



Real Estate Industry

# InControl



## SLIPS, TRIPS & FALLS

# New Techniques to Control Slips and Falls in Public Places



In a study by the Institute of Real Estate Management, 57 percent of respondents ranked slips and falls as the single leading cause of current disputes, and 63 percent ranked such accidents among the top three management issues they and their colleagues face.

Slips and falls in public places are far and away the leading cause of premises liability injuries. Premises liability is the legal responsibility of a property owner or manager of real property for injuries caused to others or their property due to conditions or activities on the real property.<sup>1</sup>

According to data from the All Injury Program, a cooperative program involving the National Center for Injury Prevention and Control, the Centers for Disease Control and Prevention (CDC) and the Consumer Product Safety Commission, over eight million people were treated for slip- and fall-related injuries in 2008. Excluding the 15 to 24 age group, slips and falls were the leading cause of nonfatal injuries.<sup>1,2</sup>

Statistically, seniors are far more likely to experience a slip-and-fall accident. According to the American Academy of Orthopedic Surgeons, these types of injuries are also the leading cause of hospitalization for older adults.<sup>3</sup> With the aging baby boomer generation, the size and scope of this issue is expected to grow significantly. The National Floor Safety Institute (NFSI) estimates that between 2005 and 2020, the number of seniors in the U.S. will increase from 35 million to 77 million.<sup>4</sup> The CDC estimates that by the year 2020, the annual direct and indirect cost of fall injuries is expected to reach \$54.9 billion (in 2007 dollars).<sup>5</sup>

CNA's loss results mirror these statistics. Slip-and-fall injuries continue to be the leading source of General Liability claims incurred by our policyholders in the real estate sector.

The following is an analysis of exposures based on claims incurred by real estate companies insured by CNA between January 1, 2007, and December 31, 2009.\*

## GENERAL LIABILITY CLAIMS

### Top Five Incidents Causing the Injury, Shown as a Percentage of Total Claims

Incident Type	Percent of Total Claims
Slip/Trip-Fall On Level	53.0%
Damage Not Otherwise Classified	9.0%
Struck By	7.0%
Fall From	7.0%
Leaking/Seeping	4.0%

### Top Five Incident Types as a Percentage of Total Claim Dollars

Incident Type	Percent Of Total Incurred Losses
Slip/Trip-Fall On Level	61.0%
Fall From	8.0%
Struck By	7.0%
Assault/Battery	5.0%
Leaking/Seeping	3.0%

\* Data Source: Merlin 1/2010

## SLIP AND FALL PREVENTION — THE CLASSIC APPROACH

For real estate operations, a slip-, trip- or fall-related injury — even a minor one — can result in hefty payouts to injured parties, lost profitability and increased liability insurance premiums. Our analysis reveals these types of incidents are the most common and expensive for property owners and managers of public buildings.

The causes of these incidents are well understood and include:

- Lack of slip resistance on walking surfaces
- Improper floor maintenance procedures
- Poor walking surface conditions
- Poor visibility
- Lack or poor condition of handrails and guardrails
- Poor stairway design
- Improper walkway transitions
- Distractions, such as displays and advertisements
- Poor housekeeping, such as cluttered walkways and poor material storage

Traditionally, risk control professionals have encouraged building owners to adopt various types of slip, trip and fall prevention programs centering on the first five factors identified in this brochure. Such plans call for periodic inspection of public areas for hazards and their prompt correction. Good floor maintenance is encouraged as is the use of walk-off matting to prevent contaminants from migrating into public walkways. Prompt detection and isolation of spills is encouraged in such plans as is the isolation and prompt cleanup of the spill itself.

While these control measures continue to be important, the most important control element — walkway slip resistance — has been difficult to measure and quantify. Compounding the issue is that the slip resistance of flooring can change if the floor surface is not properly maintained by maintenance personnel.

The American National Standards Institute's (ANSI), A1264.2-2001 *Standard for the Provision of Slip Resistance on Walking/Working Surfaces*, suggests a static coefficient of friction (SCOF) of > 0.50 for walking surfaces under dry conditions.

