



# Risktopics

4-3.009 March 2011

## Slip resistance training: Walking and working surfaces

### Introduction

The cost of a slip, trip and fall claim is becoming noticeably more expensive. Higher medical costs, litigation and fraud, combined with an aging population are all possible factors that can contribute to the increase. Besides controlling costs, preventing injuries is a primary reason for taking appropriate action.

There are minimal slip resistance standards available that provide direction for creating safe walking and working surfaces. Many building codes and standards indicate that “surfaces must be slip resistant” but, provide no guidance or definition regarding what “slip resistant” really means.

Historically, only a slip testing device called the James Machine is utilized to test potential walking surfaces. The recognized standards used are UL 410-Slip Resistance of Floor Surface Materials and ASTM D2047-Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.

The product description sheet for most floor tiles or flooring products will indicate the product was tested with a James Machine and give the coefficient of friction results.

### So what is the problem?

With these standards, walking surfaces or treatments are deemed acceptable if they test at .50 coefficient of friction, when dry, under laboratory conditions. As many safety professionals know, clean dry walking surfaces are not slippery, especially with sensible rubber soled shoes.

Many buildings today are constructed with smooth hard surfaces that are esthetically pleasing. It is estimated that 80% of buildings are constructed with Vinyl Composition Tile (VCT) in the United States. When water or lubricants are tracked, leaked, or fall onto these smooth hard surfaces, the slip resistance is reduced dramatically and becomes very unsafe. It is this unexpected encounter with water, liquids or other contaminants on most floors that causes the majority of slips and falls.

When looking at improving the slip resistance provided by walking and working surfaces, there are four elements to consider: 1) surface composition; 2) shoes; 3) a person's gait; and 4) surface contaminants.

1. **Surface composition** – represents materials used to construct interior or exterior walking or working surfaces. Surfaces that contain asperities are a valued added concept. Webster's definition of asperities is "roughness of surface." Rough walking and working surfaces enhance available traction. Surfaces that do not have asperities or roughness are problematic when wet or contaminated.

ASTM F1637-10 Standard Practice for Safe Walking Surfaces, a highly regarded consensus standard, indicates that exterior walkway surfaces shall be slip resistant under expected environmental conditions and use. Interior walkways that are not slip resistant when wet shall be maintained dry during periods of pedestrian use.

With some establishments, appearance is a high priority. Marble, terrazzo, granite, ceramic or other smooth hard tile surfaces are installed. When water or other contaminants are added, the surface slip resistance is similar to ice.

With buildings furnished with VCT or other smooth hard surfaces, the duty of the business establishment would be to maintain those surfaces "dry during periods of pedestrian use."

2. **Shoes** – Shoes with slip resistant properties can aid in providing safe passage through a wet or contaminated work area. While not a highly promoted concept for some industries, such as retail, slip resistant footwear can be a significant factor in controlling unexpected slips and falls. Businesses must do their homework when looking at slip resistant footwear. The quality and effectiveness of slip resistant footwear should be researched and tested.
3. **Gait** – Modification of a person's gait is obviously not a practical solution for helping control slips, trips, and falls. However, business owners/operators should consider providing customers, visitors and associates adequate notice when floors are wet or contaminated. This could reduce some slips and falls and aid in claim mitigation. The failure to post wet floor signs is commonly documented in litigated cases, from a customer, visitor and associate perspective.
4. **Contaminants** – substances such as water, liquids, ice, slush, lotions, grease, oil, powders or other debris that could cause a slip. Controlling contaminants in existing buildings, with and without slip resistant walking surfaces, is the most significant action that can be taken to control losses related to slips, trips and falls.

## Did you know?

- Slips, trips and falls are the most controllable accident type.
- Businesses in the U. S. expense billions of dollars annually on STF incidents.
- Many premises or general liability claims are not reported, due to self-insured programs.
- Slips, trips and falls are underreported. Some contusions, fractures, lower back strains, etc., are actually the result of slip, trip and fall incidents.

## Possible prevention solutions

Management's role in the slip, trip and fall prevention process is to set the standards and when visiting facilities, set the example. Never walk by an unsafe act or unsafe condition.

While we know that it may be challenging to change the surface composition to make walking surfaces safe throughout a location, it may be possible to modify some key areas where many incidents occur. The first possibility is to review facility entrances. Research tells us that many slip, trip and fall events occur at building entrances, usually as the result of inclement weather. Facilities that are normally provided with VCT should avoid placing that tile in vestibules. Instead, look at more permanent solutions.

A concept to consider would be to add permanent matting or gridded systems. This may require creation of a recessed area to house the permanent system, but the return on investment could be realized within the first year as a result of not having incidents in those areas. Permanent matting or gridded systems will act as a scraper/wiper application on shoes, meaning that the water, slush, etc. are removed considerably from the bottom of footwear.



