SLOVENSKI STANDARD
SIST-TS CEN/TS 15901-14:2016

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Značilnosti cestnih in letaliških površin - 14. del: Postopek določanja torne sposobnosti vozne površine z mehanizmom za kontroliran zdrs v vzdolžni smeri (LFCI): naprava ViaFriction (Road Analyser and Recorder of ViaTech AS)

Road and airfield surface characteristics - Part 14: Procedure for determining the skid resistance of a pavement surface using a device with longitudinal controlled slip (LFCN): ViaFriction (Road Analyser and Recorder of ViaTech AS)

Oberflächeneigenschaften von Straßen und Flugplätzen - Teil 14: Verfahren zur Bestimmung der Griffigkeit von Fahrbahndecken durch Verwendung eines Geräts mit geregeltem Schlupf in Längsrichtung (LFCN): Das ViaFriction-Messgerät (Road Analyser and Recorder of ViaTech AS)

Caractéristiques de surface des routes et aéroports - Partie 14 : Mode opératoire de détermination de l'adhérence d'un revêtement de chaussée à l'aide d'un dispositif à frottement longitudinal contrôlé (CFLRDK) : le ROAR (Analyseur de Route et Enregistreur du Norsemeter)

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ICS:

93.080.20	Materiali za gradnjo cest	Road construction materials
93.120	Gradnja letališč	Construction of airports

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This Technical Specification (CEN/TS) was approved by CEN on 3 December 2015 for provisional application.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (CEN/TS 15901-14:2016) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by DIN.

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1 Scope

This Technical Specification describes a method for determining the wet road skid resistance of a surface by measurement of the longitudinal friction coefficient LFCN. The described method is also used to determine the skid resistance on a surface covered by ice or snow.

The method provides friction coefficient measurements of the pavement by using an electrically braked test wheel.

ViaFriction can operate in the following modes:

— Fixed slip: The slip ratio is fixed. The slip ratio can be set to a value from 1 % to 75 %.

— Fixed slip speed: The slip speed is fixed. The slip speed has to be lower than the vehicle speed.

— Variable slip: The test wheel is braked from 0 % to 75 % slip ratio recording F 30, F 60 and the slip ratio/friction curve.

The test tyre is dragged over a pre-wetted pavement under controlled speed conditions while the test tyre is parallel to the direction of motion and perpendicular to the pavement. Skid resistance measurement on winter roads do not require pre-wetted pavement.

To determine the macrotexture of the pavement surface a laser system can be added. This system is placed in front of the towing vehicle in order to measure the macrotexture (mean profile depth — MPD) on dry pavements and on the same path as the skid resistance measurement is done. The standard for this measurement and the device is described in EN ISO 13473-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 13473-1, *Characterization of pavement texture by use of surface profiles — Part 1: Determination of Mean Profile Depth (ISO 13473-1)*

ISO 13473-2, *Characterization of pavement texture by use of surface profiles — Part 2: Terminology and basic requirements related to pavement texture profile analysis*

ASTM 1551, *Standard Specification for Special Purpose, Smooth–Tread Tire, Operated on Fixed Braking Slip Continuous Friction Measuring Equipment*

3 Terms and definitions

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

3.1
wet road skid resistance
property of a trafficked surface that limits relative movement between the surface and the part of a vehicle tyre in contact with the surface, when lubricated with a film of water

Note 1 to entry: Factors that contribute to skid resistance are tyre pressure, contact area, tread pattern and rubber composition: the alignment, texture, surface contamination and characteristics of the road surface, vehicle speed and weather conditions.

Note 2 to entry: The skid resistance of a surface in Europe varies seasonally. Generally, wet skid resistance is higher in winter as a result of the effects of wet detritus and the effects of frost and wear by tyres on microtexture and macrotexture. Wet skid resistance is lower in summer as a result of dry polishing by tyres in the presence of fine detritus.

Note 3 to entry: The change in skid resistance of a surface in service is affected by the volume of traffic and the composition of the traffic, i.e. cars, buses, commercial vehicles of different sizes, as the tyres of these vehicles polish and/or wear the surfacing material in different ways. The geometry of the road will affect the change in skid resistance. Generally, tyres polish less on straight roads than on bends.

