Specific Accreditation Criteria

ISO/IEC 17025 Application Document

Infrastructure and Asset Integrity - Annex

Surface friction testing

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Purpose

This document provides interpretative criteria and recommendations for the application of ISO/IEC 17025 for both applicant and accredited facilities conducting surface friction testing, also known as ‘slip resistance testing’ or ‘slip testing’.

Facilities must comply with all relevant documents in the NATA Accreditation Criteria (NAC) package for Infrastructure and Asset Integrity — refer to *NATA Procedures for Accreditation.*

The clause numbers in this document follow those of ISO/IEC 17025; however, as not all clauses require interpretation, the numbering may not be consecutive.

5 Structural requirements

5.4 Slip testing is sometimes coordinated across a geographically dispersed area, where technicians are individually responsible for their equipment and testing activities. Accredited facilities must ensure that key testing personnel are made available during NATA assessments. Where NATA is unable to evaluate the effectiveness of technical control solely from an assessment of the base facility, further assessments may be required at these other locations.

5.5 The facility shall identify the individual(s) responsible for technical control of testing activities.

6 Resource requirements

6.2 Personnel

6.2.3 Slip testing may be carried out in the field, typically without direct supervision by personnel responsible for technical control. For testing conducted away from the base site, accredited facilities are responsible for monitoring the implementation of their procedures and policies. Such monitoring may include:

- review of work instructions issued to field technicians;
- availability of relevant test standards and specifications;
- suitability and condition of test equipment;
- observation of test setup and performance;
- review of test records generated on-site, e.g. worksheets and reports.

6.2.6 Testing personnel shall not work unsupervised and/or authorise the release of test results without being authorised by the individual(s) responsible for technical control.

6.4 Equipment

6.4.4 The specified mass and dimensions of rubber sliders must be verified using calibrated equipment.

6.4.7 Facilities must ensure that where equipment calibration and checking intervals are included in standard methods or specifications, these intervals are followed.

Dry floor friction tester

Facilities must establish metrological traceability of the measurement results obtained by dry floor friction testers. This can be achieved by using a calibration provider accredited by NATA, a provider accredited by a signatory to the ILAC Mutual Recognition Arrangement, or by other means. Refer to the NATA publication *General Accreditation Criteria: Metrological Traceability Policy*.

Critical components of the calibration include the slider mass and dimensions, the speed of the device, and the internal load cell.

The calibration report or certificate must demonstrate that the device fulfils the equipment specifications as outlined in the applicable standard test method(s). Calibration certificates provided by the manufacturer or distributor are not considered to be valid unless they have been endorsed by an accredited facility.

Note: A publicly available standard method for calibrating dry floor friction testers has not yet been developed or published.

Note: Dry floor friction testers may include a built-in 'calibration' function, but this use of the term describes an equipment check or verification activity as per ISO/IEC 17025 clauses 6.4.4 and 6.4.10.

Pendulum friction tester

Facilities must establish metrological traceability of the measurement results obtained by pendulum friction testers. This can be achieved by using a calibration provider accredited by NATA, a provider accredited by a signatory to the ILAC Mutual Recognition Arrangement, or by other means. Refer to the NATA publication *General Accreditation Criteria: Metrological Traceability Policy*.

Pendulum friction testers used for testing in accordance with AS 4663 or AS 4586 shall be calibrated in accordance with EN 16165.

Calibration includes establishing the geometry of the tester, the mass of the pendulum arm and pointer, and spring tension.

Where control specimens are used as part of a quality assurance program, their assigned values shall be verified after the pendulum is calibrated.

Note: EN 16165 superseded CEN/TS 16165 in July 2021.

Note: BS 7976-3 was withdrawn in February 2022 and superseded by BS EN 16165.

6.4.10 Rubber sliders are consumables and are subject to deterioration over time. Facilities shall document their procedure and acceptance criteria for ensuring the integrity of rubber sliders. For example,

- defining storage conditions;
- periodically monitoring changes in hardness;
- implementing a technically justified periodic replacement policy.

Rubber sliders shall not be used beyond the supplier's stated expiry date, unless it can be demonstrated that they comply with specified hardness, dimensions, and mass.

Where control specimens are used for verification checks, facilities shall have a documented procedure that includes acceptance criteria, frequency of checks, and how assigned values are established.

Note: EN 16165 includes guidance for verification checks against control specimens.

6.4.13 Technical records shall be maintained for surface conditioning materials used by the facility, e.g. P400 abrasive paper, lapping film. Records must also include the test results (i.e. slip resistance readings) generated by the conditioning of rubber sliders.

6.5 Metrological traceability

6.5.1 Where there are specified parameters for the material properties of rubber sliders (e.g. IRHD and/or Shore hardness, rebound resilience), these values must be metrologically traceable.

7 Process requirements

7.2 Selection, verification and validation of methods

7.2.1.1 If a surface is to be tested in-situ, it shall be tested in accordance with AS 4663 unless it has been established that there has been no pedestrian traffic other than those who installed the surface and those who undertook formal testing.

In the context of AS 4586 for new pedestrian surfaces, activities such as cleaning, pressure washing, and mechanical scrubbing are not considered treatments for improving the slip resistance of existing surfaces.

