

# SLOVENSKI STANDARD

## SIST EN ISO 10140-1:2016

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SIST EN ISO 10140-1:2010

SIST EN ISO 10140-1:2010/A1:2012

SIST EN ISO 10140-1:2010/A2:2014

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**Akustika - Laboratorijsko merjenje zvočne izolirnosti gradbenih elementov - 1. del:  
Pravila uporabe za določene izdelke (ISO 10140-1:2016)**

Acoustics - Laboratory measurement of sound insulation of building elements - Part 1:  
Application rules for specific products (ISO 10140-1:2016)

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Akustik - Messung der Schalldämmung von Bauteilen im Prüfstand - Teil 1:  
Anwendungsregeln für bestimmte Produkte (ISO 10140-1:2016)

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Acoustique - Mesurage en laboratoire de l'isolation acoustique des éléments de  
construction - Partie 1: Règles d'application pour produits particuliers (ISO 10140-  
1:2016)

**Ta slovenski standard je istoveten z: EN ISO 10140-1:2016**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 10140-1**

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ICS 91.120.20

Supersedes EN ISO 10140-1:2010

English Version

**Acoustics - Laboratory measurement of sound insulation  
of building elements - Part 1: Application rules for specific  
products (ISO 10140-1:2016)**

Acoustique - Mesurage en laboratoire de l'isolation  
acoustique des éléments de construction - Partie 1:  
Règles d'application pour produits particuliers (ISO  
10140-1:2016)

Akustik - Messung der Schalldämmung von Bauteilen  
im Prüfstand - Teil 1: Anwendungsregeln für  
bestimmte Produkte (ISO 10140-1:2016)

This European Standard was approved by CEN on 14 August 2016.

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## European foreword

This document (EN ISO 10140-1:2016) has been prepared by Technical Committee ISO/TC 43 "Acoustics" in collaboration with Technical Committee CEN/TC 126 "Acoustic properties of building elements and of buildings" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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The text of ISO 10140-1:2016 has been approved by CEN as EN ISO 10140-1:2016 without any modification.

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# INTERNATIONAL STANDARD

**ISO  
10140-1**

Second edition  
2016-08-15

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## **Acoustics — Laboratory measurement of sound insulation of building elements —**

### **Part 1: Application rules for specific products**

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*Acoustique — Mesurage en laboratoire de l'isolation acoustique des  
éléments de construction —  
Partie 1: Règles d'application pour produits particuliers*

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## ISO 10140-1:2016(E)

## 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](http://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](http://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*.

This second edition cancels and replaces the first edition (ISO 10140-1:2010), which has been technically revised.

It also incorporates the Amendments ISO 10140-1:2010/Amd 1:2012 and ISO 10140-1:2010/Amd 2:2014.

ISO 10140 consists of the following parts, under the general title *Acoustics — Laboratory measurement of sound insulation of building elements*:

- *Part 1: Application rules for specific products*
- *Part 2: Measurement of airborne sound insulation*
- *Part 3: Measurement of impact sound insulation*
- *Part 4: Measurement procedures and requirements*
- *Part 5: Requirements for test facilities and equipment*

## Introduction

ISO 10140 (all parts) concerns laboratory measurement of the sound insulation of building elements (see [Table 1](#)).

This part of ISO 10140 specifies the application rules for specific elements and products, including specific requirements for preparation, mounting, operating and test conditions. ISO 10140-2 and ISO 10140-3 contain the general procedures for airborne and impact sound insulation measurements, respectively, and refer to ISO 10140-4 and ISO 10140-5 where appropriate. For elements and products without a specific application rule described in this part of ISO 10140, it is possible to apply ISO 10140-2 and ISO 10140-3. ISO 10140-4 contains basic measurement techniques and processes. ISO 10140-5 contains the requirements for test facilities and equipment. For the structure of ISO 10140 (all parts), see [Table 1](#).

ISO 10140 (all parts) was created to improve the layout for laboratory measurements, ensure consistency and simplify future changes and additions regarding mounting conditions of test elements in laboratory and field measurements. It is intended for ISO 10140 (all parts) to present a well-written and arranged format for laboratory measurements.

It is intended to update this part of ISO 10140 with application rules for other products. It is also intended to incorporate ISO 140-18 into ISO 10140 (all parts).

