SLOVENSKI STANDARD
SIST EN 13036-6:2009

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Značilnosti cestnih in letaliških površin - Preskusne metode - 6. del: Merjenje prečnega in vzdolžnega profila valovnih dolžin v območjih ravnosti in megahrapavosti

Road and airfield surface characteristics - Test methods - Part 6: Measurement of transverse and longitudinal profiles in the evenness and megatexture wavelength ranges

Oberflächeneigenschaften von Straßen und Flugplätzen - Prüfverfahren - Teil 6: Bestimmung der Quer- und Längsprofile in den Wellenlängen der Ebenheit und der Megatextur

Caractéristiques de surface des routes et aéroports - Méthodes d'essais - Partie 6 : Mesure de profils transversaux et longitudinaux dans le domaine de longueurs d'onde correspondant a l'uni et a la mégatexture

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17.040.20	Lastnosti površin	Properties of surfaces
93.080.10	Gradnja cest	Road construction
93.120	Gradnja letališč	Construction of airports

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Road and airfield surface characteristics - Test methods - Part 6: Measurement of transverse and longitudinal profiles in the evenness and megatexture wavelength ranges

Caractéristiques de surface des routes et aérodromes - Méthodes d'essais - Partie 6 : Mesure de profils transversaux et longitudinaux dans le domaine de longueurs d'onde correspondant à l'uni et à la mégatexture

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Foreword

This document (EN 13036-6:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

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Introduction

This European Standard details the criteria for classifying profilometers according to profiling capabilities as well as the procedures for measuring transverse and longitudinal profiles in the evenness and megatexture wavelength ranges, independent of the test method and the equipment used.

The requirements regarding the performance of the measurement shall be independent of the measurement method used. This basic principle permits the development of new technologies and a variety of measurement devices without the need to modify this standard.

This European Standard is restricted to requirements about measurement specifications (e.g. accuracy, resolution, wavelength range).

Compliance with the requirements and classifications outlined in this standard will result in a geometrical representation of a profile intended to be used for research purposes or for further analysis aiming at summary indices for transverse profiles and/or longitudinal profiles in the evenness and megatexture wavelength ranges.

Evenness of pavements is important for reasons of safety, comfort and behaviour of vehicles, (pay)loads, road and bridge constructions, fuel consumption, etc.

Evenness demands are related to the speed limits, the kind of traffic, the climatic conditions, the accepted comfort limits, etc.

1 Scope

This European Standard establishes the minimum requirements and criteria for classification and measurement procedures with profiling devices, designed for the measurement of transverse and/or longitudinal profiles in the unevenness and megatexture wavelength ranges. Recommendations for verification and calibration are included.

Profiling devices are equipment to measure evenness of pavements in the longitudinal and/or in the transverse direction of the pavement.

Highway agencies, airfield authorities, equipment manufacturers, and other organizations can use this standard to define the measuring capabilities of survey equipment that collects the data necessary to characterize surface conditions.

Evenness measurements can be performed by means of static or dynamic devices. The standard includes high-speed, low-speed, and stationary equipment.

NOTE A dynamic measurement is a measurement executed out of a device running in the normal traffic flow at the accepted minimum speed or at higher speed (high-speed).

2 Terms and definitions

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

2.1
longitudinal profile
intersection between the pavement surface and a conventional reference plane perpendicular to the pavement surface and parallel to the lane direction

2.2
transverse profile
intersection between the pavement surface and a reference plane perpendicular to the pavement surface and to the lane direction

2.3
wavelength
distance between periodically repeated parts of a sinusoidal curve

2.4
unevenness
deviation of a pavement surface from a true filtered planar surface in a wavelength range of 0,5 m to 50 m

2.5
megatexture
deviation of a pavement surface from a filtered true planar surface in a wavelength range of 50 mm to 500 mm

2.6
profiling
method in which a measurement of a pavement surface profile is recorded for subsequent analysis. The profile data are used for calculating certain mathematically defined parameters

2.7
crossfall
transverse gradient across a section or full width of a pavement measured perpendicular to the centre line

NOTE Crossfall can be expressed as a percentage, a ratio (e.g. 1 in 30) or as an angle to the horizontal. By convention, it is positive when the right end of the profile is lower than its left end.

2.8
surface line
angle between the horizontal and a line touching the surface at a point to the left of the left wheel path and a point to the right of the right wheel path

2.9
regression line
angle between the horizontal and the regression straight line through the transverse road profile defined by at least seven measurement points spaced across that profile

2.10
rut bottom line
angle between the horizontal and a line touching the bottoms of the left and right wheel paths defined by three measurement points

2.11
design crossfall
represents the crossfall of the desired transverse profile

2.12
constructed crossfall
represents the best straight line through the new constructed transverse profile

2.13
actual crossfall
represented by one of the three definitions (see 2.8, 2.9 or 2.10)

NOTE It should be specified in the report which definition has been used.

2.14
test track
road section or special track where the tests are carried out, identified by a code

EXAMPLE Section P

2.15
test section
part of a pavement surface containing lane(s) with known geometrical data

2.16
calibration section
test section with known surface geometry

2.17
reference profile
digitised geometric description of a longitudinal or transversal road profile obtained by means of a profiling method with well-known reliability accuracy better than the one requested for the corresponding class of dynamic profilometers

2.18
accuracy
closeness of the agreement between the result of a measurement and a true value of the measured

2.19
travelled distance accuracy
maximum relative error in percent on the measurement of the distance travelled by the measuring vehicle

2.20
transverse gradient measurement accuracy
maximum absolute error on the determination of the transverse slope of the agreed gradient reference system

2.21
vertical resolution (longitudinal and transversal)
smallest difference in elevation that can be detected

2.22
horizontal resolution (longitudinal and transversal)
smallest horizontal distance over which a change in elevation can be detected

2.23
longitudinal acquisition sampling interval
distance between two consecutive data points in a discrete longitudinal profile measurement

2.24
transversal acquisition sampling interval
distance between two consecutive data points in a discrete transversal profile measurement in transverse direction (sensor spacing)

NOTE If the distances between the sensors are not equal, the mean value is calculated.

2.25
reporting sampling interval (longitudinal and transversal)
distance corresponding to the interval between two consecutive reported measurement results

2.26
acquisition repetition interval (transversal)
travelled distance between two consecutive transverse profile measurements

2.27
reporting repetition interval (transversal)
distance corresponding to the longitudinal interval between two consecutive reported measurement results of transverse profiles

2.28
operator
person responsible for the execution of the measurement

3 Equipment performance classification

3.1 General

The classification of equipment is expressed as a code (see Table 1).