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Acoustics — Measurement of sound absorption properties of road surfaces *in situ* —

Part 2: Spot method for reflective surfaces

Acoustique — Mesurage in situ des propriétés d'absorption acoustique des revêtements de chaussées —

Partie 2: Méthode ponctuelle pour les surfaces réfléchissantes



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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.

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The main task of technical committees is to prepare International Standards. 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.

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.

ISO 13472-2 was prepared by Technical Committee ISO/TC 43, Acoustics, Subcommittee SC 1, Noise.

ISO 13472 consists of the following parts, under the general title *Acoustics* — *Measurement of sound absorption properties of road surfaces* in situ:

- Part 1: Extended surface method
- Part 2: Spot method for reflective surfaces

Introduction

This part of ISO 13472 specifies a test method for measuring *in situ* the sound absorption coefficient of road surfaces as a function of frequency under normal incidence.

This method enables evaluation of the sound absorption characteristics of a road surface without damaging the surface. It is intended to be used to qualify the absorption characteristics of road surfaces used for vehicle and tyre testing. It may also be used during road construction, road maintenance, and other traffic noise studies. However, the field of application is limited to low absorption surfaces.

The method specified in this part of ISO 13472 is based on propagation of the test signal from the source to the road surface and back to the receiver through an impedance tube. The tube covers an area of approximately $0,008 \text{ m}^2$ and a frequency range, in one-third-octave bands, from 250 Hz to 1 600 Hz. It uses the test procedure and signal processing specified in ISO 10534-2, but because of the defined frequency range of application, the dimensions of the system are not adjustable, but fixed.

This method is primarily intended for smooth low absorption surfaces, such as those in accordance with ISO 10844. The method is not reliable if the measured sound absorption coefficient exceeds 0,15. Surfaces with values above 0,10 are not considered to be reflective.

This method is complementary to the extended surface method (ISO $13472-1^{[5]}$) that covers an area of approximately 3 m² and a frequency range, in one-third-octave bands, from 250 Hz to 4 000 Hz.

Both methods should give similar results in the frequency range from 315 Hz to 1 600 Hz, but their fields of application and therefore their accuracy differ strongly. The method described in ISO 13472-1^[5] has limited accuracy at small sound absorption values and is therefore unsuitable for checking compliance of surfaces with the requirements of such documents as ISO 10844, while the method specified here fails at higher sound absorption values.

Within their ranges, the methods are also applicable to acoustic materials other than road surfaces.

The measurement results of this method are comparable to the results of the impedance tube method, performed on bore cores taken from the surface in accordance with documents such as ISO $10534-1^{[4]}$, ISO 10534-2 and ASTM E $1050^{[7]}$.

The measurement results obtained with this method are in general not comparable to the results of the reverberation room method (ISO 354^[1]), because the method described in this part of ISO 13472 uses a plane progressive wave at perpendicular incidence, while the reverberation room method uses a diffuse sound field.