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**ROAD AND AIRFIELD SURFACE
CHARACTERISTICS - TEST METHODS - PART
4: METHOD FOR MEASUREMENT OF
SLIP/SKID RESISTANCE OF A SURFACE -
THE PENDULUM TEST**

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English version

Road and airfield surface characteristics - Test methods - Part 4:
Method for measurement of slip/skid resistance of a surface -
The pendulum test

Caractéristiques de surface des routes et aéroports -
Méthodes d'essai - Partie 4: Méthode de mesurage de
l'adhérence d'une surface: Essai au pendule

Oberflächeneigenschaften von Straßen und Flugplätzen -
Prüfverfahren - Teil 4: Verfahren zur Messung der
Griffigkeit von Oberflächen: Der Pendeltest

This European Standard was approved by CEN on 28 November 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document EN 13036-4:2003 has been prepared by Technical Committee CEN/TC 227 "Road materials", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2004, and conflicting national standards shall be withdrawn at the latest by February 2004.

This European Standard is one of a series of standards as listed below:

EN 13036-1, *Road and airfield surface characteristics — Test methods — Part 1: Measurement of pavement surface macrotexture depth using a volumetric patch technique.*

prEN 13036-2, *Road and airfield surface characteristics — Test methods — Part 2: Procedure for determination of skid resistance of a pavement surface.*

EN 13036-3, *Road and airfield surface characteristics — Test methods — Part 3: Measurement of pavement surface horizontal drainability.*

EN 13036-4, *Road and airfield surface characteristics — Test methods — Part 4: Method for measurement of slip/skid resistance of a surface — The pendulum test.*

prEN (WI 00227131)-5, *Road longitudinal evenness — Definition (and calculation methods) of the longitudinal evenness indices.*

prEN (WI 00227132)-6, *Road longitudinal evenness — Profilometric test methods.*

EN 13036-7, *Road and airfield surface characteristics — Test methods — Part 7: Irregularity measurement of pavement courses — the straightedge test.*

Annex A is normative. Annexes B, C and D are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard describes a method for determining the slip/skid resistance of a surface using a device which remains stationary at the test location. The slip/skid resistance is measured by means of a pendulum arm.

The method provides a measure of the slip/skid resistance properties of a surface either in the field or in the laboratory.

This method measures the slip/skid resistance of a small area of a surface (approximately 0,01 m²). This should be considered when deciding its applicability to a surface which may have non-homogeneous surface characteristics, e.g. containing ridges or grooves, or is rough textured (exceeding 1,2 mm patch test).

NOTE As the results from this test are taken at one small location, the results cannot be compared with results from devices e.g. mobile devices, that measure the skid resistance over a long length of a surface.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places, in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*.

ISO 7619, *Rubber — Determination of indentation hardness by means of pocket hardness meters*.

ISO 4662, *Rubber — Determination of rebound resilience of vulcanizates*.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1 slip/skid resistance

property of the trafficked surface which limits the relative movement between the contact patch of pedestrian footwear (slip) or a vehicle tyre (skid) and the surface

NOTE 1 Loss of slip/skid resistance leads to loss of control by the pedestrian/driver with consequent increase in the risk of falling/crashes.

NOTE 2 There are numerous factors which contribute to slip/skid resistance, including the tyre pressure, contact area, tread pattern and rubber composition of the tyre or sole; the alignment, texture and frictional characteristics of the surface; the vehicle speed; the weather conditions prior to testing, i.e. wet/dry.

NOTE 3 Slip/skid resistance is not a constant but varies with climate and traffic and the effect of these on the characteristics of the surface material itself.

3.2 friction

resistance to relative motion between two bodies in contact. The frictional force is the force acting tangentially in the contact area

3.3 Pendulum Test Value (PTV)

loss of energy as the standard rubber coated slider assembly slides across the test surface and provides a standardised value of slip/skid resistance

4 Safety

When carrying out the test in the field, the equipment and operator will form a stationary obstruction. Adequate safety measures shall be in place to maintain a safe working area in accordance with regulations.

5 Principle

The Pendulum Tester incorporates a spring loaded slider made of a standard rubber attached to the end of a pendulum. On releasing the pendulum from a horizontal position, the loss of energy as the slider assembly passes over the test surface is measured by the reduction in length of the upswing using a calibrated scale.

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