In October 2009, ANSI, in conjunction with the National Floor Safety Institute (NFSI), issued NFSI/ANSI B101.1-2009 *Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials*. Based on years of clinical studies, the NFSI found that floors whose wet SCOF was that of a 0.60 value or greater reduced slip-and-fall claims by as much as 90 percent. This standard defines a "High Traction" walkway as having a measured SCOF of > 0.60 for wet walking surfaces.

Simply put, High-Traction floors present the least amount of slip-and-fall risk while Low-Traction floors present the highest risk for a slip and fall. This testing process, using both laboratory devices and field testing tribometers, has been researched and developed in various European countries, most notably Germany, over the last three decades.

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At CNA, we believe that the objective measurement of wet SCOF using the NFSI/ANSI B101.1-2009 Standard provides a valuable missing piece to the slip-and-fall puzzle. This information not only establishes the slip resistance of newly installed walking surfaces, but also determines whether floor maintenance procedures contribute to slip resistance deterioration and subsequent injuries.

After evaluating several instruments to measure wet SCOF, we chose the Binary Output Tribometer (BOT) 3000 manufactured by Regan Scientific Instruments, Inc. out of Southlake, Texas. This instrument meets our needs. It can measure both dry and wet SCOF, is easily calibrated and is robust enough for field transport. The device obtains accurate, repeatable readings, independent of user skill.

"...with the recent publication of the ANSI/NFSI B101.1 standard in 2009, the U.S. now has its first unified floor safety standard that defines the slip risks associated with hard-surface floors."

Russ Kendzior,  
author of "Falls Aren't Funny" and founder of the National Floor Safety Institute<sup>7</sup>





## WHAT FACTORS INFLUENCE SLIP RESISTANCE?

Any factor that changes the level of friction between two surfaces affects slip resistance. When the floor surface and the sole of an individual's shoe are clean and dry, there is generally a high level of friction between the surfaces. In this case, the likelihood of slips and falls is reduced. Over time, as flooring surfaces and shoe soles become covered by foreign materials such as dirt, grease and water, the level of friction is reduced. This increases the likelihood of a slip and fall.

Some cleaning products used on flooring surfaces can build up a film in the pores of flooring material. This reduces the friction produced by the surface, increasing the likelihood of slips and falls. Such a buildup of materials is called polymerization. The longer polymerization continues, the more difficult it is to remove. The effects of polymerization are increased when the surface becomes wet, in places such as restaurants, building lobbies and other public indoor areas.

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“Property management clients are positioning themselves to defend slip-and-fall claims by implementing a floor safety walkway program, including coefficient of friction testing. However, just knowing what the floor surfaces are in terms of slip resistance standards is one thing. Taking preventative action that can be used to document an improvement to the surface with a treatment or improved cleaning techniques is the real answer to solve the slip-and-fall crisis facing so many organizations.”

Ken Fisher, **Chief Operating Officer,**  
**Nu-Safe Floor Solutions, Inc.**

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“While the casual observer might think that most falls are attributable to footwear or the type of material a floor is made from, it's actually how and by whom a floor is cleaned that causes slips and falls. From the start, we knew we needed to carefully look at the cleaning and floor maintenance procedures and products.”

Dave Ludwin, **CNA's General Liability Risk Control Director**

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## CASE STUDY

To determine the applicability of walkway slip-resistance testing on hazard control, CNA Risk Control sought to identify a partner with significant public spaces willing to participate in a study. In March 2005, CNA partnered with a client to study the slip resistance in four of its public-use properties.

“While the casual observer might think that most falls are attributable to footwear or the type of material a floor is made from, it's actually how and by whom a floor is cleaned that causes slips and falls,” notes Dave Ludwin, CNA's General Liability Risk Control Director. “From the start, we knew we needed to carefully look at the cleaning and floor maintenance procedures and products.”

