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## TECHNICAL BULLETIN

### Understanding Slip-Resistance

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**It is important to note that there is no separate standard for decking when it comes to slip resistance. All surfaces fall under the standard for tile flooring.**

#### **Past - OSHA Standard 29 CFR 1910 Subpart D / ADA (Americans with Disabilities Act)**

"Slip-resistance. a reasonable measure of slip-resistance is the static coefficient of friction (COF). A COF of 0.5, which is based upon studies by the University of Michigan and reported in the 'Work Surface Friction: Definitions, Laboratory and Field Measurements, and a Comprehensive Bibliography,' is recommended as a guide to achieve proper slip resistance. A COF of 0.5 is not intended to be an absolute standard value. A higher COF may be necessary for certain work tasks, such as carrying objects, pushing or pulling objects, or walking up or down ramps."

The ADA Standards for Accessible Design adopted the OSHA Standard in "Section 4.5 Ground and Floor Surfaces:"

- "General. Ground and floor surfaces along accessible routes and in accessible rooms and spaces, including floors, walks, ramps, stairs, and curb ramps, shall be stable, firm, slip-resistant, and shall comply with 4.5."

Specifically, the ADA discusses coefficient of friction requirements in appendix A4.5.1:

- "The Occupational Safety and Health Administration recommends that walking surfaces have a static coefficient of friction of 0.5."

**The standard test methods used to determine the Static Coefficient of Friction, ASTM 1678 and ASTM 1679, were withdrawn in 2005 and 2006 and replaced with ASTM C1028, which was withdrawn in 2014 with no replacement, as none of these test methods addressed the Dynamic Coefficient of Friction (walking slip-resistance).**

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## **Present – IBC (International Building Code)**

**In 2012 the IBC adopted NSFI –B101 and ANSI 1264 slip-resistance standards replacing OSHA/ADA standards.**

ANSI/NFSI (American National Standards Institute/National Floor Safety Institute)

NSFI – B101 and ANSI 1264 establish traction standards and methods for measuring Static Coefficient of Friction (SCOF) and Dynamic Coefficient of Friction (DCOF). Static Friction is the friction between two surfaces that are not in relative motion to each other (friction while standing). Dynamic Friction is the friction between two surfaces that are in relative motion with respect to each other (friction while walking). The standards are established as follows:

### **Static – Minimums**

- High Traction (SCOF of 0.6+)
- Moderate Traction (SCOF of 0.4 – 0.6)
- Low Traction (SCOF of <0.4)

### **Dynamic- Minimums**

- High Traction (DCOF of 0.42+)
- Low Traction (SCOF of <0.3)

## **Tropical Forest Products Decking Compliance with IBC Standards**

Tropical Forest Products Ipe Decking Products have been tested in accordance with ANSI B101.1 Test Method for Measuring Wet Static Coefficient of Friction (SCOF) of Common Hard Surface Floor Materials and ANSI A137.1 section 9.6 Procedure for Dynamic Coefficient of Friction (DCOF) of Common Hard Surface Floor Materials.

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The results of these tests were that of Tropical Forest Products decking products in wet conditions:

- Average Static Coefficient of Friction Wet: .73 (High Traction)
- Average Dynamic Coefficient of Friction Wet: .45 (High Traction)

## Smooth Versus Grooved Deck Surfaces

The question is frequently asked. Are non-slip grooved wood surfaces less slippery than smooth wood surfaces? While visually, a grooved surface would appear to be more slip-resistant than a smooth surface, in fact, a grooved wood surface is less slip-resistant than a smooth wood surface because a grooved surface creates less surface contact with the sole of the shoe.

This was recently reconfirmed by testing performed by a world-famous theme park that undertook their own testing comparing smooth versus grooved decking for their bridge deck applications.

It should also be noted that grooved surfaces are prone to collecting dirt, food, and other organic materials, which, combined with water and heat, serve as a food source for fungus growth, further reducing the coefficient of friction. As such, it is important to keep any walking surface clean.

Non-slip granular surfaces like those of anti-slip strips increase friction by creating a surface that penetrates or cuts into the shoe's sole, which increases friction. Additional slip resistance can be achieved by applying these types of products.

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Note\* Compliance with the minimum coefficient of friction requirements does not eliminate the potential for slipping. The volume of shoe contact with the floor surface, the material of the shoe sole and its degree of wear, the physical and mental condition of the individual at the time of a slip, whether the floor is flat or inclined, and how the surface is used, how drainage takes place if liquids are involved, all impact slip-resistance. It is the responsibility of the designer to determine the appropriateness of surface material for any given application.