Designation: F2965 – 13

Standard Guide for Selection of Walkway Surfaces and Treatments When Considering Aggressive Contaminant Conditions in Commercial and Industrial (Not Including Construction) Environments[1]

This standard is issued under the fixed designation F2965; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide is intended to assist in the selection of walking surfaces and treatments where the foreseeable presence of aggressive contaminants produces the danger of a slip and fall injury events in commercial and industrial (not including construction) environments, for persons wearing appropriate footwear.

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. Referenced Documents

2.1 *ASTM Standards:*[2]

F1646 Terminology Relating to Safety and Traction for Footwear

3. Terminology

3.1 For general definitions of terms, refer to the Terminology F1646.

3.2 *Definitions:*

3.2.1 *aggressive contaminants, n*—substances that create a gross separation between the footwear bottom and the walkway surface.

3.2.2 *self-cleaning, adj*—property of a walkway surface or treatment where foot pressure breaks up or displaces, or both, a contaminant on a walkway surface in a manner that restores direct contact between the walkway surface and the footwear bottom in contaminated conditions.

4. Summary of Guide

4.1 Slip and fall injury events are often caused by contaminants on a walkway surface. Slips that occur because of the presence of contaminants result from the additional interface between the footwear bottom and the walkway surface. The interface between the footwear bottom and the walkway surface is replaced by an interface between the footwear bottom and the contaminant, and another interface between the contaminant and the walkway surface.

4.2 Aggressive contaminants create a gross separation between the footwear bottom and the walkway surface, where the least dimension of solid contaminants or the depth of highly viscous liquid contaminants is greater than the height of the walkway surface protrusions or asperities, and/or greater than the depth of texturing or tread of footwear. Aggressive contaminants are exemplified by high viscosity liquids or semi-liquids such as juicy fruits and vegetables, rounded objects that act as roller bearings such as rounded stones and gravel on hard smooth surfaces, manufacturing scraps and byproducts on the walkway surface, snow, ice, mud, and other similar contaminants.

4.3 Primary control of contaminants should be to eliminate or contain contaminants at the source to prevent contamination. Secondary control of contaminants, if needed, should be to establish methodologies and procedures to promptly remove contaminants when introduced onto a walkway surface. Walkway surface safety enhancement is recommended where the presence of aggressive contaminants cannot be practicably and reliably removed from or otherwise controlled on a walkway surface to acceptable levels as determined by a competent safety analysis.

4.4 The primary enhancement method is to increase the slip-resistance of the walkway surface. Walkway surfaces with prominent projections of sufficient height or sharpness, or both, may be of benefit. Walkway surfaces that are self-cleaning as they are used by pedestrians may be of benefit. Self-cleaning, as a property of a walkway surface or treatment, is where foot pressure breaks up the contaminant on the walkway surface or otherwise forces the contaminant into voids between openings,

[1] This test method is under the jurisdiction of ASTM Committee F13 on Pedestrian/Walkway Safety and Footwear and is the direct responsibility of Subcommittee F13.50 on Walkway Surfaces.

Current edition approved March 1, 2013. Published April 2013. DOI: 10.1520/F2965-13.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

peaks of abrasive material or texture, or both. The intent of the self-cleaning process is to restore direct contact between the walkway surface and the footwear bottom. Examples of self-cleaning treatments include grates and spike-like asperities. In addition or alternatively, special footwear may be designed to enhance slip resistance, such as grit impregnated or deep-tread footwear bottoms, attached snow treads, ice spikes, and others, or both.

5. Significance and Use

5.1 The slip hazard from aggressive contaminants on walkway surfaces is often found in commercial and industrial (not including construction) settings including fresh fruits and vegetables open display areas, manufacturing processes, food preparation and processing areas, rendering operations, transportation and cargo handling activities, petroleum drilling platforms, and other similar environments.

5.2 Ladder rungs, steps and other similar means of access and egress should be considered as walkway surfaces in slip-resistance analyses in commercial and industrial (not including construction) environments where aggressive contaminants are determined to be a factor.

6. Procedure

6.1 Treatment of the walkway surface with abrasive materials is a recommended slip-resistance enhancement when the contaminants are soft or viscous. To be effective, the abrasive material must have prominent projections of sufficient height or sharpness, or both, to be self-cleaning in the presence of the foreseeable contaminants. Other important considerations in the selection of an abrasive treatment include bonding of the abrasive to the walkway surface base material or other means of attachment of treatment to the walkway surface; wear resistance or resilience of abrasive material; distribution, dispersion, and density of abrasive treatment; sanitary and sanitation requirements, and others. Higher-viscosity liquids or larger solid substances require larger grit sizes. Proper analyses are required to select the proper grit size; testing may be advisable.

6.2 Walkway surfaces and treatments with slip resistance enhancement properties that are subject to wear or other forms of degradation should be monitored for performance, and repaired or restored as needed.

6.3 Expanded or open grilles may be necessary for solid, large-dimension aggressive contaminants to accommodate the self-cleaning function, or otherwise to avoid build-up of some aggressive contaminants. The walkway surface of the grille bars should be slip-resistant as well.

6.4 Any exposed edges of materials or treatments that create tripping hazards shall be treated as required by appropriate codes and standards.

7. Keywords

7.1 aggressive contaminants; footwear; self-cleaning; slip resistance; treatments; walkway surfaces