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Acoustics - Measurement of the influence of road surfaces on traffic noise - Part 2: The close-proximity method (ISO 11819-2:2017)

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

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EUROPEAN STANDARD

EN ISO 11819-2

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English Version

**Acoustics - Measurement of the influence of road surfaces
on traffic noise - Part 2: The close-proximity method (ISO
11819-2:2017)**

Acoustique - Méthode de mesurage de l'influence des
revêtements de chaussées sur le bruit émis par la
circulation - Partie 2: Méthode de proximité immédiate
(ISO 11819-2:2017)

Akustik - Messung des Einflusses von
Straßenoberflächen auf Verkehrsgläusche - Teil 2:
Nahfeldmessverfahren (ISO 11819-2:2017)

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European foreword

This document (EN ISO 11819-2:2017) has been prepared by Technical Committee ISO/TC 43 “Acoustics” in collaboration with 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of an identical text or by endorsement, at the latest by October 2017, and conflicting national standards shall be withdrawn at the latest by October 2017.

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**Acoustics — Measurement of the
influence of road surfaces on traffic
noise —**

Part 2:
The close-proximity method

*Acoustique — Méthode de mesurage de l'influence des revêtements de
chaussées sur le bruit émis par la circulation —*

Partie 2: Méthode de proximité immédiate





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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

A list of all parts in the ISO 11819 series can be found on the ISO website.

Introduction

The emission and propagation of road traffic noise greatly depends on road surface characteristics, notably on texture, flow resistivity and acoustic absorption. All these characteristics influence the generation of tyre/road noise and, in addition, the acoustic absorption can influence the propagation of sound, particularly when the propagation takes place close to the surface. Power unit noise, which is usually generated at a greater height above the road surface than tyre/road noise, may also be affected during propagation by the porosity characteristics of the road surface. These effects lead to differences in sound pressure levels, associated with a given traffic flow and composition, from different road surfaces of up to 15 dB, which can have a substantial impact on the environmental quality alongside a road.

It is therefore important to be able to measure the influence of surface characteristics on tyre/road noise by a standardized method. Within the constraints of this method, this document offers an objective rating of the road characteristics to satisfy a need expressed by road planners, road administrators, contractors, manufacturers of so-called “low-noise surfaces” and other parties concerned with the control of road traffic noise.

A method satisfying the needs expressed in the foregoing, but having serious practical constraints, appears in ISO 11819-1. That method, called the statistical pass-by (SPB) method, is intended for use essentially for two main purposes. It can be used: first, to classify surfaces in typical and good condition as a type according to their influence on traffic noise (surface classification); and second, to evaluate the influence on traffic noise of different surfaces at particular sites irrespective of condition and age. However, due to severe requirements on the acoustical environment at the measurement site, the method cannot generally be used for approval of new or rebuilt surfaces at any arbitrary location. In addition, the SPB method has a number of other practical limitations, which are outlined in [Annex D](#).

The method specified in this document, together with ISO/TS 11819-3, complements the SPB method in applications where the latter has limitations.

Acoustics — Measurement of the influence of road surfaces on traffic noise —

Part 2: The close-proximity method

1 Scope

This document specifies a method of evaluating different road surfaces with respect to their influence on traffic noise, under conditions when tyre/road noise dominates. The interpretation of the results applies to free-flowing traffic travelling on essentially level roads at constant speeds of 40 km/h and upwards, in which cases tyre/road noise is assumed to dominate (although in some countries it is possible that tyre/road noise does not dominate at 40 km/h when the proportion of heavy vehicles is high). For other driving conditions where traffic is not free-flowing, such as at junctions or under heavy acceleration, and where the traffic is congested, the influence of the road surface on noise emission is more complex. This is also the case for roads with high longitudinal gradients and a high proportion of heavy vehicles.

A standard method for comparing noise characteristics of road surfaces gives road and environment authorities a tool for establishing common practices or limits as to the use of surfacings meeting certain noise criteria. However, it is not within the scope of this document to suggest such criteria.

ISO 11819-1 defines another method: the statistical pass-by (SPB) method. The close-proximity (CPX) method specified in the present document has the same main objectives as the SPB method, but is intended to be used specifically in applications that are complementary to it, such as:

- noise characterization of road surfaces at almost any arbitrary site, with the main purpose of checking compliance with a surface specification (an example for conformity of production is suggested in Reference [1]);
- checking the acoustic effect of maintenance and condition, e.g. wear of and damage to surfaces, as well as clogging and the effect of cleaning of porous surfaces;
- checking the longitudinal and lateral homogeneity of a road section;
- the development of quieter road surfaces and research on tyre/road interaction.

NOTE This document does not describe the conditions of application for formal purposes of the measurement with the CPX method. Such conditions may be defined in other standards or legal texts. However, suggestions for the applicability of ISO 11819-1 and this document are provided in [Annex D](#).

Measurements with the CPX method are faster and more practical than with the SPB method, but are more limited in the sense that it is relevant only in cases where tyre/road noise dominates and power unit noise can be neglected. Furthermore, it cannot take heavy vehicle tyre/road noise into account as fully as the SPB method can, since it uses a light truck tyre as a proxy for heavy vehicle tyres and does not take power unit noise into account.

The CPX method specified in this document is intended to measure the properties of road surfaces, not the properties of tyres. If the method is used for research purposes, to provide an indication of differences between tyres, the loads and inflations would normally be adjusted to other values than specified in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

ISO 11819-1, *Acoustics — Measurement of the influence of road surfaces on traffic noise — Part 1: Statistical Pass-By method*

ISO/TS 11819-3, *Acoustics — Measurement of the influence of road surfaces on traffic noise — Part 3: Reference tyres*

ISO/TS 13471-1, *Acoustics — Temperature influence on tyre/road noise measurement — Part 1: Correction for temperature when testing with the CPX method*

IEC 60942, *Electroacoustics — Sound calibrators*

IEC 61260-1, *Electroacoustics — Octave-band and fractional-octave-band filters — Part 1: Specifications*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

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