

# Forbo Flooring Statement on Slip Resistance Testing

## Introduction

When considering slip risk there are many factors that can cause slips, trips and falls. These include: methods of cleaning, flooring type, footwear, levels of lighting, contrast between floors, walls and doors, and obstructions or other trip hazards. When assessing slip risk, the HSE recommends a hierarchy of control measures. These are:

- 1: Prevent contamination getting on to floor.
- 2: Control and contain contamination.
- 3: Eliminate adverse environmental conditions.
- 4: Improve floor conditions.
- 5: Put in footwear controls.

[http://www.hse.gov.uk/slips/step/general/Intermediate/11167CED-8DD4-4535-99BE-D857B67DA7EE/HSLCourseTemplate/7/slidetype2\\_102675.htm](http://www.hse.gov.uk/slips/step/general/Intermediate/11167CED-8DD4-4535-99BE-D857B67DA7EE/HSLCourseTemplate/7/slidetype2_102675.htm)

The practical measures than can be taken to reduce slip risk will vary in different situations, for example; installing effective entrance systems to prevent contamination getting onto the floor, having control measures in place to manage occasional spillages, and carrying out wet cleaning when the space is unoccupied will reduce the risk to both workers and non-employees.

Other measures may be more targeted, for example the use of an appropriate grade of slip resistant floor covering (safety floor) where continuous contamination is expected, such as oil and grease in commercial kitchens or lying water in washrooms, and, cannot be controlled by cleaning alone. In such cases it is of vital importance that the slip resistance properties of the selected floor covering are sustainable throughout the guaranteed life of the product.

A clear understanding of flooring test methods and results, and what they mean in terms of contributing to the prevention of slips and trips is, therefore, an important factor in the flooring selection process.

"Floors with a coefficient of friction (CoF) of 0.36 and above are regarded as safe to walk on for most of the working population. Clean dry floors generally have a CoF greater than 0.36.

Employers should have a safety management system with controls in place to ensure that floors remain clean and dry as far as reasonably practicable. The system should include procedures for dealing rapidly with occasional spillages. However, where floors are going to become foreseeably contaminated, AND it is not reasonably practicable to keep them dry, a floor should be provided with a CoF of 0.36 or above in the contaminated state." \*

\*Controlling slips and trips risks at work – speakers pack

<http://www.hse.gov.uk/slips/presentations.htm>

In assessing the slip resistance of floor surfaces the HSE use the Pendulum test to obtain a Pendulum test value which in turn can be related to the CoF and therefore slip potential. So, a PTV of 36 relates to a CoF of 0.36. Pendulum Test values are used to provide a measure of slip risk.

UK Slip Resistance Group and HSE Guidelines on interpretation of results:

	<b>PTV*</b>
High Slip Potential	0 - 24
Moderate Slip Potential	24 - 35
Low Slip Potential	36+

## **Forbo Step Safety Vinyl – sustainable performance safety floor products**

Forbo Flooring manufactures a wide range of resilient floor coverings suitable for use in many varied locations.

Whilst there is no formal definition of a safety floor, it has been widely accepted by the flooring industry for many years that safety floors are floor coverings that contain hard particles in the structure (not just on the surface) that provide enhanced slip resistance properties. It is the presence of these particles that provide the enhanced slip resistance properties required for floor coverings required in areas that are subject to contaminants (on an ongoing basis) that could present an increased risk of slipping for pedestrian users.

Most importantly, as the product wears in use, new particles within the structure are exposed ensuring that the **slip resistance of the floor covering is maintained throughout its service life – providing guaranteed sustainable slip resistance** (from the first to the last day of use).

In 2005 a new product standard BS EN13845 was introduced for PVC floor coverings with particle enhanced slip resistance properties. This standard defined the slip resistance performance requirements for use in application areas subject to wet contamination (separate test methods are prescribed for areas subject to normal footwear (shod) and barefoot usage areas. The standard also contains an accelerated wear test with a minimum level of performance required in order to comply with the standard.

This standard was updated in 2017 and the Pendulum Test was added to the list of prescribed slip resistance test methods. Products may be classified by PTV for normal footwear use (class Esf) or for barefoot use (class Esb) or, where the application requires e.g. wet changing areas, both. The minimum required wet PTV for each performance classification is 36.

The Forbo Step safety vinyl range is manufactured to meet the requirements of EN13845:2017 for sustainable slip resistance, **guaranteeing that the product will perform consistently in relation to slip throughout its stated warranted lifetime**. Forbo Flooring holds independent Pendulum Test reports for all products within the Step range.

### **Pendulum Test values for non-safety flooring products?**

Correctly specified, installed and maintained smooth or embossed resilient floor coverings will provide a PTV in clean dry conditions higher than 36, and with the correct control measures in place to deal with occasional spillages, these floor coverings can provide a lifetime of safe use.

