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Road and airfield surface characteristics - Test methods - Part 5: Determination of longitudinal unevenness indices

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

Road and airfield surface characteristics - Test methods - Part 5: Determination of longitudinal unevenness indices

Caractéristiques de surface des routes et aérodromes - Méthodes d'essais - Partie 5 : Détermination des indices d'uni longitudinal

Oberflächeneigenschaften von Straßen und Flugplätzen - Prüfverfahren - Teil 5: Bestimmung der Längsunebenheitindizes

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 13036-5:2019) 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of an identical text or by endorsement, at the latest by March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Introduction

Through road/vehicle dynamic interaction and vehicle vibration, the road profile evenness affects safety (tyre contact forces), ride quality, energy consumption, vehicle wear as well as pavement and road durability. The road profile evenness is consequently key information for road maintenance-management-systems and performance control.

The purpose of this document is to provide a standard practice for calculating and reporting estimates of road evenness from digitized longitudinal profiles.

This practice covers the mathematical processing of longitudinal profile measurements to produce evenness statistics (indices) covering the wavelength range 0,5 m to 50 m. These wavelengths cover most situations for cars[1)]. The practice describes the calculation procedure for the International Roughness Index (IRI), wave band analysis (Root Mean Square (RMS) and Longitudinal Profile Variance (LPV)) and the Weighted Longitudinal Profile (WLP).

The purpose of the practice is to ensure that when applying one of the possible procedures, exactly the same steps are carried out, with the aim of facilitating the comparison of evenness measurements carried out with different profiling instruments in European countries. The Wave band analysis procedures are informative and therefore IRI is preferred as benchmarking parameter.

NOTE As a control of the implementation of calculation of the evenness indices, three longitudinal profiles are available including the “true values”. They can be found at www.erpug.org in the directory *reference profiles*. More on this can be found in Annex F.

1) For higher speed, e.g. on airport runways or highways, longer wavelengths could also be important.

1 Scope

This document specifies the mathematical processing of digitized longitudinal profile measurements to produce evenness indices. The document describes the calculation procedure for the International Roughness Index (IRI), Root Mean Square (RMS) and Longitudinal Profile Variance (LPV) from three separate wavelength bands and the σWLP and ΔWLP from the Weighted Longitudinal Profile (WLP).

The purpose of this document is to provide a standard practice for calculating and reporting estimates of road evenness from digitized longitudinal profiles. Other aims with this document are to facilitate the comparison of evenness measurement results carried out with different profiling instruments in European countries.

The evenness range covered in this document is defined as the wavelength range 0,5 m to 50 m. It is noted that both shorter and longer wavelengths can also influence the driving comfort but those are not covered in this document.

The quantified evenness indices derived from this document are useful support for pavement management systems. The output can also be used for type approval and performance control of new and old pavements. The indices can be used on rigid, flexible and gravel road surfaces.

This document doesn't define from what position on the road the longitudinal profile should be obtained.

The derived indices are portable in the sense that they can be obtained from longitudinal profiles measured with a variety of instruments.

2 Normative references

There are no normative references in this document.