**Table 1 — Structure and contents of ISO 10140 (all parts)**

Relevant part of ISO 10140	Main purpose, contents and use	Detailed content
ISO 10140-1	It indicates the appropriate test procedure for elements and products. For certain types of element/product, it can contain additional and more specific instructions about quantities and test element size and about preparation, mounting and operating conditions. Where no specific details are included, the general guidelines according ISO 10140-2 and ISO 10140-3.	Appropriate references to ISO 10140-2 and ISO 10140-3 and product-related, specific and additional instructions on: — specific quantities measured; — size of test element; — boundary and mounting conditions; — conditioning, testing and operating conditions; — additional specifics for test report.
ISO 10140-2	It gives a complete procedure for airborne sound insulation measurements according to ISO 10140-4 and ISO 10140-5. For products without specific application rules, it is sufficiently complete and general for the execution of measurements. However, for products with specific application rules, measurements are carried out according to ISO 10140-1, if available.	— Definitions of main quantities measured — General mounting and boundary conditions — General measurement procedure — Data processing — Test report (general points)
ISO 10140-3	It gives a complete procedure for impact sound insulation measurements according to ISO 10140-4 and ISO 10140-5. For products without specific application rules, it is sufficiently complete and general for the execution of measurements. However, for products with specific application rules, measurements are carried out according to ISO 10140-1, if available.	— Definitions of main quantities measured — General mounting and boundary conditions — General measurement procedure — Data processing — Test report (general points)

## ISO 10140-1:2016(E)

Table 1 — (continued)

Relevant part of ISO 10140	Main purpose, contents and use	Detailed content
ISO 10140-4	It gives all the basic measurement techniques and processes for measurement according to ISO 10140-2 and ISO 10140-3 or facility qualifications according to ISO 10140-5. Much of the content is implemented in software.	<ul style="list-style-type: none"> <li>— Definitions</li> <li>— Frequency range</li> <li>— Microphone positions</li> <li>— SPL measurements</li> <li>— Averaging, space and time</li> <li>— Correction for background noise</li> <li>— Reverberation time measurements</li> <li>— Loss factor measurements</li> <li>— Low-frequency measurements</li> <li>— Radiated sound power by velocity measurement</li> </ul>
ISO 10140-5	It specifies all information needed to design, construct and qualify the laboratory facility, its additional accessories and measurement equipment (hardware).	<p>Test facilities, design criteria:</p> <ul style="list-style-type: none"> <li>— volumes, dimensions;</li> <li>— flanking transmission;</li> <li>— laboratory loss factor;</li> <li>— maximum achievable sound reduction index;</li> <li>— reverberation time;</li> <li>— influence of lack of diffusivity in the laboratory.</li> </ul> <p>Test openings:</p> <ul style="list-style-type: none"> <li>— standard openings for walls and floors;</li> <li>— other openings (windows, doors, small technical elements);</li> <li>— filler walls in general.</li> </ul> <p>Requirements for equipment:</p> <ul style="list-style-type: none"> <li>— loudspeakers, number, positions;</li> <li>— tapping machine and other impact sources;</li> <li>— measurement equipment.</li> </ul> <p>Reference constructions:</p> <ul style="list-style-type: none"> <li>— basic elements for airborne and impact insulation improvement;</li> <li>— corresponding reference performance curves.</li> </ul>

# Acoustics — Laboratory measurement of sound insulation of building elements —

## Part 1: Application rules for specific products

### 1 Scope

This part of ISO 10140 specifies test requirements for building elements and products, including detailed requirements for preparation, mounting, operating and test conditions, as well as applicable quantities and additional test information for reporting. The general procedures for airborne and impact sound insulation measurements are given in ISO 10140-2 and ISO 10140-3, respectively.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 717-1:2013, *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* <https://standards.iteh.ai/catalog/standards/sist/5be8be07-538c-4945-9c23-a760b017e38c/sist-en-iso-10140-1-2016>

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

ISO 10140-3:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 3: Measurement of impact sound insulation*

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*

ISO 10140-5:2010/Amd 1:2014, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 5: Requirements for test facilities and equipment — Amendment 1: Rainfall sound*

ISO 12999-1:2014, *Acoustics — Determination and application of measurement uncertainties in building acoustics — Part 1: Sound insulation*

ISO 16940, *Glass in building — Glazing and airborne sound insulation — Measurement of the mechanical impedance of laminated glass*

EN 572-1, *Glass in building — Basic soda lime silicate glass products — Part 1: Definitions and general physical and mechanical properties*

EN 572-2, *Glass in building — Basic soda lime silicate glass products — Part 2: Float glass*

## ISO 10140-1:2016(E)

### 3 General

General requirements regarding boundary conditions and mounting of the test element in the laboratory are specified in ISO 10140-2, ISO 10140-3 and ISO 10140-5. Additional and more detailed requirements regarding preparation, mounting and operating conditions, and conditioning are given in [Annexes A, B, C, D, E, F, G, H, I, J and K](#).

