SLOVENSKI STANDARD
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Akustika - Vrednotenje zvočne izolirnosti v stavbah in zvočne izolirnosti gradbenih elementov - 1. del: Izolirnost pred zvokom v zraku (ISO/DIS 717-1:2019)

Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (ISO/DIS 717-1:2019)

Akustik - Bewertung der Schalldämmung in Gebäuden und von Bauteilen - Teil 1: Luftschalldämmung (ISO/DIS 717-1:2019)

Acoustique - Évaluation de l'isolement acoustique des immeubles et des éléments de construction - Partie 1: Isolement aux bruits aériens (ISO/DIS 717-1:2019)

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Acoustics — Rating of sound insulation in buildings and of building elements —

Part 1: Airborne sound insulation

Acoustique — Évaluation de l'isolement acoustique des immeubles et des éléments de construction — Partie 1: Isolement aux bruits aériens

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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).

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

This fourth edition cancels and replaces the third edition (ISO 717-1:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

— relocate Annex G.6 from ISO 10140 into ISO 717-1:2018;

— relocate the smoothed reference spectra of the sound reduction index of the basic elements from ISO 10140-5:2018, Annex B;

— update references.

ISO 717 consists of the following parts, under the general title *Acoustics — Rating of sound insulation in buildings and of building elements*:

— *Part 1: Airborne sound insulation*

— *Part 2: Impact sound insulation*

Introduction

Methods of measurement of airborne sound insulation of building elements and in buildings have been standardized e.g. in ISO 10140-2, ISO 16283-1. The purpose of this part of ISO 717 is to standardize a method whereby the frequency-dependent values of airborne sound insulation can be converted into a single number characterizing the acoustical performance.

References to standards which provide data for single-number evaluation are meant to be examples and therefore are not complete.

Acoustics — Rating of sound insulation in buildings and of building elements —

Part 1: Airborne sound insulation

1 Scope

This part of ISO 717:

a) defines single-number quantities for airborne sound insulation in buildings and of building elements such as walls, floors, doors, and windows;

b) takes into consideration the different sound level spectra of various noise sources such as noise sources inside a building and traffic outside a building;

c) gives rules for determining these quantities from the results of measurements carried out in one-third-octave or octave bands for example in accordance with ISO 10140-2, and ISO 16283-1.

The single-number quantities in accordance with this part of ISO 717 are intended for rating airborne sound insulation and for simplifying the formulation of acoustical requirements in building codes. An additional single-number evaluation in steps of 0,1 dB is indicated for the expression of uncertainty (except for spectrum adaptation terms). The required numerical values of the single-number quantities are specified according to varying needs. The single-number quantities are based on results of measurements in one-third-octave bands or octave bands.

For laboratory measurements made in accordance with ISO 10140, single-number quantities should be calculated using one-third-octave bands only.

The rating of results of measurements carried out over an enlarged frequency range is dealt with in Annex B.

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 140-4, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 4: Field measurements of airborne sound insulation between rooms*

ISO 140-5, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 5: Field measurements of airborne sound insulation of façade elements and façades*

ISO 10140-2:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation*

ISO 16283-1:2014, *Acoustics — Field measurement of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation*

ISO 16283-3:2016, *Acoustics — Field measurement of sound insulation in buildings and of building elements — Part 3: Façade sound insulation*

ISO 10848-2:2017, *Acoustics — Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms — Part 2: Application to Type B elements when the junction has a small influence*

IEC 61672-1:2013, *Electroacoustics — Sound level meters – 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 https://www.iso.org/obp

3.1
single-number quantity for airborne sound insulation rating
value, in decibels, of the reference curve at 500 Hz after shifting it in accordance with the method specified in this part of ISO 717

Note 1 to entry: Terms and symbols for the single-number quantity used depend on the type of measurement. Examples are listed in Table 1 for airborne sound insulation properties of building elements and in Table 2 for airborne sound insulation in buildings. In general, new single-number quantities are derived in a similar way.

