

## About the Author

**George Sotter** is a registered Professional Engineer who specializes in prevention and investigation of slip, trip, and fall accidents. He has investigated accidents from



Hawaii to Bermuda and has testified in court as an Expert Witness, for the plaintiff and for the defense. He has personally conducted thousands of slip-resistance tests. He's a member of eight slip resistance committees in the United States, United Kingdom, and Australia. He conducted landmark research in causes and prevention of slips by steel erection workers, who work at height and are at high risk of death when they fall for any reason. That project, sponsored by the OSHA/SENRA Steel Coalition, was the largest slip-and-fall research project to date for any particular occupation. He is certified by the City of Los Angeles for floor slip resistance testing. His clients include attorneys, builders, floor treatment or maintenance companies, flooring manufacturers and vendors,

forensic consultants, insurance companies, property owners and managers, and restaurant chains.

George has 30 years of experience as a consulting engineer and some 35 publications in such periodicals as *Scientific American*, *Occupational Health and Safety*, international symposia, and industry-specific journals. He earned a Bachelor of Science degree from the Pennsylvania State University and a degree of Doctor of Philosophy in rocket science from the University of Sheffield, England.

# Contents at a Glance

<b>Part I: Slips Happen .....</b>	<b>1</b>
Chapter 1: How to Use this Book .....	3
Chapter 2: What's Your Motivation? .....	7
Chapter 3: Background on Slips and Falls .....	11
Chapter 4: Accidents and Financial Losses .....	27
 <b>Part II: About the Causes of Slips, Trips and Missteps.....</b>	 <b>37</b>
Chapter 5: Evaluate Flooring for the Task Afoot .....	39
Chapter 6: The Other Partner: Footwear .....	75
Chapter 7: Stairs, Ramps and Other Elevation Changes .....	87
Chapter 8: Outdoor Slips, Trips and Falls .....	103
Chapter 9: Visual Effects: Illumination, Distractions, and Warnings .....	119
Chapter 10: Floor Care: What Can Go Wrong? .....	125
 <b>Part III: Play Defense! .....</b>	 <b>131</b>
Chapter 11: Assess Risk of Your Existing Flooring .....	133
Chapter 12: Risk Reduction Techniques .....	143
Chapter 13: Your Plan for Cutting Risk .....	153
 <b>Part IV: Legitimate Lawsuits and Fraud.....</b>	 <b>165</b>
Chapter 14: Too Late! The Lawsuit .....	167
Chapter 15: The Sting: Slip-and-Fall Fraud .....	179



# How to Use this Book

Since the mid-1990's, a "slip-and-fall revolution" has been quietly occurring in some of the world's most developed nations. Slip-and-fall accidents, for centuries considered an inevitable part of civilized life, are now largely preventable. The revolution started in Germany and spread to other European countries, and as far as Australia. Some employers in the United States are beginning to get more involved in the campaign to eliminate these accidents, which are very costly financially, and in too many cases are disastrous — or even fatal — for the victims.

Falling gags have been a part of the humor of some great comedians such as Chevy Chase, silent movies' Charles Chaplin, and Michael Richards (Kramer on television's *Seinfeld*). Football and basketball players often have falls without apparent injuries. This tends to condition us to think of falls as a trivial, even comic, matter. However, unexpected falls by pedestrians on floors and stairs can, and frequently do, produce horrendous injuries, requiring huge medical expenditures and sometimes creating serious and permanent disabilities.

Our purpose in this book is to help you to prevent accidents that are caused by slips, trips, and missteps by people on foot, whether at work or on their own time. For brevity we'll occasionally use the term, "slips" to include slips, trips, and missteps, since the word, "slip" can also mean "a mistake or error."

A few vendors are referenced in this book simply as starting point to aid the reader in making enquiries. These references are neither endorsements nor advertisements, and they are by no means a complete list of potential vendors. Please see your classified telephone directory and the World Wide Web for other possibilities. Since quality of a vendor's products and services may vary from one month to another, it's not feasible to recommend vendors in this book.

The book has four parts. The first part gives some general background and case studies that will help you understand the magnitude and causes of the problem. The second part talks about particular aspects of floors, footwear and other factors that



lead to falling accidents. The third part gives some procedures to use in finding, evaluating and eliminating hazards. Part IV discusses lawsuits and slip-and-fall fraud.

## **Part I: Slips Happen**

Part I shows you the extent of the slip-and-fall problem, both in human terms and in financial terms. It explains the five ingredients of a slip-and-fall incident, as well as some of the simple physical laws that help understand why slips occur. Case studies include jury verdicts of total damages as high as \$10,000,000, with awards to the injured parties of up to \$6,500,000.

Use this part to help you understand how important slip and fall hazards could be to you. It will also help you understand the basic physical principles used to evaluate hazards.

## **Part II: About the Causes of Slip, Trip, and Misstep Claims**

The characteristics of footwear and floors cause many slips or trips resulting in injuries. Different circumstances apply in various situations: stairs and ramps, barefoot areas, outdoor walkways, etc. In this part, we discuss why these different circumstances can result in an accident, and how the characteristics of flooring and footwear need to be *appropriate to the situation*. Chapter 5 presents guidelines for floor slip resistance for 160 different situations. Chapter 6 helps you to recognize some of the qualities that footwear needs to give good traction.

