along a walkway. This concept is called the Dynamic Coefficient of Friction (DCOF).

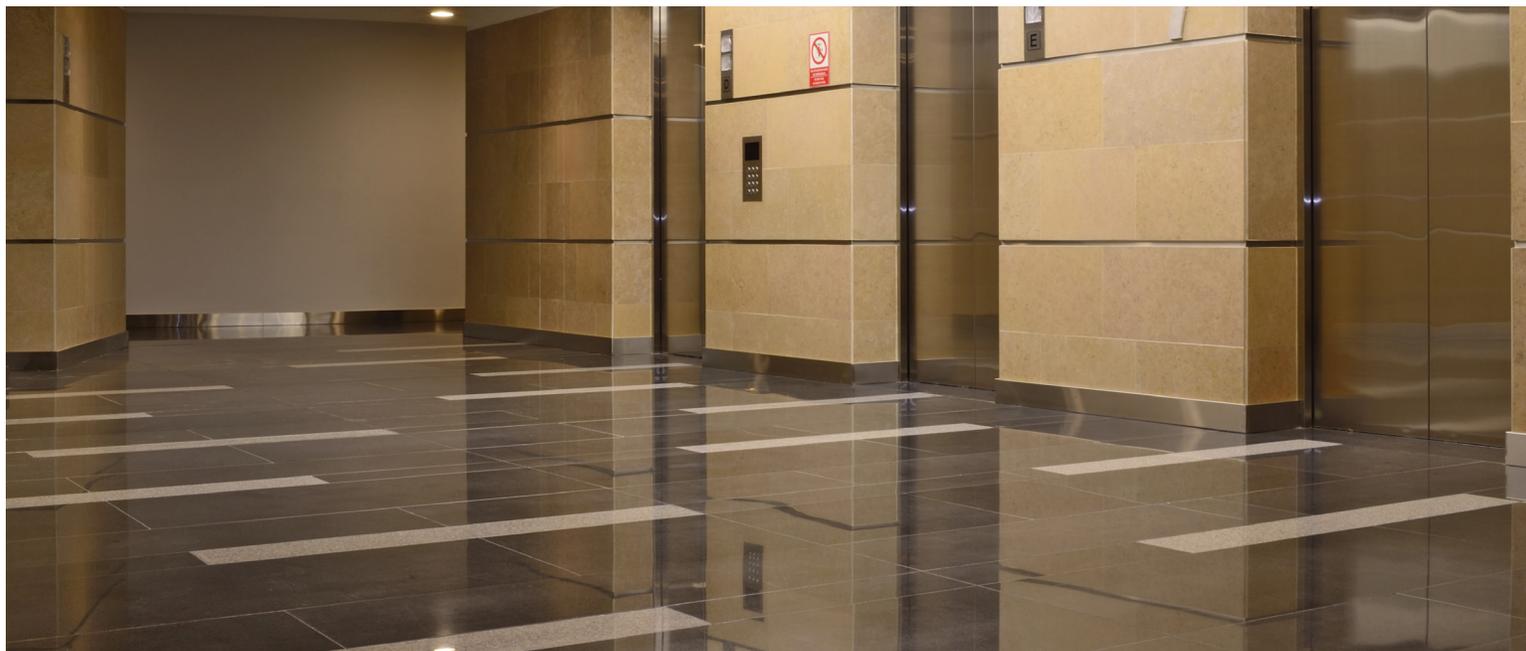
DCOF is the force required to keep one object moving over the surface of another object. If there is adequate DCOF between the shoe sole and the floor, there will be adequate resistance to a slip becoming a slide and, ultimately, a fall.

The target DCOF level and the methodology to measure it have been incorporated into two American National Standards\* (ANSI), one established for flooring manufacturers and one for real world testing. Both use a target threshold of DCOF 0.42 and both prescribe the use of a specific type of tribometer to take the measurement.

While there are a handful of tribometers that are compatible with the DCOF standards, CNA utilizes the BOT-3000E device, manufactured by Regan Scientific Instruments ([www.regansci.com](http://www.regansci.com)) to assist insureds with measuring flooring slip resistance. This user-friendly device employs modern digital electronic technology to measure, record and transfer DCOF data into a format that graphically and physically documents actual readings. The test report can be printed on the spot or transferred digitally to a printer.



The BOT 3000E has a number of menu selections on the device, programmed to the two ANSI formats (ANSI/NFSI B 101.3 2012 or ANSI A 137.1). Our CNA Risk Control specialists are qualified in both the use of this device and the evaluation of the results and appropriate corrective actions if a slip hazard is detected.



Wet DCOF Value ( $\mu$ D)	Slip Resistance Potential	Action
>0.45 (inclines) >0.42 (level)	High - Lower probability of slipping	Monitor DCOF regularly and maintain cleanliness.
0.30 – 0.45 (inclines)	Acceptable - Increased probability of slipping	Monitor DCOF regularly and maintain cleanliness. Consider traction-enhancing products and practices where applicable for intended use.
<0.30	Low - Higher probability of slipping	Seek professional intervention. Consider replacing flooring and/or coating with high-traction products.

Source: ANSI/NFSI B101.3-2012

As walkway auditors, CNA Risk Control consultants are qualified to offer opinions on the conformance of pedestrian hard surface walkways to relevant safety standards. The walkway auditor works with the insured to review pertinent loss trends and recent slip/fall accidents. With the test sites selected, the walkway auditor performs a slip resistance test with the BOT 3000E. After the test sites are selected, the consultant will perform a slip resistance test with the tribometer.

Contaminants, floor surface cleaning, wear and after treatments (coatings/sealants) can all impact the friction of a walking surface. Tribometry of your hard surface walkways will determine slip resistance, so strategies can be implemented to make DCOF improvements.

To learn more about how CNA's Risk Control services can help you manage your risks and increase efficiencies, please contact CNA Risk Control at 866-262-0540, or visit [www.cna.com/riskcontrol](http://www.cna.com/riskcontrol).

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