Only treatments involving the application of a coating or other process which physically transforms the surface (e.g. etching, sandblasting, paint, grooving) can be regarded as converting an ‘existing’ surface to a ‘new’ surface for the purposes of testing and classification.

Note: Further information may be found in AS/NZS 3661.2.

7.2.1.3 When slip testing is performed in the field, facilities must document their process and criteria for choosing test locations to ensure consistent application of test methods.

Such criteria must include consideration of the nature and purpose of the test, traffic type and volume, surface finish, variations in workmanship, sampling bias, and any other technically relevant factors.

7.2.2.1 Laboratory-developed test methods (‘in-house’ methods) for accelerated wear testing shall be suitably validated.

Validation shall consider performance characteristics of the method and its relevance to the needs of a given application.

For example, where the intended application is to estimate anticipated changes in slip resistance of a flooring surface (i.e. simulation of in-service conditions), validation will necessarily include a correlation between simulated wear and in-service performance.

Note: Performance characteristics can include, but are not limited to, measurement range; accuracy; measurement uncertainty of the results; limit of detection; limit of quantification; selectivity of the method; linearity; repeatability or reproducibility; robustness; bias.

7.6 Evaluation of measurement uncertainty

7.6.3 Unless the test method includes precision and bias statements and/or includes specific information regarding measurement uncertainty, facilities must estimate measurement uncertainty.

Contributions to measurement uncertainty for slip testing include, but are not limited to:

- drift of calibration results between calibrations;
- known uncertainty value(s) of the test equipment, i.e. as stated on the calibration certificate;
- resolution, e.g. analog scale used by pendulum testers;
- repeatability.

Where facilities are responsible for sampling, they must also estimate uncertainty arising from sampling.

Note: AS 4586 and AS 4663 do not fulfil the criteria outlined in NOTE 1 of ISO/IEC 17025 clause 7.6.3.

7.8 Reporting of results

7.8.1.2 NATA endorsed test reports may constitute evidence in legal proceedings, so it is important that they are not prone to misinterpretation.

Under accreditation to ISO/IEC 17025, test results from AS 4663 (existing pedestrian surfaces) cannot be used as a basis for stating the ‘likely’ or ‘equivalent’ surface classification as per AS 4586 (new pedestrian surfaces).

Such statements are particularly problematic because legal arguments may be formed as to whether a surface is considered new or existing, i.e. whether a surface complied at the time of construction.

Note: Significant changes in slip resistance may occur during the installation of some materials or upon exposure to traffic. There is a risk that an inappropriate surface classification may incorrectly imply that a supplied product is not compliant.

Both AS 4586 and AS 4663 clearly define the difference between new and existing surfaces: “*A new pedestrian surface is considered to become an existing pedestrian surface once it has been installed and made available for pedestrian traffic, other than movements specifically for purposes of formal testing to determine compliance with AS 4586. New pedestrian surfaces are to be tested in accordance with AS 4586.*”

7.8.2.1 Where required or appropriate, reports must describe the nature and purpose of the testing conducted, e.g. periodic monitoring, occupational health and safety audits, contractual requirements, defect investigations, legal proceedings, etc.

7.8.7.2 While the possibility of further interpretation regarding the application of slip testing results are described in SA HB 198, this guide makes clear that any interpretations “…*would be subjected to qualification, and should only be on the advice of an expert, experienced in recognising wear, traffic and surface cleanliness and their effects on slip resistance*.”

Accreditation for work involving professional judgment of this kind may be provided under the inspection standard ISO/IEC 17020, but any such interpretations in test reports are not covered by accreditation under ISO/IEC 17025.

References

This section lists publications referenced in this document. The year of publication is not included as it is expected that only current versions of the references shall be used.

Standards

AS 1141.42	*Methods for sampling and testing aggregates, Method 42: Pendulum friction test*
AS 4586	*Slip resistance classification of new pedestrian surface materials*
AS 4663	*Slip resistance measurement of existing pedestrian surfaces*
BS 7976-3	*Pendulum testers — Part 3: Method of calibration*
EN 16165	*Determination of slip resistance of pedestrian surfaces - Methods of evaluation*
ISO 48-2	*Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*
ISO 48-4	*Rubber, vulcanized or thermoplastic — Determination of hardness — Part 4: Indentation hardness by durometer method (Shore hardness)*
ISO 4662	*Rubber, vulcanized or thermoplastic — Determination of rebound resilience*
ISO/IEC 17020	*Conformity assessment — Requirements for the operation of various types of bodies performing inspection*
ISO/IEC 17025	*General requirements for the competence of testing and calibration laboratories*

NATA publications

NATA Accreditation Criteria package for Infrastructure and Asset Integrity

General Accreditation Criteria: Metrological Traceability Policy

Further reading

AS/NZS 3661.2	*Slip resistance of pedestrian surfaces - Part 2: Guide to the reduction of slip hazards*
SA HB 197	*An introductory guide to the slip resistance of pedestrian surface materials*
SA HB 198	*Guide to the specification and testing of slip resistance of pedestrian surfaces*

Amendment table

The table below provides a summary of changes made to the document with this issue.

Section or clause	Amendment
Whole document	First edition.