

Slips and Falls – Funny Until Someone Gets Hurt

Introduction

Admit it. You have laughed, chuckled, or at least smiled when watching [America's Funniest Videos](#) and they get to the one where someone slips and falls. Slips and falls have been a staple of the comedy circuit since the ol' slip on a banana peel. And in most cases when someone slips and falls, the first reaction of the fallen is embarrassment – looking around to see if anyone noticed. Hopefully that is the only result.

According to the BLS, in 2009 there were over 200,000 work-related injuries related to falls that resulted in days away from work. When non-workplace injuries are considered, the numbers go up dramatically (especially for those over 65) and includes 2.8 million falls involving children – annually! So despite the tie to comedy, slips are serious business!

The Basics of Walking

In Monty Python's "The Ministry of Silly Walks" skit, John Cleese's character breaks down a walk into its various components. In terms of understanding how we slip, he provides valuable insight. Physical therapists look at the stance (when our foot is on the ground) and the swing (foot is not on the ground). There is the push off from the front of the foot, extending the leg forward, and then landing – typically on the heel of the foot. Repeat. Repeat – or, to put it more simply "put one foot in front of the other".

Causes of Slips

A slip occurs when the friction between your foot/shoe and the walking surface is not sufficient and your foot moves more easily than expected and slides backward. As a result, your upper body is no longer aligned over your legs and gravity goes to work. (A trip occurs when the forward process of your leg is stopped. Trips can typically be addressed through housekeeping and engineering controls. Slips are a little more complicated.)

Ultimately, the most common reason for a slip is when the friction between the bottom of the shoe and the floor surface is less than expected. The National Floor Safety Institute indicates that fifty-five percent of falls are from walking surfaces, twenty-four percent are from footwear, ten percent are due to lack of warning, eight percent are due to lack of training, and three percent are due to fraud.

Surfaces are considered slip resistant when their static coefficient of friction is 0.5. It doesn't take much to increase the "slipperiness" of a surface – a quarter size drop of water is sufficient (if that's where you step). Other contaminants on a smooth surfaced floor can have the same effect. Different personal

characteristics, such as age, illness, and obesity can increase the static coefficient of friction needed to help prevent slips.

Standards

Although the Occupational Safety and Health Administration announced in May 2010 that they were publishing rulemaking to prevent injuries from slips, trips, and falls, the primary focus of this is to reduce slips and trips at elevation – and the potentially fatal injuries that may occur. The American National Standards Institute published ANSI A1264.2-2006, Provision of Slip Resistance on Walk/Working Surfaces to address provisions for reducing slip hazards, how materials should be tested and the equipment that should be used, and guidelines for slip resistance.

The National Floor Safety Institute is also working with ANSI on Safety Requirements for Slip, Trip, Fall Prevention to further identify the testing procedures for floor surfaces under various conditions. The hope is to make it easier to select flooring materials in the future.

In terms of testing footwear, a contributing factor in twenty-four percent of the slips, there are ASTM International (formerly known as the American Society for Testing and Materials) Test Methods for testing non-contaminated surface/footwear (ASTM F609, F1677, and F1679) as well as contaminated surface/footwear materials (F1677 and F1679).

In terms of surface material selection, there is the ASTM F802 *Standard Guide for Selection of Certain Walkway Surfaces When Considering Footwear Traction*. For footwear selection, there is ASTM F1240, *Standard Guide for Ranking Footwear Bottom Materials on Contaminated Walkway Surfaces According to Slip Resistant Test Results*.

Slip Hazard Prevention

As previously mentioned, the primary causes of slips are the working surface, footwear, lack of warnings, and lack of training, and fraud. In terms of prevention, most of the hazard prevention is aimed at the facility owner. Some of the key areas include installation of proper flooring materials; use of adequate matting at entrances - at least 15 feet; maintenance of floor materials (no holes in the concrete, use of effective cleaning materials for the surface and the contaminants); use of “wet floor” signs; implementation of a good snow removal program, and increased lighting at key entrances. There are also chemicals, coatings, and treatments that can increase the slip resistance of a floor surface.

But what about those areas that we don’t control? What about field workers who deal with outdoor conditions on a regular basis? That is when proper footwear is a must.

If you are working outdoors, the starting point for preventing falls is a good pair of boots that extend over your ankle. They should have sufficient tread (think diamond type pattern) to allow the water/snow to move out of the way, and enough support for your ankle in case the edge of the sidewalk, or the gopher hole is not obvious. There are boots that the manufacturers say are “slip

resistant”. It is important to determine what, if any, testing was conducted to verify this claim – and under what conditions is the footwear truly slip resistant.

Even in a controlled work environment, be aware of the height of the shoe heel (and yes, this applies to men as well). The sole of the shoe may have a great tread, but it typically does not extend to the heel.

Ice – the Ultimate Slippery Material

Earlier we mentioned that floor surfaces are considered to be slip resistant when their static coefficient of friction is 0.5 or above. The static coefficient of ice against rubber (as in the rubber sole of a shoe) is 0.06 – far removed from what is considered a slip-resistant interaction. Throw a little snow on top of it so you can’t identify the ice, and the chance of a fall significantly increases. Let us not forget wet leaves, mud, and just plain old wet shoes/boots – all of which explain the increase in slips and falls from October to March.

What footwear is appropriate for icy conditions? Ice cleats are a requirement when working in the ice in snow. Many police departments are requiring ice cleats for those officers walking the beat. The key consideration with ice cleats, however, is that they need to be easy to take on and off. Most are NOT designed to be worn while driving or when indoors.

Don’t Add to the YouTube Collection

There are many things that can be done to prevent slips and falls – even if you live in the snowbelt. In situations, where you have control of the floor surfaces, maintain the flooring with both regular cleaning, provide enough mats to prevent water and contaminants from being tracked, ensure there is appropriate lighting, and provide warning signs when wet conditions are expected.

If you do not have control of the floor surfaces, be conscious of your footwear choices. If you are going to be walking or working in outdoor conditions, wear appropriate boots with good tread. You can always change shoes when you go inside. Consider ice cleats if the outdoors is your main work environment. And be safe out there.

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