

Slip Resistance 1

General

Dennis Ruabon Tiles is actively involved in the development of slip resistance testing methodology and is the UK manufacturing representative on the EC Consortium Sixth Framework programme, SlipStd, which is committed to development of slip resistant standard surfaces.

Slip resistance can be defined as:-

“The propensity of a flooring surface in combination with the foot and the surface conditions to resist the foot from sliding”.



The slip potential of flooring can be influenced by many factors. The main considerations are:

- The nature of the footwear, for example whether rubber, leather or synthetic soled and, if applicable, whether intended for barefoot use.
- Whether the floor is wet or dry and the expected service conditions in use.
- Whether the floor is clean or dirty and if dirty, the nature of the contaminant.
- The speed at which a person is walking or running.
- The texture of the flooring material.
- Gradients and ramps and whether ascending or descending.

Consideration should be given at the design stage to the most arduous and demanding conditions likely to arise. It is also critical that a suitable cleaning regime is specified to ensure the tiled surface is maintained in optimum condition, free from any adverse contamination.

Standards and testing

The governing standard for ceramic floor tiles, BS EN 14411:2006 allows manufacturers to declare slip resistance values by any of four current European test methods. The absence of a single harmonised test method can therefore prove confusing when specifying tiles for a particular application.

Extensive research has been carried out in the UK by The Health & Safety Executive in conjunction with The UK Slip Resistance Group and British Standards. The preferred test methods and classification systems are based on coefficient of friction testing using the pendulum tester and surface microroughness meter.

Other accredited European test methods include the German Ramp tests DIN 51130 and DIN 51097 and the Sled Type Tortus test favoured in Italy.

Pendulum Testing

Also known as the British pendulum, portable skid resistance tester and TRRL pendulum it is designed to simulate the action of a slipping foot. Based on a simulated swinging heel which sweeps over a set area of flooring in a controlled manner, the slipperiness of the flooring has a direct and measurable effect on the pendulum test value (PTV) given (previously known as SRV).

The pendulum tester has advantages in that it can give reliable results in both wet and dry conditions and its portability means it can be used on site as well as in the laboratory. Research has confirmed the pendulum to be a reliable and accurate test, leading to its adoption as the standard HSE test method.



Surface microroughness

An indication of slipperiness in water-contaminated conditions may be simply obtained by measuring the surface roughness of tile surfaces. Research has shown that measurement of the Rz parameter allows slipperiness to be predicted for a range of materials. Rz is a measurement of total surface roughness, calculated as a mean of several peak-to-valley readings.

Ramp Test

DIN 51130 and DIN 51097 describe the German ramp tests used for shod and barefoot testing respectively. These tests involve a subject walking back and forth on a contaminated test panel. The inclination of the sample is gradually increased until the test subject slips. The average angle at which slip occurs is compared to a classification range known as ‘R’ ratings. HSE has reservations about this method as motor oil and safety boots are used for DIN 51330 which may not be typical of the actual intended use of the tiles.

There is also some concern over the ‘R’ rating system as there is a misconception that the ‘R’ scale runs from R1 to R13 where R1 is most slippery. In reality the scale runs from R9 to R13.



DIN ramp test

Tortus Test

A ‘sled type’ tester which powers itself across the surface measuring coefficient of friction (CoF) as it goes. UK research has shown this to give misleading results in wet conditions, even showing smooth floors to be less slippery when wet.