CNA Risk Control's evaluation of each property's operation focused on two data sets. Slip resistance samples were obtained 1) after the facility closed for the evening, and 2) after the cleaning crew had completed its work but before the facility opened for business the next day. This back-to-back approach ensured accurate readings because there wasn't any traffic from one measurement period to the next.

Once the areas to be studied were selected, we applied the sampling program specified in an earlier version of the 2009 NFSI/ANSI B101.1-2009 *Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials*.

More than 650 measurements of the four sites' flooring surfaces were compiled during the four-month study period. The results showed that slip resistance improved after a floor was properly cleaned and actually got worse if proper cleaning procedures were not followed. The study supported the practice of establishing and adhering to a regular floor care maintenance program. An additional finding of the study was the value of regularly replacing floor mats in heavy traffic areas.

## WHAT CNA LEARNED

The results highlighted the importance of establishing and adhering to a regular floor care maintenance program since the study showed consistent improvement in flooring slip resistance following proper cleaning.

The actual degree of improvement was in large part dependent on the training and technique of the cleaning personnel. The testing also highlighted the importance of floor mat care and maintenance in preventing cross contamination of flooring surfaces. Finally, sampling revealed that the most heavily used routes between the doorways and interior areas must be the focal point in any cleaning and matting strategy.

Following the exact directions provided by a manufacturer when applying floor cleaning compounds is crucial to the success of a floor maintenance program. Proper training and outfitting of applicators must be monitored. Targeting cleaning and floor maintenance activities to those areas known for producing low slip resistance makes a slip and fall prevention program more efficient.

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The CNA study was extensively referenced in Russ Kendzior's new book, "Falls Aren't Funny."

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Allowing for all other factors, crew application of cleaning materials and cleaning techniques emerged as critical variables in CNA's study.

As expected and confirmed by our data, entryways exhibited low-traction characteristics. Floor mats in these areas were especially effective in reducing the migration of materials, such as dirt and water, into the facility. However, to maintain their effectiveness, the mats needed to be changed out at regular intervals before becoming saturated. Saturated entryway mats were observed to make the situation worse. Heavily soiled mats allowed contaminants to migrate to the clean public areas, significantly affecting slip resistance.

Areas with permanently installed mats and carpet runners need to undergo regular maintenance and thorough cleaning to remove the buildup of contaminants that could otherwise be tracked throughout a facility.



## RECOMMENDATIONS

Based on CNA's study and findings, general recommendations were made to our study participants. These recommendations can be applied by building owners and managers to help lower their risk for slip and fall incidents.

1. **Select high-traction, slip-resistant flooring materials when building, expanding or remodeling facilities.** Installation of such materials with proven high-traction characteristics on the front end is one of the most cost-effective ways to avoid slip-and-fall issues. To a great degree, texture determines a floor's slip resistance. Smooth floors made of glazed ceramic tile or terrazzo can be dangerously slippery under typical footwear when wet. Other floors with abrasives in their surface or specially textured metal plates can be quite slip resistant, even when wet or contaminated.

The best chance of reducing slip-and-fall accidents is during a facility's design phase when choosing floor materials. Some problem floors can be made safer by surface treatments, but others may need to be replaced or carpeted over, if possible. A good place to start is with flooring materials certified by the National Floor Safety Institute ([www.nfsi.org](http://www.nfsi.org)).

2. **Know what the "out-of-the-box" slip resistance is on the floor materials in a facility.** These numbers provide a baseline when considering changes to cleaning and floor maintenance practices. Have flooring COF audited after installation to confirm slip resistance. Use the NFSI/ANSI B101.1-2009 *Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials* as the test method.
3. **Select floor treatment, cleaning and maintenance products with proven slip resistance characteristics** that are compatible with the particular flooring surfaces in a facility. A good place to start is with products certified by the National Floor Safety Institute ([www.nfsi.org](http://www.nfsi.org)).
4. **Be alert for workers substituting cleaning materials or supplies.** Ensure that sufficient cleaning supplies are available.
5. **Ensure that floor cleaning and maintenance products are applied in accordance with the manufacturer's recommendations.**
6. **Verify with cleaning personnel that they are familiar with and are using the correct cleaning and maintenance product application procedures.** There must be a continuing effort to orient new employees to proper procedures and ensure they have the right skills to perform the job. If there is a change in personnel or contractor, monitor application to verify that manufacturers' recommendations continue to be followed.