Vestibule with inlaid or recessed gridding  
\*Courtesy of Lord & Taylor



Vestibule with permanent matting tiles  
[www.doormatsandmore.com](http://www.doormatsandmore.com)

To finish the job, “quality” entrance matting is suggested for just inside the vestibule area. Matting that reaches at least 15 feet into the facility is recommended. Quality mats should lay flat, be free of warped or curled edges, have a slip resistant backing, be beveled to prevent trips, be durable and easily cleaned. This section of matting can act as a second wiper on footwear to remove additional water, slush and other contaminants.



Customized entrance mat examples



\*Pictures Courtesy of Lord & Taylor

Permanent matting systems in vestibules and customized walk-off mats inside entrances allow companies to engineer out and reduce daily exposures. One national retailer was able to pay for their customized entrance mat program in eight months due to the reduction in slip, trip and fall losses.

Entrance mats pictured are utilized 365 days per year as a best practice and are not brought out just during inclement weather. Dirt and debris on shoes will be scraped off during dry conditions and keep walking surfaces cleaner.

Cleaning protocols provided by the vendor should be followed for gridding, permanent matting systems and entrance mats to ensure they function properly and extend the life of the products.

Here is a word of caution. When purchasing quality entrance mats, measure the height of the door thresholds before purchase or consult with a qualified vendor. Mats too high off the floor will restrict entrance doors from opening or closing. Also, gridding purchased should be reviewed in detail. Some gridding types available may lack desired slip resistant qualities.

## Restroom and break room floors

The next area of consideration would be restroom floors. Many restroom incidents indicate slips and falls on wet floors. Leaks due to malfunctioning equipment and restroom activity, especially around sink areas, create unsafe conditions.

This is an opportunity area for most businesses. The primary cause is a lack of slip resistance on the walking surface. If a remodel or new store project is underway, why not install slip resistant flooring?

Break rooms could be another area where slip resistant materials could be installed out of public view to provide safer walking surfaces.

## Floor cleaning basics

Some investigations into unexpected slips and falls show maintenance or floor cleaning workers are not following cleaning protocols. Often, workers fail to follow manufacturer cleaning product instructions such as not properly diluting waxes or not following specific cleaning regimens. With this high turnover industry, training is typically inadequate and cleaning standards may suffer as a result.

Retail stores with restaurants or grocers with meat cutting activity may need to ensure proper cleaning protocols are followed daily to avoid polymerization. Polymerization occurs when grease and surface dirt or residue are not properly removed from floor surfaces.

Aggressive bristle brushing daily with hot water and an appropriate degreaser for the floor type are normally used to clean these areas. A polymerized floor may look clean but the asperities or the surface roughness of the floor tile have been covered over, creating less slip resistance for workers.

Grease in kitchens and meat counter areas may also be tracked to other areas of the facility. Spot cleaning during the day, as well as sound cleaning after hours will need to be completed to control slips and falls.

## Floor treatments

Flooring treatments are another area to explore, but proceed with caution. Some treatments or etching products will damage VCT or other flooring surfaces. Due to the hazardous chemicals of the products utilized, flooring treatments to increase slip resistance should be applied by a licensed professional service.

One method to increase friction is to apply an etching product that creates asperities in the existing surface. Another method would be to apply a product that adds a layer of asperities or roughness onto the surface.

Floors that are treated will need to be cleaned according to the manufacturer's specifications to ensure the slip resistant properties created do not get filled in with dirt and grease. Floor treatments normally have a multiyear warranty and will need to be redone as the slip resistant qualities wear down.

## Painting of surfaces

Exterior surfaces that are painted should have abrasives added to prevent creating a slippery walking surface when wet. Interior walking surfaces that are painted can have the same exposure when wet. If painting an automotive back shop or warehouse area, ensure adequate slip resistance is considered and incorporated during the painting process.

## Safety accountability for leased properties

Many organizations lease retail space and technically have no responsibility for exterior walking surfaces. When a customer slips and falls outside of a leased location, there is a tendency for the victim to file suit against the retailer, in addition to the property owner. When an associate slips and falls on the leased property, there could be a workers' compensation claim. The employer may be liable for the claim and find it difficult to seek compensation through the property owner in the form of subrogation that may take several years to achieve.

Our thoughts on this issue would be to put the property owner on notice when unsafe conditions are noted and keep track of that communication. Both management and associates should keep an eye out for unsafe exterior walking surface conditions and report them up the chain of command and eventually to the mall or property owner. A good example would be to report inadequate snow removal or black ice/ refreezing conditions.

## Spill response / spill clean up

As stated earlier, keeping VCT or other non slip resistant surfaces dry is the biggest opportunity to ensure everyone's safety. Many businesses do a great job in this area and work to keep spills or other liquids off walking and working surfaces. A "clean as you go" or "see it, fix it" approach is utilized.

Management must establish the program and convey the importance of the program to all associates.

## Conclusion

It is by your actions that others determine their roles in preventing incidents. Setting the standards and setting the example are two ways your management team can help reduce slip, trip and fall exposures, increase customer service, and potentially add dollars to your bottom line.

## References

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