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**BS EN ISO 10140-1:2016**



**BSI Standards Publication**

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

Part 1: Application rules for specific  
products (ISO 10140-1:2016)

**bsi.**

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This British Standard is the UK implementation of EN ISO 10140-1:2016. It supersedes BS EN ISO 10140-1:2010+A2:2014 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EH/1/6, Building acoustics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2016.  
Published by BSI Standards Limited 2016

ISBN 978 0 580 88195 4

ICS 91.120.20

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2016.

**Amendments/corrigenda issued since publication**

Date	Text affected
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## EUROPÄISCHE NORM

August 2016

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.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## 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.

This document supersedes EN ISO 10140-1:2010.

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.

### Endorsement notice

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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## 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*

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## 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: <ul style="list-style-type: none"> <li>— specific quantities measured;</li> <li>— size of test element;</li> <li>— boundary and mounting conditions;</li> <li>— conditioning, testing and operating conditions;</li> <li>— additional specifics for test report.</li> </ul>
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.	<ul style="list-style-type: none"> <li>— Definitions of main quantities measured</li> <li>— General mounting and boundary conditions</li> <li>— General measurement procedure</li> <li>— Data processing</li> <li>— Test report (general points)</li> </ul>
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.	<ul style="list-style-type: none"> <li>— Definitions of main quantities measured</li> <li>— General mounting and boundary conditions</li> <li>— General measurement procedure</li> <li>— Data processing</li> <li>— Test report (general points)</li> </ul>

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**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>

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# 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*

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*