Designing for Long-Term Safety & Performance

A Guide to Slip Resistance in Interior Flooring

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Introduction

Interior flooring is a critical element in the built environment, with direct implications for occupant safety, compliance and long-term performance. In spaces such as healthcare facilities, aged-care residences and high-traffic commercial buildings, slip resistance is not merely a desirable attribute but a fundamental safety requirement.

Despite its importance, slip resistance remains one of the more misunderstood aspects of flooring specification. The performance of a surface is not static; it evolves with wear, cleaning methods and environmental conditions. A surface that meets compliance \guidelines when newly installed may degrade to unsafe levels if maintenance regimes or surface treatments are not properly considered. Architects and specifiers therefore need to look beyond initial product claims, examining the interplay between flooring type, footwear use, traffic patterns and lifecycle maintenance.

This paper sets out to clarify the technical parameters that define slip resistance in interior flooring, addressing common misconceptions and outlining strategies for informed specification. By positioning slip resistance within a broader, long-term design strategy, this paper provides practitioners with guidance that enhances project and compliance outcomes.

Regulatory context

Slip resistance refers to the ability of a floor surface to reduce the likelihood of slipping under expected conditions of use. It is a performance measure that considers how surfaces interact with factors such as footwear, contaminants and pedestrian movement. In architectural specification, it is critical to space functionality and is mandated in certain applications.

Slip resistance in Australia is governed primarily by **AS 4586**, which outlines the recognised test methods and associated classifications. These include the pendulum (P) ratings, oil-wet ramp (R) ratings and barefoot ramp (A/B/C) ratings.

The **National Construction Code (NCC)** mandates compliance with slip resistance requirements for several defined circumstances, most notably for stairs, ramps and adult change facilities. Beyond these mandatory provisions, additional guidance is provided through **Handbook 198** (Guide to the specification and testing of slip resistance of pedestrian surfaces) and **Handbook 197** (An introductory guide to the slip resistance of pedestrian surface materials). Both handbooks are advisory in nature and do not carry the same regulatory force as the NCC, but are referred to when slip resistance of a surface is required.

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Addressing common misconceptions

Slip rating varies across applications

A recurring misconception among practitioners is the assumption that a single slip resistance rating is adequate across all applications. In reality, slip risk varies substantially between settings such as wet rooms, kitchens, corridors and building entries. Applying one uniform rating overlooks critical variables including usage patterns, contamination risks and occupant profiles.

Wet and dry performance differs

Another area of confusion arises from the distinction between wet and dry testing conditions. Products achieving compliance under dry testing regimes may not maintain adequate performance in environments subject to water, grease or spills. Similarly, failure to account for barefoot use introduces risk.

To illustrate this, consider that P ratings, which are determined with a rubber Slider 96 intended to simulate shod feet, would not be appropriate for barefoot environments such as showers, change rooms or pool surrounds. In these contexts, A/B/C classifications under AS 4586 Appendix C or AS 4586 Appendix A pendulum testing using a Slider 55 provide a more accurate assessment of barefoot slip dynamics.

Initial compliance vs. long-term performance

A further misconception is the belief that achieving initial compliance guarantees long-term safety. In practice, slip resistance deteriorates over time due to wear, cleaning practices and surface treatments. Without accelerated wear testing, specifiers cannot reliably predict how a surface will perform years after installation.

Currently, no standardised published test method exists to assess long-term slip performance, underscoring the importance of risk-based specification, ongoing monitoring and alignment with maintenance regimes.

Table 1. Slip resistance test methods and their applications

Test Method (AS 4586 Appendix)	Classification	Description	Typical Application
Appendix A – Wet Pendulum Test	P0–P5 (Pendulum ratings)	Uses a swinging arm (pendulum) with a rubber slider to measure dynamic friction on a wet surface. Slider 96 = shod feet; Slider 55 = barefoot use.	Most widely applied in Australia. Suitable for general pedestrian areas, including entries, corridors, ramps, stairs and wet zones.
Appendix B – Dry Floor Friction Test	Coefficient of Friction (COF ≥0.40)	A drag sled with a rubber slider is pulled across a dry surface to determine static friction.	Applicable to dry, level surfaces.
Appendix C – Wet Barefoot Inclining Platform Test	A, B, C (Barefoot ratings)	Human test subjects walk barefoot on a soapy wet ramp that is gradually inclined until slip occurs.	Barefoot wet areas such as swimming pools, showers and change rooms.
Appendix D – Oil-Wet Inclining Platform Test	R9–R13 (Ramp ratings)	Human test subjects walk with shoes on an oil-coated ramp that is gradually inclined until slip occurs.	Commercial kitchens, food preparation zones, industrial workplaces with oil/grease contamination.

