INTERNATIONAL STANDARD

ISO 12999-2

First edition
2020-06

Acoustics — Determination and application of measurement uncertainties in building acoustics —

Part 2: Sound absorption

Acoustique — Détermination et application des incertitudes de mesure dans l'acoustique des bâtiments —

Partie 2: Absorption acoustique

Reference number
ISO 12999-2:2020(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 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.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 126, *Acoustic properties of building elements and of buildings,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 12999 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.

Introduction

An assessment of uncertainties that is comprehensible and close to reality is indispensable for reporting and applying measured sound absorption. Uncertainties should preferably be determined following the principles of ISO/IEC Guide 98-3.

ISO/IEC Guide 98-3 specifies a detailed procedure for the uncertainty evaluation that is based upon a complete mathematical model of the measurement procedure. At the current knowledge, it is impossible to formulate these models for sound absorption measurements according to ISO 354 and evaluations according to ISO 11654 or similar. To come to uncertainties all the same, the concept of reproducibility and repeatability is applied in this document. This concept offers the possibility to state the uncertainty of a method and of measurements carried out according to the method, based on the results of inter-laboratory measurements.

Observed uncertainties are probably caused by different laboratory designs. When the method of ISO 354 for measuring sound absorption is modified, other uncertainties than the ones given in this document can be applicable.

Acoustics — Determination and application of measurement uncertainties in building acoustics —

Part 2: Sound absorption

1 Scope

This document specifies how to calculate:

— the uncertainty of sound absorption coefficients and equivalent sound absorption areas measured according to ISO 354;

— the uncertainty of the practical and weighted sound absorption coefficients determined according to ISO 11654;

— the uncertainty of the object sound absorption coefficient according to ISO 20189; and

— the uncertainty of the single number rating determined according to EN 1793-1.

Furthermore, the use of uncertainties in reporting measured or weighted sound absorption coefficients is explained.

2 Normative references

There are no normative references in this document.

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 http://www.electropedia.org/

3.1
measurand
quantity intended to be measured

EXAMPLE The sound absorption coefficient of a particular test specimen measured according to ISO 354.

[SOURCE: ISO/IEC Guide 99:2007, 2.3, modified — The Notes to entry have been deleted and the example has been added.]

3.2
measurement result
value attributed to a *measurand* (3.1), obtained by following the complete set of instructions given in a measurement procedure

Note 1 to entry: The measurement result is the sound absorption coefficient in one-third octave bands according to the procedure of ISO 354 or a (single number) value according to a rating procedure of EN 1793-1 or ISO 11654.