Note 4 to entry: Where the surface contains aggregate with a coating of binders, e.g. bitumen, resin or Portland cement, the skid resistance can change as the coating is worn away by tyres.

3.2
dry road skid resistance
property of a trafficked surface that limits relative movement between the surface and the part of a vehicle tyre in contact with the surface. The contact is not lubricated with a film of water

3.3
skid resistance
characterisation of the friction of a road surface when measured in accordance with a standardised method

3.4
friction coefficient
μ
ratio between the horizontal force in the direction of the motion that can be activated between the test wheel and the wet pavement and the vertical wheel load accomplished under controlled slipping conditions

Note 1 to entry: The controlled slipping condition is achieved by an electrical brake system. If the vehicle is in motion, the test wheel slides or slips in the forward direction.

3.5
friction
resistance to relative motion between two bodies in contact, the frictional force being the force, acting tangentially in the contact area, which is measured by a friction-measuring device

3.6
slip ratio
slip speed divided by the vehicle speed

3.7
fixed slip speed
this is a fixed slip where the slip speed is configurable and independent of the vehicle speed. The vehicle speed has always to be higher than the configured fixed slip speed

3.8
F 30
friction value at 30 km/h slip speed

3.9
F 60
friction value at 60 km/h slip speed

3.10
LFCN
longitudinal friction coefficient measured with the ViaFriction

3.11
macrotexture
deviation of a pavement from a true planar pavement with characteristic dimensions along the pavement of 0,5 mm to 50 mm, corresponding to texture wavelengths with one-third-octave bands including the range 0,63 mm to 50 mm centre wavelengths

Note 1 to entry: Peak to peak amplitudes normally vary in the range 0,1 mm to 20 mm.

Note 2 to entry: Macrotexture is a major factor influencing skid resistance at high speeds but it also has an effect at low speeds.

3.12
Mean Profile Depth
MPD
descriptor of macrotexture, obtained from a texture profile measurement as defined in EN ISO 13473-1 and ISO 13473-2

3.13
calibration
periodic adjustment of the offset, the gain and the linearity of the output of a measurement method so that all the calibrated devices of a particular type deliver the same value within a known and accepted range of uncertainty, when measuring under identical conditions within given boundaries or parameters

3.14
retaliation friction devices
type of friction device fitted to vehicles

Note 1 to entry: When the vehicle brakes are used with full force for a short period, the speed change or deceleration is used to calculate the friction.

Note 2 to entry: This type of friction device is used on winter road surfaces covered with ice or snow.

3.15
braking force coefficient
ratio between the longitudinal frictional force and the load on the test wheel

Note 1 to entry: The test wheel mass which is without dimension.

3.16
vehicle speed
speed at which the device traverses the test surface

3.17
slip speed
relative speed between the test wheel and the pavement in the contact area

3.18
wheel path
part of the pavement where the majority of the vehicle wheel passes are concentrated

Note 1 to entry: The wheel path is not a fixed location on a pavement surface. On a worn pavement, the wheel path can usually be identified easily visually. On a new laid surface, the position of the wheel path needs to be estimated by experienced operators.

Note 2 to entry: For special circumstances such as acceptance tests, a particular path can be defined, for example (700 ± 150) mm from the edge of the running lane of a road.

3.19
theoretical water film thickness
thickness of a water film between a test wheel and a test pavement, assuming the pavement has zero texture depth

3.20
winter road
road surface having a temperature below +5 °C

Note 1 to entry: The road surface may be covered by snow and ice. The wet road skid resistance cannot be measured due to the risk of depositing ice on the road.

3.21
summer road
road surface having a temperature of 5 °C or more where wet road skid resistance can be measured

4 Recommended uses

The ViaFriction is used in the following fields of application:

— road network monitoring (Pavement Management measuring wet road skid resistance on summer roads and measuring dry road skid resistance on winter roads);

— approval of new surfacing;

— measurements after traffic accidents;

— investigation of surface skid resistance;

— comparative measurements among different devices;

— testing of tyres.