

Laboratory measurement of walking noise on floors

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 16205:2013+A1:2018 sisaldab Euroopa standardi EN 16205:2013+A1:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 16205:2013+A1:2018 consists of the English text of the European standard EN 16205:2013+A1:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 21.03.2018.	Date of Availability of the European standard is 21.03.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 91.120.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:  
Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

Laboratory measurement of walking noise on floors

Mesurage en laboratoire du bruit des pas sur les  
planchers

Messung von Gehschall auf Fußböden im Prüfstand

This European Standard was approved by CEN on 1 May 2013 and includes Amendment 1 approved by CEN on 12 February 2018.

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.

This European Standard exists 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

<b>Contents</b>	<b>Page</b>
<b>European foreword</b> .....	<b>3</b>
<b>Introduction</b> .....	<b>4</b>
<b>1 Scope</b> .....	<b>5</b>
<b>2 Normative references</b> .....	<b>5</b>
<b>3 Terms and definitions</b> .....	<b>5</b>
<b>4 Principle</b> .....	<b>7</b>
<b>5 Test arrangement</b> .....	<b>8</b>
5.1 Test facilities.....	8
5.2 Equipment .....	8
5.3 Mounting of the specimens.....	8
<b>6 Test procedure</b> .....	<b>8</b>
<b>7 Evaluation of results</b> .....	<b>9</b>
<b>8 Precision</b> .....	<b>9</b>
<b>9 Expression of results</b> .....	<b>9</b>
<b>10 Test report</b> .....	<b>10</b>
<b>Annex A (informative) Presentation of the walking noise spectrum with uncertainty bars (example)</b> .....	<b>11</b>
<b>Annex B (normative) Reference spectrum for laboratory bare floors</b> .....	<b>12</b>
<b>Annex C (informative) Fixing the pads below the tapping machine</b> .....	<b>13</b>
<b>Annex D (informative) Background of the measuring method</b> .....	<b>14</b>
<b>Annex E (informative) Calculation of perceived walking loudness on floor coverings installed floating</b> .....	<b>16</b>
E.1 General.....	16
E.2 Data measured .....	16
E.3 Calculations .....	16
E.3.1 Sound spectrum $L_{i,loud}$ .....	16
E.3.2 Loudness RWS .....	16
E.4 Test report.....	17
<b>Bibliography</b> .....	<b>18</b>

## European foreword

This document (EN 16205:2013+A1:2018) has been prepared by 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 September 2018, and conflicting national standards shall be withdrawn at the latest by September 2018.

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

This document includes Amendment 1 approved by CEN on 2018-02-12.

This document supersedes EN 16205:2013.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

This document sets up a laboratory measurement method to determine noise radiated from a floor covering on a standard concrete floor when excited by a standard tapping machine. The noise is measured in the room where the floor covering and the excitation are located. There is no restriction concerning the type of floor covering unless that the required small pads of the flooring could not be assembled. Using the standard tapping machine according to EN ISO 10140 means that a more general excitation compared to walking alone is regarded – in the same way as it is accepted for impact sound improvement measurements of floor coverings. The results are expressed in terms of the normalised A-weighted average sound pressure level in the walking room. The results provide information about the noise radiated. A more sophisticated psychoacoustic evaluation did not seem to be appropriate in view of the fact that this measurement stands for a large range of sources with different acoustical behaviour (even if only different types of walking were regarded). A subjective classification of the quality of the floor coverings is not intended.

## 1 Scope

This European Standard specifies a laboratory measurement method to determine noise radiated from a floor covering on a standard concrete floor when excited by a standard tapping machine.

## 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.

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

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

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

EN ISO 10140-4:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 4: Measurement procedures and requirements (ISO 10140-4:2010)*

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

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 10140 and the following apply.

### 3.1

#### **sufficiently large specimen**

specimen whose radiated sound power does not increase any longer with size, or which covers the total area of the floor

Note 1 to entry: In case of uncertainty the testing laboratory will decide, which size is sufficient.

### 3.2

#### **pads**

pieces of the flooring under test, which are as large as the hitting areas of the tapping machine hammers

Note 1 to entry: Quadratic pads should be the smallest possible including the whole hitting area.

### 3.3

#### **walking sound pressure level (in third-octave band $i$ )**

$L_{n,walk,i}$

normalised impact sound pressure level in the upper (walking) room with a standardised contribution of the concrete bare floor underneath the floor covering under test

Note 1 to entry: It is calculated according to Formula (1):