"Placing quality slip-resistant floor mats in high-traffic or slippery areas will dramatically reduce your slips and falls."

Alan Cohan, Director of Hotel Sales,  
Shoes for Crews



## SUCCESS STORY 1

### Problem:

A large timeshare condominium vacation complex was experiencing 12 patron slip-and-fall injuries every month. Workers' compensation costs from slips and falls were costing the resort over \$350,000 a year.

### Change:

The resort changed to a high-traction floor care system and embarked upon a floor auditing system to check each unit and all common areas after cleaning.

### Results:

After 18 months, patron accidents dropped to less than 12 a year. Workers' compensation costs from slips and falls fell to less than \$30,000.



- 7. Remove any unauthorized or incompatible cleaning and maintenance products** and educate staff on the potentially dangerous consequences of using the wrong products on flooring surfaces.
- 8. Separate cleaning and maintenance materials and equipment** between the heavily soiled areas, such as food service areas, restrooms and break rooms, from other areas to reduce the likelihood of transporting a problem from one area to another. Color coding materials and equipment can provide instant recognition for personnel using them and can prevent usage of the wrong materials or equipment in an area of the facility.
- 9. Ensure that permanently installed features, like carpet runners and mats, are included in the maintenance and housekeeping program.** These materials need to be regularly inspected for the buildup of contaminants and for deterioration that could lead to the creation of slip, trip or fall hazards. Keep in mind that while mats reduce the likelihood of producing slips, improperly maintained mats can create trip hazards.
- 10. Implement a good mat program.** One of the surest ways to prevent the transmission of dirt, water and other materials from the outdoors to the interior of a facility is to implement a good mat program. Ensure that mats are frequently inspected and are checked regularly for wear and build-up of contaminants. A poorly managed and maintained mat program can significantly decrease the slip resistance of flooring surfaces.  
  
In warm weather, place an abrasive mat outside and an absorptive mat inside. In cold weather, put an absorptive mat just inside the door, followed by an abrasive mat. When mats get dirty or saturated, exchange them for clean ones. Offer plastic bags at the entrance for umbrella storage when it's raining so visitors don't shake out water from their umbrellas far into the building.
- 11. Limit the difference in height between flooring surfaces and mats to no more than ¼" to ½"** while frequently inspecting mats to ensure they have not buckled or curled. Ensure that mats are firmly secured to prevent migration and that the floor beneath the mat is clean and dry. Evaluate these changes in height regularly, since they can deteriorate and create trip hazards.
- 12. Make sure each area has good lighting.** Good visibility is essential for the prevention of accidental slips, trips and falls. Evaluate the facility and grounds during different times of the day and seasons of the year to determine whether lighting is adequate. Consider the earliest and latest times when visitors, pedestrians or employees are on the premises. Provide additional lighting for walking surfaces, as needed. Don't forget to include parking areas, stairways and loading docks. Promptly replace any burnt out bulbs.





“Traction Auditing’s experience with plaintiff attorneys has consistently shown that documentation that demonstrates compliance with accepted industry standards strengthens the defense against litigation.”

Brent Johnson,  
Chief Auditor of Traction Auditing, LLC.

**13. Regularly review all slip-and-fall incident reports associated with a facility and understand the critical factors associated with them.** Look for trends in location, time of day, etc., and focus staff training on cleaning procedures for these factors. Train workers on how to properly respond to slip-and-fall incidents. All incidents should be promptly investigated. Consult with legal counsel on the best way to document investigation results.

**14. Ensure that staff is well trained in spill prevention and response programs.** They must know where clean-up materials are located and how to properly use them in the event of an emergency. Instruct staff on the importance of reporting incidents and conditions that could result in incidents, even if none have actually occurred. Such reports will be the first indication of a potential issue that should be addressed.

