INTERNATIONAL STANDARD

ISO 10140-3

First edition
2010-09-01

AMENDMENT 1
2015-06-01

Acoustics — Laboratory measurement of sound insulation of building elements —

Part 3: Measurement of impact sound insulation

AMENDMENT 1

Acoustique — Mesurage en laboratoire de l'isolation acoustique des éléments de construction —

Partie 3: Mesurage de l'isolation au bruit de choc

AMENDEMENT 1

Reference number
ISO 10140-3:2010/Amd.1:2015(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*.

Acoustics — Laboratory measurement of sound insulation of building elements —

Part 3: Measurement of impact sound insulation

AMENDMENT 1

Page v, Introduction

Delete the last sentence: "It is intended to update [...] ISO 10140 (all parts).".

Page 3, 5.2

Add the following paragraph as the third paragraph.

> "Also other types of impact sources can be applied, as for example rainfall on roofs and roof elements. Such sources are defined in ISO 10140-5:2010, Annex H, while the specific application is treated in ISO 10140-1:2010, Annex K."

Page 4

Add the following new subclause 5.4 and renumber the subsequent subclauses under Clause 5 accordingly.

5.4 Correction of airborne sound transmission

In case that the airborne sound transmission from the source to the receiving room cannot be neglected (this applies to situations where airborne and impact sound pressure level in the receiving room differ by less than 10 dB, for instance for long reverberation times in the source room or floors with good impact but poor airborne sound insulation) the measured impact sound shall be corrected. Make the correction in the following way:

a) Measure the sound levels generated by the tapping machine in the source and the receiving room, L_{TS} and L_i.

b) While running a loudspeaker in the source room, the resulting sound pressure levels in the source and receiving room, L_{LS} and L_{LR}, are measured. From the measured values, calculate the level difference $D = L_{LS} - L_{LR}$. To ensure constant measuring conditions, the loudspeaker shall already be in the source room during the measurement of impact sound. It shall be placed in an edge of the room in a height of 1,0 m and a distance of 1,0 m to the walls (the mentioned distances refer to the centre of the source). Further positions of the loudspeaker are not necessary. If the airborne sound reduction index R of the floor is known, D can be alternatively determined from $D = R - 10 \lg(S/A)$, where S is the floor area and A is the equivalent absorption area in the receiving room.

c) Calculate the normalized impact sound pressure level, L_n, according to Formula (3). If necessary, both L_i and L_{LR} should be corrected for background noise according to ISO 10140-4:2010, 4.3.

$$L_n = 10 \lg\left(10^{L_i/10} - 10^{(L_{TS}-D)/10}\right) + 10 \lg\left(\frac{A}{A_0}\right) \quad (3)$$

where

A is the equivalent absorption area in the receiving room;

A_0 = 10 m^2;

L_{TS} is the sound pressure level generated by the tapping machine in the source room;

L_i is the sound pressure level generated by the tapping machine in the receiving room.

The calculation is performed in one-third octave bands. If a correction for airborne sound is applied, this shall be mentioned in the test report. For the case that the condition $L_i - (L_{TS} - D) \geq 10$ dB is valid in all one-third octave bands a correction of airborne sound is not necessary. For $L_i - (L_{TS} - D) \leq 3$ dB sound transmission is dominated by airborne sound and impact sound insulation cannot be measured correctly.

Page 9, A.4

Add the following new subclause A.4.5.

A.4.5 Standardized maximum impact sound pressure level $L_{i,Fmax,V,T}$

The room-averaged maximum impact sound pressure level, $L_{i,Fmax}$, in the octave or one-third octave frequency band that is measured in the receiving room below the floor depends on the volume of the receiving room and its reverberation time. Therefore, for comparison of laboratory measurements with results from other laboratories or actual buildings, the result should be corrected to give $L'_{i,Fmax,V,T}$ using Formula (A.3):

$$L'_{i,Fmax,V,T} = L_{i,Fmax} + 10 \lg\frac{V}{V_0} - 10 \lg\left[\frac{1 - C_0^{-1}\left(C^{(1-C)^{-1}} - C^{-(1-C^{-1})^{-1}}\right)}{1 - C^{-1}\left(C_0^{(1-C_0)^{-1}} - C_0^{-(1-C_0^{-1})}\right)}\right] \quad (A.3)$$

where

$$C_0 = \frac{T_0}{1{,}7275} \quad (A.4)$$

$$C = \frac{T}{1{,}7275} \quad (A.5)$$

where

T is the reverberation time for the octave or one-third octave frequency band in the receiving room;

T_0 is the reference reverberation time; for dwellings, T_0 = 0,5 s;

V is the receiving room volume, in cubic metres;

V_0 is the reference receiving room volume, for dwellings, V_0 = 50 m^3;

The standardized maximum impact sound pressure level, $L_{i,Fmax,V,T}$, should be calculated using Formula (A.3) for the octave or one-third octave frequency bands specified in A.4.3.2.

ICS 91.120.20

Price based on 2 pages