NOTE For products which are not covered by [Annexes A, B, C, D, E, F, G, H, I, J or K](#), a new annex can be added, based on available knowledge and practice. The preferred structure of annexes is specified in [Clause 4](#).

When testing in accordance with ISO 10140 (all parts), this part of ISO 10140 shall always be checked for requirements relating to specific elements and products. The basic conditions specified in ISO 10140-2 or ISO 10140-3 shall always be followed.

### 4 Structure of application rules for specific products

To extend or update the [Annexes A, B, C, D, E, F, G, H, I, J and K](#), or to prepare a new annex with application rules for specific products, the required contents are listed below. For some elements or products, certain items might not be relevant. The purpose is to describe boundary, mounting and operating conditions for specific elements, products or groups of products.

- a) Application:
  - 1) definition of the element/product it applies to;
  - 2) quantities measured (if needed);
  - 3) reference to test method(s).
- b) Test element:
  - 1) size of the test opening and the test element;
  - 2) number of test elements.
- c) Boundary and mounting conditions (should be applied before installation):
  - 1) boundary conditions, e.g. filler wall, element boundaries;
  - 2) mounting positions;
  - 3) installation of the test element in the test opening.
- d) Test and operating conditions (should be applied after installation):
  - 1) operating conditions, e.g. open/close before test;
  - 2) conditioning/curing/drying;
  - 3) loading;
  - 4) environmental conditions.
- e) Test report.
- f) Additional information: if necessary, any information additional to the information that is required in basic ISO 10140-2 and ISO 10140-3.

## Annex A (normative)

### Walls — Airborne sound insulation

#### A.1 General

For walls and other partitions, ISO 10140-2 is applicable. This annex is applicable to lightweight twin leaf partitions, such as those constructed of gypsum boards.

The quantity determined is the sound reduction index,  $R$ , as a function of frequency. The definition of  $R$  is given in ISO 10140-2.

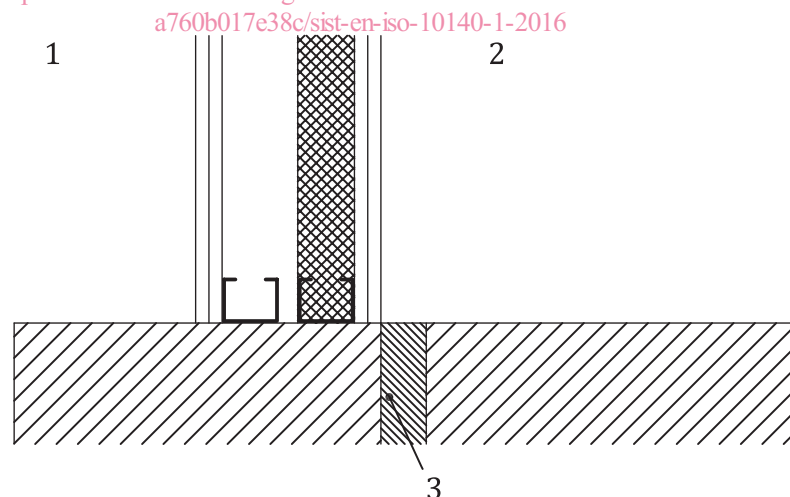
The general guidelines in the relevant clauses of the basic ISO 10140-2 shall always be followed.

#### A.2 Test element

The test opening for walls should be approximately 10 m<sup>2</sup>.

#### A.3 Boundary and mounting conditions

The sound reduction index of lightweight twin leaf partitions (e.g. twin leaf gypsum board walls) is influenced by the mounting conditions in the test opening of the laboratory. Important installation parameters include the niche depth and the position of the partition in relation to the acoustic break in the test aperture.



#### Key

- 1 source room
- 2 receiving room
- 3 acoustic break of the laboratory

**Figure A.1 — Example of the position of the test element relative to the acoustic break of the laboratory**

To improve the reproducibility between laboratories and facilitate comparison of sound reduction indices for different lightweight double walls, the twin leaf partition shall not be mounted across the