Whilst both Forbo and other manufacturers of smooth and surface embossed products may produce some floorings with high PTV's (in wet conditions) when tested at point of production (Ex- Factory), these products cannot be guaranteed to provide sustainable wet slip resistance performance over time as wet slip resistance values will fall in service due to, for example, the effects of traffic, cleaning methods.

Forbo Flooring does not automatically conduct Pendulum Tests on its range of smooth and surface embossed resilient sheet and tile products to assess wet performance, as these will not provide sustainable wet slip resistance throughout guarantee lifetimes.

### **What to do if other suppliers quote PTV values for non-safety flooring products?**

Forbo Flooring recommends any product selector to seek confirmation in writing from the manufacturer/supplier/distributor of such products to ensure *that the product performance is sustainable*. We recommend sensible caution in relation to exclusions in their technical specifications which say all measurements are 'ex-factory' in very small print.

Many of the Forbo smooth and surface embossed ranges achieve plus 36 PTV results in wet conditions but we consider this to be misleading and potentially dangerous to quote as they are not sustainable.

### **Will Forbo test a product for PTV value for a specific item of non-safety flooring?**

If clients insist, we can conduct internal indicative Pendulum Tests on individual products, but these are issued clearly with the statements above.

Forbo non-sustainable smooth and surface embossed flooring products will provide a low potential for slip in clean dry conditions and a moderate potential for slip in wet and contaminated conditions when tested with the Pendulum Test Method (Note: individual results will naturally show some variation between batches).

### **Forbo Flooring and UKSRG (UK Slip Resistance Group)**

As a long serving member of the UKSRG, Forbo Flooring is at the forefront of testing for slip resistance of flooring products.

The UKSRG provide the guidelines and methodology to conduct Pendulum Tests and Forbo Flooring is an active member on sub-committees and working groups.

Currently the UKSRG has put a notice on their website in relation to surface micro roughness testing following notification of significant variations in test results with updated test equipment:

#### **“Important update regarding Rz value to estimate slip resistance**

A presentation considering surface microroughness data was given at the Group meeting on 6th June 2019. The data presented suggests that 2 different machines, which appear to be measuring the same microroughness parameter, can give different results. At the subsequent meeting in

October, the largest supplier of measuring equipment, Taylor Hobson (Surtronic), provided more background information as to variations in results between machines and their decision to modify (as soon as commercially viable) the latest version to include both the historically based and new reading formats.

The Group reminds members, and other interested parties, that the roughness measurement should be considered as a complementary measurement to be used in conjunction with Pendulum Test values. Section 7 of the current Guidelines refers (Issue – 5 October 2016).

The work presented is ongoing and will be revisited at the next Group meeting in February 2020 when an update will be given.”

<https://ukslipresistance.org.uk>

### **Forbo Flooring and BS8300-2:2018**

Following queries over some aspects of this British Standard, Forbo Flooring has raised an official query with BSI to seek clarification of the meaning behind the paragraph from the BSI Committee responsible for the standard:

*“Floor surfaces need to be selected to ensure, as far as is possible, that traction beneath the foot can be maintained under normal conditions of use. This entails specifying materials that have an appropriate coefficient of friction, offering a surface that reduces the potential for slips whilst also allowing passage without undue effort due to levels of friction being too great.”*

This appears in Annex C C.1 Background of the standard. Whilst this Annex is ‘informative’ only, it needs clarification to ensure the actual intention of the words used is understood.

The current discussions with the BSI Knowledge Centre suggest that it refers to the expected normal state of any floor depending on the actual location/use. For example, a garage is likely to have regular contamination (grease/oil) requiring a safety type flooring. In contrast, the expected normal state of an internal corridor within a school/office/hospital would be dry. The term ‘a common-sense approach’ was used to arrive at an expected ‘normal condition of use’ during these discussions.

## **Forbo Flooring and British Standards/CFA (Contract Flooring Association)**

Forbo Flooring supports the CFA with representation on British Standards Committees for flooring (BS8203:2017 resilient and BS5325: 2021 textile) which ensures that any documentation or statements made by Forbo Flooring are in line with current guidelines, recommendations, and best practices within the flooring industry.



Craig Thornhill  
Technical Services Manager  
Forbo Flooring UK Limited

Further reading:

HSE Slips and Trips – <http://www.hse.gov.uk/slips/index.htm>

UK Slip Resistance Group – <https://ukslipresistance.org.uk>

CFA Guide to Contract Flooring – <https://cfa.org.uk/Contract-Flooring-Association-Information-and-Downloads/>

### **Additional help and information**

Telephone: **0800 121 4780** (office hours)

Email: [uktechnicalsupport@forbo.com](mailto:uktechnicalsupport@forbo.com)

**Forbo Flooring UK Limited**

Web: [www.forbo-flooring.co.uk](http://www.forbo-flooring.co.uk)