Designing for long-term performance: Key considerations

Real-world risk factors

The specification of flooring for slip resistance must account for the conditions in which the surface will perform. Space function is a critical variable: wet zones such as bathrooms, kitchens and building entryways demand higher slip resistance due to frequent exposure to moisture, while dry areas like hallways or offices may require lower classifications but still warrant careful consideration of foot traffic intensity and movement patterns.

Occupant profile further influences design decisions. Children, aged-care residents and individuals with mobility impairments face elevated risk of falls due to reduced stability and slower recovery from slips.

As noted earlier, in barefoot areas, slip resistance must be evaluated under specific classifications that differ from shod-foot ratings. Similarly, the type and frequency of contaminants play a decisive role. A surface exposed to oil or grease requires a significantly higher slip resistance than one subject only to clean water or dust.

Material performance over time

Long-term safety also depends on how flooring materials interact with cleaning and maintenance regimes, as well as how they respond to everyday wear. Aggressive or incompatible cleaning agents can strip protective finishes or diminish the effectiveness of slip-resistant coatings. Conversely, inadequate cleaning allows contaminants to accumulate, undermining even high-performing products.

Surface-applied treatments often provide only short-term resistance, while materials incorporating aggregates within their structure generally retain slip-resistant properties over longer periods. However, real-world wear factors, such as heavy foot traffic, furniture movement, abrasive dirt carried in from outdoors and exposure to moisture or chemicals, can accelerate surface degradation.

Limitations of standard testing

A key challenge in specification lies in the limitations of current testing frameworks. AS 4586 provides methods for determining slip resistance at installation, but it does not assess performance across the service life of the flooring. Consequently, specifiers relying solely on initial compliance data risk overlooking long-term safety.

While there is no recognised standard for accelerated wear testing, any attempt to simulate accelerated wear testing offers valuable predictive insights into how products may perform under frequent use. Incorporating such data into specifications promotes better whole-of-life outcomes for building owners and occupants.

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Best practices for slip resistance specification

To ensure flooring delivers safe, compliant and durable slip resistance across its lifecycle, specifiers should adopt a performance-based approach guided by the following best practices:

1. Align ratings with site conditions, use and context

- Match slip resistance classifications to the specific use case (e.g., wet areas, circulation zones, barefoot areas).
- Consider user behaviour and profile (children, older adults and mobility-impaired occupants require more conservative safety margins).
- Assess contamination risks (e.g. presence of oil, grease and use of detergents).

2. Address cleaning and maintenance protocols

- Verify which cleaning agents are compatible with the flooring finish and document these in the maintenance manual.
- Ensure cleaning schedules are risk-appropriate (e.g., daily cleaning in kitchens, targeted cleaning in wet areas).

3. Evaluate long-term performance and durability

- Evaluate products based on durability and in-use performance, not just test compliance.
- As slip resistance degrades under actual use, require evidence of accelerated wear testing or long-term performance data where slip resistance is critical.

4. Incorporate lifecycle considerations

- Select materials with integrated slip-resistant properties (e.g., aggregates within the surface) rather than short-lived surface coatings.
- Specify periodic in-use slip testing in high-risk zones to monitor and address declining performance.
- Balance safety with sustainability by selecting solutions that minimise environmental impact while delivering durable, compliant slip resistance.

Ensuring long-term safety and performance with Polyflor

Slip resistance is not a static property but a performance measure that must be sustained throughout the service life of a floor. **Polyflor**, the industry leader in high-quality vinyl flooring, addresses this challenge with the comprehensive Polysafe range of slip-resistant flooring systems designed specifically for high-risk environments such as healthcare, aged care and manufacturing and hospitality. Each Polysafe product is engineered with embedded aggregates, providing a permanent slip-resistant surface that does not depend on applied coatings, which can wear away under normal use.

To validate its performance over time, Polyflor conducts internal accelerated wear testing, simulating the impact of a million footsteps and replicating the stresses encountered in real-world environments. Safety floors are designed to retain their AS 4586 wet pendulum classification over time. Polyflor supplements this with wear simulations and in-use performance testing, offering specifiers confidence that slip ratings are retained even under conditions of heavy wear.

Alongside performance, Polysafe products are developed to support both aesthetic and technical requirements of public and commercial interiors. The Polysafe range balances design flexibility with compliance, enabling architects to specify surfaces that contribute to the intended character of a space without compromising safety. Comprehensive technical documentation and tailored maintenance guidance further ensure that slip resistance is preserved over time.

Polyflor also aligns its safety flooring solutions with broader sustainability and compliance frameworks, including contributions to Green Star targets. Specifiers are supported not only at the point of design but throughout the product lifecycle, with access to performance data, installation expertise and post-occupancy service. This integrated approach ensures that flooring continues to deliver value long after installation.

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