INTERNATIONAL STANDARD

ISO 13473-1

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Characterization of pavement texture by use of surface profiles —

Part 1:
Determination of Mean Profile Depth

Caractérisation de la texture d'un revêtement de chaussée à partir de relevés de profil —

Partie 1: Détermination de la profondeur moyenne de la texture

Reference number
ISO 13473-1:1997(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13473-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

ISO 13473 consists of the following parts, under the general title *Characterization of pavement texture by use of surface profiles*:

— *Part 1: Determination of Mean Profile Depth*

— *Part 2: Terminology related to pavement texture profile analysis*

— *Part 3: Specifications and classification of profilometers*

Annexes A to F of this part of ISO 13473 are for information only.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

Introduction

Road surface texture determines factors such as noise emission from the tyre/pavement interface, friction between the tyre and road, rolling resistance and tyre wear. Valid methods for measuring surface texture are therefore highly desirable.

The so-called 'sand patch' method, or the more general 'volumetric patch' method (see clause 3, Definitions) has been used worldwide for many years to give a single and very simple measurement describing surface texture. It relies on a given volume of sand or glass spheres which is spread out on a surface. The material is distributed to form a circular patch, the diameter of which is measured. By dividing the volume of material spread out by the area covered, a value is obtained which represents the average depth of the sand or glass sphere layer, i.e. a 'mean texture depth'. The method has been standardized in ISO 10844 in order to put limits as to surface texture for a reference surface used for vehicle noise testing.

The volumetric patch method is very crude; it is operator-dependent and can be used only on surfaces which are partly or fully closed to traffic. Therefore, it is not practical for use in network surveys of roads, for example. Along with developments in contactless surface profiling techniques, it has become possible to replace the volumetric patch measurements with those derived from profile recordings. However, several very different techniques have been used to calculate 'predicted mean texture depths', many of them quite successfully. The values they give are not always comparable, although individually they generally offer good correlation coefficients with texture depth measured with the volumetric patch method.

It is therefore important to have a standardized method for measuring the texture depth by a more modern, safe and economical technique than the traditional volumetric patch method, resulting in values which are directly compatible both with the patch-measured values and between different equipment.

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Part 1:
Determination of Mean Profile Depth

1 Scope

This part of ISO 13473 describes a test method to determine the average depth of pavement surface macrotexture (see clause 3, Definitions) by measuring the profile curve of a surface and calculating the texture depth from this profile. The technique is designed to provide an average depth value of only the pavement macrotexture and is considered insensitive to pavement microtexture and unevenness characteristics.

The objective of this part of ISO 13473 is to make available an internationally accepted procedure for determination of pavement surface texture depth which is an alternative to the traditionally used volumetric patch technique (generally using sand or glass spheres), giving comparable texture values.

This ISO 13473 series has been prepared as a result of a need identified when specifying a test surface for vehicle noise measurement (ISO 10844). Macrotexture depth measurements according to this International Standard are not generally adequate for specifying test conditions of vehicle or traffic noise measurements, but have limited applications as a *supplement* in conjunction with other ways of specifying a surfacing.

This test method is suitable for determining the Mean Profile Depth of a pavement surface. This Mean Profile Depth can be transformed to a quantity which estimates the macrotexture depth according to the volumetric patch method. It is applicable to field tests as well as laboratory tests on pavement samples. When used in conjunction with other physical tests, the macrotexture depth values derived from this test method are applicable to estimation of pavement skid resistance characteristics (see e.g. reference [1]), estimation of noise chacteristics (see e.g. ISO 10844), and assessment of the suitability of paving materials or pavement finishing techniques.

The method, together with other measurements (where applicable) such as porosity or microtexture can be used to assess the quality of pavements.

Pavement aggregate particle shape, size, and distribution are surface texture features not addressed in this procedure. The method is not meant to provide a complete assessment of pavement surface texture characteristics. In particular, care should be exercised in interpreting the result if the method is applied to porous surfaces or to grooved surfaces (see annex B).

NOTE 1 - Other International Standards dealing with surface profiling methods include for example ISO 468, ISO 1878, ISO 1879, ISO 1880, ISO 3274, ISO 4287 and ISO 4288 (see annex F). Although it is not clearly stated in these, they are mainly used for measuring surface finish (microtexture) of metal surfaces and do not apply to pavements. This part of ISO 13473 is adapted for pavement texture measurement and is not intended for other applications.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 13473. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 13473 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10844:1994, *Acoustics — Specification of test tracks for the purpose of measuring noise emitted by road vehicles*