



Getting The Most Out Of Slip Testing



The Law

There is no express requirement for a value from a particular test method to be achieved in UK law. It is however a clear requirement that floor surfaces must not present a risk to health or safety. The BS 7976 Pendulum is the preferred test method of the UK Regulator (the HSE) and values of 36 or greater are classified as presenting a 'low risk of slip'. In every legal case that we have been involved in, it has been the ≥ 36 PTV "low risk of slip" classification which has been of interest in determining whether a floor surface is safe or slippery.

Slip risk is referenced directly in The Workplace Health Safety and Welfare Regulations 1992, and more generally in The Management of Health and Safety at Work Regulations 1999 and The Health and Safety at Work Act 1974. For civil (compensation) cases it is typical that the courts will regard breaches of health and safety regulations as evidence of negligence.



The 'Right' Test Method

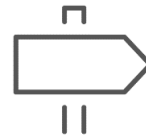
A bewildering range of slip tests exist. To gain meaningful information about the slip resistance of a floor surface you must have an accurate and reliable test replicating end use conditions.

Method	Condition	Rating
BS 7976 'Pendulum'	Shod/barefoot in dry/water wet	PTV
BS EN 13036 'Pendulum'	Shod in water wet	PTV
DIN 51130 'Ramp'	Safety boots in motor oil	R9-R13
DIN 51097 'Ramp'	Barefoot in soap solution	A, B or C

Grip Potential recommend, and exclusively conduct, BS 7976 Pendulum slip testing as a basis for any slip risk assessment.

"HSL research has confirmed the [BS 7976] pendulum to be a reliable and accurate test, leading to its adoption as the standard HSE test method for the assessment of floor slipperiness in dry and contaminated conditions" – The Assessment of Pedestrian Slip Risk, The HSE Approach.

"The revisions included in Issues 5 of the UKSRG Guidelines aim to improve the repeatability and reproducibility of the UKSRG's favoured test method; the [BS 7976] Pendulum test" – UKSRG Guidelines v5.



Assessment Locations

No floor surface should be slippery, but budgets don't always allow for assessment of a property or estate in its entirety. In this instance it is of greater value to address high risk surfaces first, both in terms of reducing the risk of a slip and providing evidence to defend a slip claim. Slips typically occur on contaminated surfaces, particularly where the surface has not been designed to provide safe wet grip, or has not been maintained in a safe/clean condition. Clean and dry surfaces rarely present a slip risk, but it can still be useful to assess these in some instances, confirming the surface is safe and providing means to effectively defend spurious slip claims.

We would recommend targeting, in order of priority;

1. Accident hot spots, regardless of end use conditions (staff can often highlight these areas effectively).
2. Surfaces which are routinely wet in end use, e.g. wet leisure environments, toilets, kitchens, external surfaces.
3. Surfaces which are at risk of getting wet in end use, e.g. entrances, eating/drinking areas, routes to/from contaminated areas.
4. Surfaces reliably maintained in a clean and dry condition in end use



Determining Test Requirements

The Pendulum measures slip resistance at a single small point (approx 0.01m²) so a single measurement is not necessarily representative of a large floor surface. BS 7976 guidance on sampling is extremely vague, and the HSE and UKSRG offer no guidance on sampling. At Grip Potential, we take a pragmatic approach based on extensive slip test experience;

- For small areas (<100m²) we recommend a single full* test, supported by a visual/tactile inspection of the floor by an experienced expert to provide comment on likely variability.
- For large areas (>100m²) we recommend a single full test and two indicative* tests, thereby documenting variability of the surface in three directions and at three locations. Where results produced are similar, the surface has been effectively benchmarked with the minimum of testing (and expenditure). Where results are variable, or close to the cut off for a 'low risk of slip' classification, further testing



can be useful to determine more precisely the extent of variability and its impact on slip risk.

- For limited budgets, we recommend indicative testing on a larger number of floors rather than full testing of a smaller number. This approach will maximise useful information, and so maximise the reduction in slip risk, for any given expenditure. Results are suitable to inform any necessary improvement works, and give an indication of the likely outcome of any accident investigation test in the event of a claim, but do not address directionality with test results, relying instead on expert visual/tactile inspection.

In our opinion these present the absolute minimum of useful sample rates. We are aware of competitors offering significantly reduced sampling, or partial tests, to cut costs. Reducing sampling further makes data meaningless and/or misleading, returning a value unlikely to be representative of the performance of the surface, and of no use in court. This may also create a situation in which a dangerous floor is assumed safe, causing a relax in controls, making slip accidents much more likely.

*A 'full test' comprises 48x Pendulum measurements, across 3x directions and 2x conditions (wet and dry) with 1x slider (shod or barefoot), as per BS 7976. An 'indicative test' comprises 16x measurements across 1x direction and 2x conditions (wet and dry) with 1x slider (shod or barefoot). Both include Rz surface roughness measurement, and a full risk assessment in line with UKSRG/HSE Guidance.



Slider Choice

The Pendulum operates with two distinct rubber sliders (the 'sole' on the test foot), representing two distinct types of pedestrian;

- Slider #96, or 4S rubber, representative of pedestrians wearing footwear.
- Slider #55, or TRL rubber, representative of barefoot pedestrians.

Slider choice should be based on traffic type, such that #96/4S is most commonly used and #55/TRL is used in wet leisure and/or bath/shower environments. In some cases, dual use is expected (changing rooms) and both sliders should be used (2x tests) to cover both traffic types.

For heavily profiled finishes the deformation of footwear can prove crucial to slip resistance. Use of both sliders can provide meaningful information in this instance, demonstrating the range of performance expected on the surface.



Test Conditions

Given that slip risk in real, daily, end use condition is the central focus of a slip risk assessment, we will typically assess

surfaces in the 'as found' condition. In some cases, it may be useful to conduct testing before and after cleaning, demonstrating the difference various cleaning methods make to slip resistance. Cleaning should be conducted by your in-house cleaning team in this instance. Whilst we can and do conduct spot cleaning of surfaces as required, we use our own method and product, and focus on a tiny area, producing a result that may be unsustainable in a commercial setting and so not representative of true end use conditions.

The BS 7976 standard calls for dry and water wet test conditions, but different contaminants are relevant in some environments. Test conditions should reflect end use conditions if possible, so wherever it will produce meaningful data we will be happy to test with the contaminants found in your environment.



Findings, Improvements & Reassessment

Preliminary assessment results can be discussed in real time as the tests are

completed, a formal test certificate is issued before leaving site, and a full risk assessment report is issued within 5 working days of the assessment.

Where surfaces are not compliant we can provide independent and impartial advice on any improvement works necessary. We recommend that retesting/certification of any cleaned/treated/replaced surface is then conducted to document its compliance.

Where surfaces are compliant, an ongoing monitoring plan is necessary if slip resistance is to be evidenced in the long term. As slip resistance changes over time with the effects of contamination, cleaning and wear, it is not sufficient to certify a surface once. We will typically recommend reassessment on an annual basis, with a reduction in the intervening period where surfaces lie close to the cut off for a 'low risk of slip', or where surfaces are likely to change more quickly than usual.

Accident investigation tests are typically conducted up to three years after the event, so a record of ongoing compliance (annual assessments showing values of ≥ 36 PTV in conditions of end use) from an independent expert is likely to carry greater weight in court than any subsequent investigative testing.