

**Akustika. Heliisolatsiooni mõõtmine  
hoonetes ja hooneosadel. Osa 5:  
Fassaadide ja fassaadiosade õhuheli  
isolatsiooni välimõõtmised**

Acoustics - Measurement of sound insulation in buildings and of building elements - Part 5: Field measurements of airborne sound insulation of façade elements and façades

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 140-5:1999 sisaldab Euroopa standardi EN ISO 140-5:1998 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 140-5:1999 consists of the English text of the European standard EN ISO 140-5:1998.</p> <p>This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> Standard määrab kindlaks kaks meetodisarja (elemendi- ja üldmeetodid) vastavalt fassaadiosade ja kogu fassaadi õhuheli isolatsiooni mõõtmiseks.</p>	<p><b>Scope:</b></p>
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**ICS** 91.120.20

**Võtmesõnad:** akustika, akustilised katsed, akustilised mõõtmised, fassaadid, heliisolatsioon, hooned, katsed, välikatsed, õhuheli

ICS 91.120.20

Descriptors: Acoustics, airborne sound insulation, testing.

**English version**

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 140-5 : 1998)**

Acoustique – Mesurage de l'isolation  
acoustique des immeubles et des élé-  
ments de construction – Partie 5:  
Mesurages in situ de la transmission  
des bruits aériens par les éléments de  
façade et les façades  
(ISO 140-5 : 1998)

Akustik – Messung der Schalldäm-  
mung in Gebäuden und von Bauteilen –  
Teil 5: Messung der Luftschall-  
dämmung von Fassadenelementen  
und Fassaden an Gebäuden  
(ISO 140-5 : 1998)

This European Standard was approved by CEN on 1998-08-14.

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 Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

International Standard

ISO 140-5 : 1998 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 5: Field measurements of airborne sound insulation of façade elements and façades,

which was prepared by ISO/TC 43 'Acoustic' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 126 'Acoustic properties of building products and of buildings', the Secretariat of which is held by AFNOR, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by February 1999 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 140-5 : 1998 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

## 1 Scope

This part of ISO 140 specifies two series of methods (element methods and global methods) for measurement of the airborne sound insulation of façade elements and whole façades, respectively. The element methods aim to estimate the sound reduction index of a façade element, for example a window. The most accurate element method uses a loudspeaker as an artificial sound source. Other, less accurate, element methods use available traffic noise. The global methods, on the other hand, aim to estimate the outdoor/indoor sound level difference under actual traffic conditions. The most accurate global methods use the actual traffic as sound source. In addition, a loudspeaker may be used as an artificial sound source. An overview of the methods is given in table 1.

The element loudspeaker method yields an apparent sound reduction index which, under certain circumstances [e.g. taking account of measurement precision (see 7.1)], can be compared with the sound reduction index measured in laboratories in accordance with ISO 140-3 or ISO 140-10. This method is the preferred method when the aim of the measurement is to evaluate the performance of a specified façade element in relation to its performance in the laboratory.

The element road traffic method will serve the same purposes as the element loudspeaker method. It is particularly useful when, for different practical reasons, the element loudspeaker method cannot be used. These two methods will often yield slightly different results. The road traffic method tends to result in lower values of the sound reduction index than the loudspeaker method. In annex D this road traffic method is supplemented by the corresponding aircraft and railway traffic methods.

The global road traffic method yields the real reduction of a façade in a given place relative to a position 2 m in front of the façade. This method is the preferred method when the aim of the measurement is to evaluate the performance of a whole façade, including all flanking paths, in a specified position relative to nearby roads. The result cannot be compared with that of laboratory measurements.

The global loudspeaker method yields the sound reduction of a façade relative to a position 2 m in front of the façade. This method is particularly useful when, for different practical reasons, the real noise source cannot be used. The result cannot be compared with that of laboratory measurements.

**Table 1 — Overview of the different measurement methods**

No.	Method	Reference	Result	Field of application
	<b>Element</b>			
1	Element loudspeaker	Clause 5	$R'_{45^\circ}$	Preferred method to estimate the apparent sound reduction index of façade elements
2	Element road traffic	Clause 6	$R'_{tr,s}$	Alternative to method No.1 when road traffic noise of sufficient level is available
3	Element railway traffic	Annex D (informative)	$R'_{rt,s}$	Alternative to method No.1 when railway traffic noise of sufficient level is available
4	Element air traffic	Annex D (informative)	$R'_{at,s}$	Alternative to method No.1 when air traffic noise of sufficient level is available
	<b>Global</b>			
5	Global loudspeaker	Clause 5	$D_{ls,2m,nT}$ $D_{ls,2m,n}$	Alternative to methods Nos. 6, 7 and 8
6	Global road traffic	Clause 6	$D_{tr,2m,nT}$ $D_{tr,2m,n}$	Preferred method to estimate the global sound insulation of a façade exposed to road traffic noise
7	Global railway traffic	Annex D (informative)	$D_{rt,2m,nT}$ $D_{rt,2m,n}$	Preferred method to estimate the global sound insulation of a façade exposed to railway traffic noise
8	Global air traffic	Annex D (informative)	$D_{at,2m,nT}$ $D_{at,2m,n}$	Preferred method to estimate the global sound insulation of a façade exposed to air traffic noise

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 140. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 140 are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below. Members of IEC and ISO maintain registers of currently valid international standards.

ISO 140-2:1991, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 2: Determination, verification and application of precision data.*

ISO 140-3:1995, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 3: Laboratory measurements of airborne sound insulation of building elements.*

ISO 354:1985, *Acoustics — Measurement of sound absorption in a reverberation room.*

ISO 717-1:1996, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation.*

IEC 60651:1979, *Sound level meters.*

IEC 60804:1985, *Integrating-averaging sound level meters.*

IEC 60942:1991, *Sound calibrators.*

IEC 61260:1995, *Electroacoustics — Octave band filters and fractional — Octave band filters.*