



# SLOVENSKI STANDARD SIST-TP CEN/TR 15226:2006

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**Gradbeni proizvodi - Podajanje akustičnih lastnosti v tehničnih specifikacijah proizvodov**

Building products - Treatment of acoustics in product technical specifications

Bauprodukte - Behandlung der Akustik in technischen Produktspezifikationen

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**CEN/TR 15226**

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## Building products - Treatment of acoustics in product technical specifications

Bauprodukte - Behandlung der Akustik in technischen Produktspezifikationen

This Technical Report was approved by CEN on 22 October 2005. It has been drawn up by the Technical Committee CEN/TC 126.

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## Foreword

This Technical Report (CEN/TR 15226:2006) has been prepared by Technical Committee CEN/TC 126 "Acoustic properties of building products and of buildings", the secretariat of which is held by AFNOR.

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.

In addition to using this document, it is recommended that product Technical Committees contact CEN/TC 126 for advice on acoustic issues relating to the treatment of acoustics in technical specifications.

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**CEN/TR 15226:2006 (E)****1 Scope**

This document specifies the technical requirements relating to acoustics for a product standard, European Technical Approval Guidelines (ETAG) or European Technical Approval (ETA) for a specific building product or equipment, or a family of building products or equipment. In particular, it gives advice on how to write requirements in response to the mandated characteristics on acoustics under the Construction Products Directive.

NOTE 1 In the remainder of this document, the terms used relate to CEN and product standards. The concepts are, however, equally applicable to the European Organisation for Technical Approvals (EOTA).

The purpose of this document is to assist the product Technical Committees in preparing acoustic clauses to ensure that such product standards:

- are as homogeneous as possible, with each individual product standard having the same basic structure;
- are in full accordance with the standards for the measurement of acoustic properties;
- reflect the latest technical knowledge of methods of determining the acoustical properties from the specific family of building products or equipment under consideration.

NOTE 2 Clause 2 lists the European and International Standards to be used in the drafting of acoustic provisions standard. Annex A contains an outline of a typical acoustic product standard summarizing the information that is required. Annex B contains guidance on choosing appropriate properties. Annex C describes the relevant measured acoustic properties for common products.

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**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.

**2.1 Standards for the measurement of acoustic properties**

EN 20140-9, *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 9: Laboratory measurements of room-to-room airborne sound insulation of a suspended ceiling with a plenum above it* (ISO 140-9:1985)

EN 29052-1, *Acoustics – Determination of dynamic stiffness – Part 1: Materials used under floating floors in dwellings* (ISO 9052-1:1989)

EN 29053, *Acoustics – Materials for acoustical applications – Determination of airflow resistance* (ISO 9053:1991)

EN ISO 140-3, *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurements of airborne sound insulation of building elements* (ISO 140-3:1995)

EN ISO 140-6, *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 6: Laboratory measurements of impact sound insulation of floors* (ISO 140-6:1998)

EN ISO 140-8, *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 8: Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor* (ISO 140-8:1997)

EN ISO 140-12, *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 12: Laboratory measurements of room-to-room airborne and impact sound insulation of an access floor* (ISO 140-12:2000)

EN ISO 354, *Acoustics – Measurement of sound absorption in a reverberation room* (ISO 354:2003)

EN ISO 717-1, *Acoustics – Rating the sound insulation in buildings and of building elements – Part 1: Airborne sound insulation* (ISO 717-1:1996)

EN ISO 717-2, *Acoustics – Rating the sound insulation in buildings and of building elements – Part 2: Impact sound insulation* (ISO 717-2:1996)

EN ISO 11654, *Acoustics – Sound absorbers for use in buildings – Rating of sound absorption* (ISO 11654:1997)

EN ISO 15186-1, *Acoustics – Measurement of sound insulation in buildings and of building elements using sound intensity – Part 1: Laboratory measurements* (ISO 15186-1:2000)

ISO 15186-3, *Acoustics – Measurement of sound insulation in buildings and of building elements using sound intensity – Part 3: Laboratory measurements at low frequencies*

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

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### 2.2 Standards for the estimation of acoustic properties

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EN 12354-1, *Building Acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 1: Airborne sound insulation between rooms* 2006

<https://standards.iteh.ai/catalog/standards/sist/009f020c-1804-4029-b439-35273d123007/sist-tp-cen-tr-15226-2006>

EN 12354-2:2000, *Building Acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 2: Impact sound insulation between rooms*

EN 12354-6:2003, *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 6: Sound absorption in enclosed spaces*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in the standards listed in Clause 2 and the following apply.

