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**Acoustics — Temperature influence on  
tyre/road noise measurement —**

**Part 2:  
Correction for temperature when  
testing with the pass-by methods**

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

*Partie 2: Correction de la température lors des essais utilisant les  
méthodes au passage*



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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](http://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](http://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 of 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 [www.iso.org/iso/foreword.html](http://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/TS 13471 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

Air, tyre and road surface temperatures affect noise emission from the tyre/road interaction, as measured by means of, for example, the statistical pass-by (SPB) method specified in ISO 11819-1 or other pass-by methods. These methods allow 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.

Another common type of measurement where temperature effects on tyre/road noise are significant is for noise tests on tyres most commonly conducted as pass-by on test tracks with a reference surface according to ISO 10844<sup>[1]</sup>. This case is also considered in this document, with the aim to reduce the uncertainties in such measurements. These are often made for legal purposes, such as type approval or labelling of tyres or vehicles where tyres are the dominant noise source. This is further dealt with in [Annex A](#).

Temperature effects on noise depend on both the tyre and the road surface, the temperatures of which are affected by ambient air temperature. The temperature has different effects on different noise generation mechanisms and when also considering the effect of possible power unit noise mixed with tyre/road noise, the temperature effect becomes even more complicated. Ideally, and whenever possible, temperature corrections shall be tailored to not only the tested tyre/road combination as well as to different tyre and vehicle categories, but also to the type of measurement method. For example, there is also a Technical Specification related to the CPX method (ISO/TS 13471-1<sup>[2]</sup>).

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 vehicles and tyres or a group of road surfaces as it is impossible to do it for each tyre and road surface combination. This document makes a distinction to cars and heavy vehicles and to a few major road pavement categories, and also takes into account local, regional or national conditions.



# Acoustics — Temperature influence on tyre/road noise measurement —

## Part 2: Correction for temperature when testing with the pass-by methods

### 1 Scope

This document specifies correction procedures for the effect of temperature on vehicle noise emission, as influenced by the tyre/road noise contribution. Temperatures considered are road and ambient air temperatures.

The noise emission for which this document is applicable is measured by means of ISO 11819-1, or similar methods such as the American methods SIP and CTIM specified in References [3][4]. It is also applicable to other pass-by measurements conducted without acceleration, such as when testing tyres and vehicles on test tracks with ISO 10844[1] reference surfaces; however, given that tyre/road noise is dominant.

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 11819-1, *Acoustics — Measurement of the influence of road surfaces on traffic noise — Part 1: The statistical pass-by method*

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:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1 Acoustics

##### 3.1.1 vehicle noise

total noise from an individual vehicle, the two major components of which are *power unit noise* (3.1.3) and *tyre/road noise* (3.1.2)