

**Acoustics - Laboratory measurement of sound  
insulation of building elements - Part 2: Measurement of  
airborne sound insulation**

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## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 10140-2:2010 sisaldab Euroopa standardi EN ISO 10140-2:2010 ingliskeelset teksti.

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EUROPEAN STANDARD

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English Version

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

Acoustique - Mesurage en laboratoire de l'isolation acoustique des éléments de construction - Partie 2: Mesurage de l'isolation au bruit aérien (ISO 10140-2:2010)

Akustik - Messung der Schalldämmung von Gebäudeteilen im Prüfstand - Teil 2: Messung der Luftschalldämmung (ISO 10140-2:2008)

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## Foreword

This document (EN ISO 10140-2:2010) 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of an identical text or by endorsement, at the latest by March 2011, and conflicting national standards shall be withdrawn at the latest by March 2011.

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 20140-10:1992, EN ISO 140-6:1998, EN ISO 140-11:2005, EN ISO 140-8:1997, EN ISO 140-1:1997, EN ISO 140-16:2006, EN ISO 140-3:1995.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

### Endorsement notice

The text of ISO 10140-2:2010 has been approved by CEN as a EN ISO 10140-2:2010 without any modification.

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## Introduction

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

ISO 10140-1 specifies the application rules for specific elements and products, including specific requirements for preparation, mounting, operating and test conditions. This part of ISO 10140 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 ISO 10140-1, it is possible to apply this part of ISO 10140 and ISO 10140-3. ISO 10140-4 contains basic measurement techniques and processes. ISO 10140-5 contains 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 ISO 10140-1 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 are according to 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>
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 2: Measurement of airborne sound insulation

### 1 Scope

This part of ISO 10140 specifies a laboratory method for measuring the airborne sound insulation of building products, such as walls, floors, doors, windows, shutters, façade elements, façades, glazing, small technical elements, for instance transfer air devices, airing panels (ventilation panels), outdoor air intakes, electrical raceways, transit sealing systems and combinations, for example walls or floors with linings, suspended ceilings or floating floors.

The test results can be used to compare the sound insulation properties of building elements, classify elements according to their sound insulation capabilities, help design building products which require certain acoustic properties and estimate the *in situ* performance in complete buildings.

The measurements are performed in laboratory test facilities in which sound transmission via flanking paths is suppressed. The results of measurements made in accordance with this part of ISO 10140 are not applicable directly to the field situation without accounting for other factors affecting sound insulation, such as flanking transmission, boundary conditions and total loss factor.

### 2 Normative references

The following referenced documents are indispensable for the application 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 140-2, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 2: Determination, verification and application of precision data*

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

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

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

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