Table 1 — Single-number quantities of airborne sound insulation properties of building elements

Derived from one-third-octave band values		Defined in	
Single-number quantity	Term and symbol		
Weighted sound reduction index, R_w	Sound reduction index, R	ISO 10140-2:2010	Formula (2)
Weighted normalized flanking level difference, $D_{n,f,w}$	Normalized flanking level difference, $D_{n,f}$	ISO 10848-2:2017	Clause 3.1
Weighted element-normalized level difference, $D_{n,e,w}$	Element-normalized level difference, $D_{n,e}$	ISO 10140-2:2010	Formula (5)
Weighted joint sound insulation index, $R_{s,w}$	Joint sound insulation index, R_s	EN ISO 10140-1 Annex j.	Formula j1.
Weighted intensity sound insulation index, $R_{I,W}$	Intensity sound insulation index, R_I	EN ISO 15186-1.	Formula

Table 2 — Single-number quantities of airborne sound insulation in buildings

Derived from one third octave band values		Defined in	
Single-number quantity	Term and symbol		
Weighted apparent sound reduction index, R'_w	Apparent sound reduction index, R'	ISO 16283-1:2014 + Amd 1:2017	Formula (4)
Weighted apparent sound reduction index, $R'_{45°,w}$	Apparent sound reduction index, $R'_{45°}$	ISO 10140-2:2010	Formula (3)
Weighted apparent sound reduction index, $R'_{tr,s,w}$	Apparent sound reduction index, $R'_{tr,s}$	ISO 10140-2:2010	Formula (4)
Weighted normalized level difference, $D_{n,w}$	Normalized level difference, D_n	ISO 10140-2:2010	Formula (5)

Table 2 *(continued)*

Weighted standardized level difference, $D_{nT,w}$	Standardized level difference, D_{nT}	ISO 16283-1:2014	Formula (2)
Weighted standardized level difference, $D_{ls,2m,nT,w}$ or $D_{tr,2m,nT,w}$	Standardized level difference, $D_{ls,2m,nT}$ or $D_{tr,2m,nT}$	ISO 16283-3:2016	3.15
Weighted normalized level difference, $D_{ls,2m,n,w}$ or $D_{tr,2m,n,w}$	Normalized level difference, $D_{ls,2m,n}$ or $D_{tr,2m,n}$	ISO 16283-3:2016	3.16

3.2
spectrum adaptation term
value, in decibels, to be added to the single-number rating (e. g. R_w) to take account of the characteristics of particular sound spectra

Note 1 to entry: Two sound spectra are defined (in one-third-octave bands and in octave bands) in this part of ISO 717.

Note 2 to entry: Annex A gives information on the purpose of introducing these two spectrum adaptation terms C and C_{tr}.

4 Procedure for evaluating single-number quantities

4.1 General

The values obtained in accordance with e. g. ISO 10140-2, and ISO 16283-1 are compared with reference values (see 4.2) at the frequencies of measurement within the range 100 Hz to 3 150 Hz for one-third-octave bands and 125 Hz to 2 000 Hz for octave bands.

The comparison shall be carried out as specified in 4.4.

Furthermore, two spectrum adaptation terms shall be calculated (see 4.5) based on two typical spectra within the frequency range as quoted above. These two terms may optionally be supplemented by additional spectrum adaptation terms covering (if need be and if measured data are available) a wider frequency range between 50 Hz and 5 000 Hz.

4.2 Reference values

The set of reference values used for comparison with measurement results shall be as given in Table 3. The reference curves are shown in Figure 1 and Figure 2.

Table 3 — Reference values for airborne sound

Frequency	Reference values dB	
Hz	One-third-octave bands	Octave bands
100	33	
125	36	36
160	39	
200	42	
250	45	45
315	48	
400	51	
500	52	52
630	53	