TECHNICAL SPECIFICATION

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Acoustics — Temperature influence on tyre/road noise measurement —

Part 1: Correction for temperature when testing with the CPX method

Acoustique — Effet de la température sur les essais de bruit pneu/route —

Partie 1: Mode opératoire de correction sur les essais avec la méthode CPX

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the parts in the ISO/TS 13471 series can be found on the ISO website.

Introduction

Air, tyre and road surface temperatures affect noise emission from the tyre/road interaction, as measured by means of, for example, the close-proximity (CPX) method specified in ISO 11819-2. This method allows the user to make measurements within a wide air temperature range (5 °C to 35 °C) which means that temperature influence on the results may be substantial.

In the CPX method, one or two reference tyres may be used, as specified in ISO/TS 11819-3; consequently, the temperature corrections need to be valid for these reference tyres. Tyre properties like rubber hysteresis and tread rubber hardness are affected by temperature, but the latter may also affect road surface properties. Temperature effects on noise, therefore, depend on both the tyre and the road surface, the temperatures of which are affected by ambient air temperature. To make it more complicated, the temperature probably has different effects on different noise generation mechanisms. Ideally, and whenever possible, temperature corrections shall be tailored to the tested tyre/road combination.

The approach to the temperature correction in this document is semi-generic, which means that under certain conditions a correction to noise for temperature is made common to a group of tyres or a group of road surfaces. This document makes a distinction to the two reference tyres and to a few major road pavement categories.

Acoustics — Temperature influence on tyre/road noise measurement —

Part 1:
Correction for temperature when testing with the CPX method

1 Scope

This document specifies procedures for determining the effect of temperature on tyre/road noise emission. Temperatures considered are tyre, road and ambient air temperatures.

The noise emission for which this document is applicable is measured by means of ISO 11819-2, or similar methods such as the on-board sound intensity (OBSI) method specified in Reference [1]. Measurement results obtained at a certain temperature, which may vary over a wide range, are normalized to a designated reference temperature (20 °C) using a correction procedure 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 11819-2, *Acoustics — Measurement of the influence of road surfaces on traffic noise — Part 2: The close-proximity method*

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

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

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Acoustics

3.1.1
tyre/road noise
noise generated by the tyre/road interaction