This part gives you valuable guidelines for accident prevention. Use it to help you identify existing hazards and avoid creating new ones.

## **Part III: Play Defense!**

You can be a "victim" of a slip-and-fall accident in either of two ways. You could be the pedestrian who has a painful, disabling and expensive accident, or the home-

owner, tenant, or building owner who can experience financial loss — either directly or in the form of insurance premium increases.

This part gives some procedures to follow to help you prevent slips, trips and missteps that result in falls. The procedures apply to footwear and to both new and existing flooring. Use this part to help you assess relative risks of slips and falls, and preventive methods, so that you can apply remedial efforts where you most need them.

## **Part IV: Legitimate Lawsuits and Fraud**

Many slip-and-fall claims settle through insurance channels with little or no dispute. Sometimes, however, a claim goes into litigation. Both sides in a slip-and-fall case need to take certain precautions immediately after an accident to protect them in case of a dispute.

Fraudulent claims may or may not result in a lawsuit, but there are a few hints that may help you assess whether you're the target of a slip-and-fall fraud. Your best protection against fraud, though, is to follow good floor-safety principles as outlined in this book so that you aren't vulnerable to charges that you caused an accident by your negligence.

Use Part IV to help you decide what to do when a slip-and-fall accident has occurred, or appears to have occurred. Your actions immediately following the accident may be important later.





(a)



(b)



(c)



(d)



(e)



(f)

[PFI Test and Research Institute for the Shoe Industry]

**Figure 5-1.**

A walk and a slip-and-fall in the variable-angle ramp test. The walker raises or lowers the slope half a degree at a time (at a speed of one degree per second) using the controller he holds in his right hand.



Class	Description	R
0	General work rooms and public-accessible areas	
0.1	Entrance areas likely to get wet	10
0.2	Stairs	9
0.3	Rest rooms	10
9	Restaurants and other catering establishments	
9.1	Kitchens in the catering trade (restaurant kitchens, hotel kitchens)	
9.1.1	Up to 100 meals per day*	11
9.1.2	More than 100 meals per day*	12
9.2	Kitchens catering for homes, schools, kindergartens, sanatoria	11
9.3	Kitchens catering for hospitals, clinics	12
9.4	Large kitchens catering for industrial and university canteens, and contract catering*	12
9.5	Food preparation kitchens (fast food kitchens, snack bars)*	12
9.7	Coffee and tea kitchens, hotel garni kitchens and ward kitchens	10
9.8	Washing-up rooms	
9.8.2	Washing-up rooms for 9.2	11
9.8.3	Washing-up rooms for 9.3	12
9.9	Dining rooms, guest rooms, canteens, including serving counters	9
11	Sales outlets, shops	
11.7	Florist shops	11
11.10	Shops, customer rooms	9
11.12	Cash register areas, packing areas	9
11.13	Serving counters for bread, cakes and pastries, unpacked goods	10
12	Health service rooms	
12.6	Washrooms of operating theatres, plastering rooms	10
12.9	Operating theatres	9
12.10	Wards with hospital rooms and corridors	9
27	Financial institutions	
27.1	Counter areas	9
28	Garages (with the exception of the areas specified under Number 0)	
28.1	Garages, car parks	10
29	Schools and kindergartens	
29.1	Entrance areas, corridors, assembly halls	9
29.2	Classrooms, group rooms	9
29.4	Rest rooms, washrooms	10
*Use raised-relief surface where indicated, for dispersal of liquid spills		

Table 5-1.

A few selected guidelines for floor slip-resistance rating R



## INDEX OF MAJOR CLASSES IN THIS TABLE

<i>Description</i>	<i>Class</i>	<i>Description</i>	<i>Class</i>
Aircraft service and repair	24	Iron and other metals, treatment	21
Automobile service and repair	23	Kindergartens	29
Beverage production, wet areas	8	Kitchens, commercial	9
Bread production	4	Laundry	13
Cake production	4	Leather production	15
Car parks	28	Margarine, fats and oils, mfg.	1
Catering establishments	9	Meat processing	5
Ceramics industry	17	Metal processing & workshops	22
Cheese production	2	Milk processing	2
Chocolate production	3	Oils and fats, storage areas	20
Cold stores	10	Paint shops	16
Concrete, cast, factories	19	Pastry production	4
Confectionary production	3	Public-accessible areas	0
Deep freeze rooms	10	Restaurants	9
Delicatessen production	6	Sales outlets	11
Fast-food restaurants	9	Schools	29
Fats, storage areas	20	Sewage treatment plants	25
Financial institutions	27	Shops	11
Fire departments	26	Slaughtering	5
Fish processing	6	Sports stadiums	30
Fodder concentrate production	14	Stone polishing	18
Food production, wet areas	8	Storage areas for oils and fats	20
Garages	28	Supermarkets	11
General work rooms	0	Textile production	15
Glass and stone polishing	18	Vegetables, processing of	7
Health services	12	Vehicle repair	23
Hospitals	12	Work rooms, general	0

**Table 5-2. (continued on next five pages)**  
 Guidelines for flooring slip resistance where shoes are worn