**15. A walkway auditing program can help identify trends within a facility that can result in reduced slip resistance of flooring surfaces.** To be effective, the testing should be completed in a consistent manner, including more than a single set of measurements and following the NFSI/ANSI B101.1-2009 established floor auditing protocols.

**16. Maintaining open and clear communication between staff, cleaning personnel and the walkway floor auditor** is crucial to the identification of trends and the elimination of factors that could reduce the slip resistance of floor surfaces.

**17. Make sure stairs comply with local building codes and that nosings are easy to see** — even for a visually impaired person. Stairs need to have very uniform rise and run, and handrails that are firmly mounted and easy to grip. Avoid having confusing carpet patterns on stairs or steps that make it hard to tell where each step’s nose ends. On hard surfaces, abrasive tapes can help. Outdoor stairs must be slip-resistant when wet and should have stripes on each tread.

**18. Institute a program to regularly inspect all walkways, parking areas, stairs and indoor walking surfaces for condition and maintenance.** Repair any unstable surfaces, such as loose tiles or torn carpet. Secure any mats, rugs or carpets that don’t lie flat. Provide adequate clearances for doors, walkways and aisles. Keep floors clean and dry, and remove any obstructions or tripping hazards. Conduct routine monitoring of any walking surface that is periodically wet or icy, such as sidewalks, building entrances or food coolers.

**19. Maintain surveillance of potentially slippery areas and clean up spills before anyone falls.** Instruct maintenance personnel to use “wet floor” signs to mark contaminated areas until the contaminant can be cleaned up.

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## SUCCESS STORY 2

Problem:

A major national retailer had problems with patrons falling, especially during bad weather.

Change:

The retailer changed to a high-traction floor care system and began a floor auditing program.

Results:

During the first year, the retailer reduced accident costs by \$1.3 million and the insurance premium dropped by \$377,000.

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## FOUR STEPS TO AN EFFECTIVE SLIP-AND-FALL ACCIDENT INVESTIGATION

An effective slip-and-fall accident investigation may limit your liability, reduce claim costs and protect your business from further losses.

### 1. Provide assistance to the claimant.

Coordinate your response with local emergency responders and record actions taken to assist the claimant. As much as possible, protect the scene of the claim until help arrives.

### 2. Obtain a claimant statement.

As soon as possible, obtain a statement from the victim. It helps to have a standard statement form that captures the following information:

- Who was injured?
- When did it occur?
- Why did they think it happened?
- Where did it happen?
- How did it happen?
- What were the unsafe behaviors or conditions?
- Contact information
- Victim signature or statement

### 3. Secure physical evidence.

Take photos of the scene and obtain witness statements, including witness contact information. Secure any video surveillance tapes and then take corrective actions to prevent a reoccurrence of the accident.

### 4. Take corrective action.

Investigate the accident to discover the root cause and remove the hazard or take measures to protect the public from it. Apply the lessons learned to other areas on the premises.

The National Insurance Crime Bureau has noted a 77 percent increase in questionable slip-and-fall claims between 2008 and 2009.

Some indicators of a questionable slip-and-fall claim are:

- Subjective injuries
- Claimant is usually a transient
- The use of "props" to support the credibility of the claim
- Enthusiastic witnesses who come forward immediately
- Claimant has a positive claimant history
- Claimant uses post office boxes and has an answering machine
- Claimant can't produce positive identification
- Claimant has frequent changes of address and phone numbers
- Claimant threatens adverse publicity if the claim is not settled quickly

## CONCLUSION

In CNA Risk Control's view, floor traction auditing adds a powerful tool to our slip-and-fall prevention strategies. Armed with objective evidence, property managers can quickly identify problems in floor maintenance and the effectiveness of floor treatments. Acting on this information can result in significant savings in cleaning chemical dollars while improving floor slip resistance.





To learn more about CNA's other Risk Control resources, visit [www.cna.com/riskcontrol](http://www.cna.com/riskcontrol).



## REFERENCES

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