INTERNATIONAL STANDARD

ISO 10848-1

Second edition
2017-09

Acoustics — Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms —

Part 1: Frame document

Acoustique — Mesurage en laboratoire et sur site des transmissions latérales du bruit aérien, des bruits de choc et du bruit d'équipement technique de bâtiment entre des pièces adjacentes —

Partie 1: Document cadre

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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 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 ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*.

This second edition cancels and replaces the first edition (ISO 10848-1:2006), which has been technically revised with the following changes:

a) extension to field measurements;

b) extension to building service equipment;

c) normalized direction-averaged vibration level difference for junctions between lightweight elements has been introduced;

d) an assessment method for the decrease in vibration level with distance has been introduced;

e) transmission function measurements with a calibrated structure-borne sound source has been introduced;

f) definitions of element types A and B to avoid issues with the terms “heavy” and “light” have been added.

A list of all the parts in the ISO 10848 series can be found on the ISO website.

Acoustics — Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms —

Part 1: Frame document

1 Scope

ISO 10848 (all parts) specifies measurement methods to characterize the flanking transmission of one or several building components. These measurements are performed in a laboratory test facility or in the field.

The performance of the building components is expressed either as an overall quantity for the combination of elements and junction (such as the normalized flanking level difference and/or normalized flanking impact sound pressure level) or as the vibration reduction index of a junction or the normalized direction-average vibration level difference of a junction.

Two approaches are used for structure-borne sound sources in buildings, a normalized flanking equipment sound pressure level and a transmission function that can be used to estimate sound pressure levels in a receiving room due to structure-borne excitation by service equipment in a source room. The former approach assumes that flanking transmission is limited to one junction (or no junction if the element supporting the equipment is the separating element), and the latter considers the combination of direct (if any) and all flanking transmission paths.

This document contains definitions, general requirements for test elements and test rooms, and measurement methods. Guidelines are given for the selection of the quantity to be measured, depending on the junction and the types of building elements involved. Other parts of ISO 10848 specify the application for different types of junction and building elements.

The quantities characterizing the flanking transmission can be used to compare different products, or to express a requirement, or as input data for prediction methods, such as ISO 12354-1 and ISO 12354-2.

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 717-1, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation*

ISO 717-2, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 2: Impact sound insulation*

ISO 3382-2, *Acoustics — Measurement of room acoustic parameters — Part 2: Reverberation time in ordinary rooms*

ISO 7626-1, *Mechanical vibration and shock — Experimental determination of mechanical mobility — Part 1: Basic terms and definitions, and transducer specifications*

ISO 7626-5, *Vibration and shock — Experimental determination of mechanical mobility — Part 5: Measurements using impact excitation with an exciter which is not attached to the structure*

ISO 10140-4:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 4: Measurement procedures and requirements*

ISO 10140-5:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 5: Requirements for test facilities and equipment*

IEC 61183, *Electroacoustics—Random-incidence and diffuse-field calibration of sound level meters*

IEC 61260 (all parts), *Electroacoustics — Octave-band and fractional-octave-band filters*

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

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
average sound pressure level in a room
L
ten times the common logarithm of the ratio of the space and time average of the sound pressure squared to the square of the reference sound pressure, the space average being taken over the entire room with the exception of those parts where the direct radiation of a sound source or the near field of the boundaries (walls, etc.) is of significant influence

Note 1 to entry: This quantity is expressed in decibels.

Note 2 to entry: If a continuously moving microphone is used, L is determined as follows:

$$L = 10\lg\left(\frac{\frac{1}{T_\mathrm{m}}\int_0^{T_\mathrm{m}} p^2(t)\,\mathrm{d}t}{p_0^2}\right)$$

3.2
normalized flanking level difference
$D_{\mathrm{n,f}}$
difference in the space and time averaged sound pressure level produced in two rooms by one or more sound sources in one of them, when the transmission only occurs through a specified flanking path and the result is normalized to an equivalent sound absorption area in the receiving room as follows:

$$D_{\mathrm{n,f}} = L_1 - L_2 - 10\lg\frac{A}{A_0}$$

where

L_1 is the average sound pressure level in the source room, in dB;

L_2 is the average sound pressure level in the receiving room, in dB;

A is the equivalent sound absorption area in the receiving room, in m^2;

A_0 is the reference equivalent sound absorption area, in m^2; A_0 = 10 m^2

Note 1 to entry: This quantity is expressed in decibels.