



Standard Guide for Selection of Certain Walkway Surfaces When Considering Footwear Traction¹

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1. Scope

1.1 This guide is intended to assist in the selection of walkway surfaces where the presence of foreign materials may produce the danger of a slip or a fall.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Summary of Guide

2.1 Foreign material on a walkway surface often causes slip and fall accidents. A slip can occur because foreign material presents an additional interface between the shoe bottom and a walkway surface. The interface between the shoe bottom and the walkway is replaced by an interface between the shoe bottom and the foreign material, and another between the foreign material and the walkway. Although the foreign material should be removed, it is not always easy to remove prior to use of the walkway or as the foreign material is spilled. In very few cases can shoe bottoms be designed to provide adequate slip resistance to foreign materials. Instead, walkway surfaces should be self-cleaning as they are used by pedestrians.

2.2 This guide sets forth factors to consider in the design of walkway surfaces likely to be affected by foreign materials that may result in slips. These considerations concern metal walkway materials, abrasive materials used on walkways, and climbing systems.

3. Significance and Use

3.1 When the conditions are such that foreign materials can come between shoe bottoms and a walkway surface, efforts should be made to design the walkway surface to remove the foreign material from between shoe bottoms and the walkway surface.

3.2 This type of slip hazard is often found in manufacturing and maintenance processes where foreign materials are frequently present on walkway surfaces. Examples are: food preparation and processing areas, rendering operations, transportation and cargo handling activities.

4. Procedure

4.1 The presence of foreign materials on walkway surfaces often causes people to slip. Most foreign materials, if present on a walkway, will lower slip resistance. A foreign material in contact with a shoe and a walkway presents two additional surfaces: the top of the foreign material mating with the bottom of the shoe sole, and the bottom of the foreign material mating with the walkway surface. Obviously, keeping the walkway surface clean of foreign materials is the best method to eliminate this potential hazard. This is not always possible, however, while routine operations are being performed.

4.2 Treatment of the walkway surface with an abrasive material is a frequently used remedy when the foreign substance is soft or of low viscosity. The function of an abrasive walkway surface is often misunderstood. The ideal approach to reduce slipping on walkways is to eliminate the two additional surfaces caused by the presence of the foreign material. A sharp abrasive incorporation into the walkway surface will allow foot pressure to break up the foreign material and force it into voids between peaks of the abrasive. This process retains two surfaces: the walkway and the shoe bottom. Important considerations in the selection of an abrasive treatment are: wear resistance, resilience of abrasive material, density of abrasive treatment, means of attachment of treatment to the walkway surface, sanitary conditions, and appropriate abrasive size.

4.2.1 The type of abrasive used is also an important factor to consider. For instance, sand, bonded to a floor surface, works well when first applied because sand is a relatively soft material. However, the sharp edges of the sand particles are easily rounded by wear, and foreign material tends to remain on top of the abrasive particles. Proper selection of abrasive material depends upon the particular circumstances of the problem area.

4.2.2 Because some abrasive particles are brittle, they break off during use and become ineffective.

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4.2.3 If an insufficient number of abrasive particles are used for treatment of a walkway surface, the viscous foreign material will not be broken up sufficiently. As a result, the treatment will be ineffective because the walkway surface will not contain enough voids to receive the foreign material.

4.2.4 Secure bonding of abrasive treatment to a walkway surface is essential for long-term effectiveness and control of the overall cost of maintaining the treatment.

4.2.5 For some applications, the particle size should not be so large that it is difficult to remove foreign materials from the deep voids. Large particles would be particularly objectionable in food process or preparation areas. Smaller abrasive particles can be used in these areas, and cleaning can be accomplished with proper techniques. In some cases, such as places in which engine maintenance is performed, a large abrasive grit may be appropriate. Grit is sized with a screen; the lower the identification number of the grit, the larger the grit size. With low-viscosity liquids or small, solid substances on a floor surface, a relatively small grit will provide voids deep enough to allow shoe soles to have direct contact with the floor surface. Conversely, high-viscosity liquids or larger solid substances require larger grit sizes. Cleaning is usually easier with a small grit size. It is difficult to specify the exact grit size for each

application. Grit sizes smaller than No. 80 are usually ineffective. When there is doubt about the proper grit size, test patches should be installed in the area of concern. Consultation with a manufacturer of abrasives may also be helpful in the selection of the proper grit size. As a cleaning aid, a light coating of resin such as polyurethane is often applied after an abrasive floor surface is installed.

4.3 Expanded metal or open metal grilles (available with various types of surface configurations) may be more appropriate for avoiding build-up of some foreign materials or of some natural elements, such as snow, ice, and rain.

4.4 Certain surfaces are often overlooked when walkway slipperiness is considered, for example, ladder rungs and steps.

4.4.1 The surface in contact with shoe bottoms on access and exit is not the only consideration in prevention of falls from these systems. Adequate grab handles are important, with location based on a criterion of three-point suspension for a climbing person. The three points to be in contact with the system at all times are: two hands and one foot, or two feet and one hand.

4.4.2 Step size, distance between steps, and the diameter and location of grab handles should be based on good ergonomic design.

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