

Slip resistance matters and measures

The measure of a safe floor is defined as one where the vast majority of people (999,999 out of 1 million) can safely walk. In the 1950s the Building Research Establishment discovered the required friction between the floor and the shoe to create this level of safety. It was found that for straight walking a dynamic coefficient of friction of 0.36 was required, or if you included turning, etc., 0.40 was needed. Over the years, these figures have been confirmed by analysis of accidents on floors. Floors which produce less friction with the shoe heel than 0.4 will tend to have a record of slipping accidents. People rarely slip on floors which have a coefficient greater than 0.4. These values are used in publications such as BS 8204 (in-situ floors) and the UK Slip Resistance Group Guidelines.

Slip resistance and contaminated floors

For ideal safety, the floor should have a coefficient of friction greater than 0.4 in whatever state of contamination the floor is likely to be used. If a floor is always dry then it should be tested in the dry, but if there is a chance it could become wet, as many floors do, then it needs to be tested in wet conditions. A few drops of water are all that is required to cause water induced or lubricated slip.

Wet Floors

In some situations the floor can be expected to be wet e.g. swimming pools, changing rooms etc. and the measure of slip resistance in the wet is most important. In other situations where we try to keep the floor dry, we should still measure slip resistance in the wet if there is a possibility of water based spills, e.g. restaurants, kitchens, coffee shops.

Measuring slip resistance in the wet

Measuring the dynamic coefficient of friction in the wet is technically challenging. There are only two machines which accurately reflect the lubricating effect of water on the floor as experienced by a person's heel slipping over the floor. If the machine does not reflect that effect correctly then it will give the wrong answer in wet conditions.

A note on roughness

Some authorities suggest the use of roughness to assess the slip resistance of floors. An extensive study of roughness and slip resistance using 300+ floor surfaces found poor correlation between the two. Slip resistance cannot be estimated with any reliability from roughness readings alone. This warning is reiterated in the UK Slip Resistance Group Guidelines.

Accurate Testing of Slip Resistance

The two machines which accurately assess slip resistance are the TRL Pendulum as described in BS 7976, and SlipAlert. The Pendulum is used throughout the world and regarded by many as the definitive measure of slip resistance. However, it is cumbersome and heavy. It takes time to set up and use and requires a skilled operator to ensure it gives the correct answer.

SlipAlert was designed specifically to correlate with the Pendulum and is much lighter, quicker and very simple to use. It is recognised by bodies such as the HSE and the UK Slip Resistance Group and is increasingly used by flooring contractors, cleaners, building owners and local authorities. Further details can be found on www.slipalert.com.

About the author

The author, Malcolm Bailey, is Secretary of the UK Slip Resistance Group and has been investigating slipping accidents for over 25 years. He is Chairman of both the UK and European Standards Committees which are concerned with slip resistance measurement. He is also Chairman of the BS 8204 (In-situ flooring) Committee and one of the two recognised FeRFA consultants.