### 3.1 general

#### 3.1.1 equivalent continuous sound pressure level, $L_{eq,T}$ (dB)

value of the sound pressure level in decibels of a continuous, steady sound, that within a specified time interval,  $T$ , has the same mean squared sound pressure as the sound under consideration that varies with time

#### 3.1.2 octave band

band of frequencies in which the upper limit of the band is twice the frequency of the lower limit

**CEN/TR 15226:2006 (E)****3.1.3****one third octave band**

band of frequencies in which the upper limit of the band is  $2^{1/3}$  times the frequency of the lower limit

**3.2****airborne sound insulation****3.2.1****sound reduction index,  $R$  (dB)**

ten times the common logarithm of the ratio of the sound power  $W_1$  which is incident on a partition under test to the sound power  $W_2$  transmitted through the specimen, in a stated frequency band {laboratory measurement}

**3.2.2****sound reduction improvement index,  $\Delta R$  (dB)**

improvement in the sound reduction index due to a lining (e.g. wall lining, floating floor, ceiling etc) {laboratory measurement}

**3.2.3****apparent sound reduction index,  $R'$  (dB)**

ten times the common logarithm of the ratio of the sound power  $W_1$  which is incident on a partition under test to the total sound power transmitted into the receiving room, if in addition to the sound power  $W_2$  transmitted through the separating element, the sound power  $W_3$  transmitted through flanking elements or by other components is significant, in a stated frequency band {field measurement}

**3.2.4****intensity sound reduction index,  $R_I$  (dB)**

laboratory measurement of the sound reduction index using sound intensity measurements in a stated frequency band {laboratory measurement}

**3.2.5****level difference,  $D$  (dB)**

difference in the space and time average sound pressure levels produced in two rooms by one or more sound source in one of them in a stated frequency band

**3.2.6****normalized level difference,  $D_n$  (dB)**

level difference corresponding to the reference absorption area in the receiving room in a stated frequency band {field measurement}

**3.2.7****element-normalized level difference,  $D_{n,e}$  (dB)**

level difference corresponding to the reference absorption area in the receiving room in a stated frequency band for a small building element {laboratory measurement}

**3.2.8****standardized level difference,  $D_{nT}$  (dB)**

level difference in a stated frequency band, normalized to a reverberation time of 0,5 s {field measurement}

**3.2.9****suspended-ceiling normalized level difference  $D_{n,c}$  (dB)**

level difference corresponding to the reference absorption area in the receiving room in a stated frequency band for sound transmission via a suspended ceiling {laboratory measurement}



### 3.3 rating of airborne sound insulation

#### 3.3.1 C (dB)

spectrum adaptation term to be added to the single-number quantity to take account of spectrum No.1 as defined in EN ISO 717-1

#### 3.3.2 C<sub>tr</sub> (dB)

spectrum adaptation term to be added to the single-number quantity to take account of spectrum No.2 as defined in EN ISO 717-1

#### 3.3.3 weighted sound reduction index, $R_w$ (dB)

single-number quantity that characterizes the airborne sound insulation of a product or building element {laboratory measurement}

#### 3.3.4 weighted sound reduction improvement index, $\Delta R_w$ (dB)

single-number quantity that characterizes the improvement in the sound reduction index {laboratory measurement}

#### 3.3.5 weighted intensity sound reduction index, $R_{I,w}$ (dB)

single-number quantity that characterizes the airborne sound insulation of a product or building element over a range of frequencies using an intensity technique {laboratory measurement}

#### 3.3.6 weighted apparent sound reduction index, $R'_{w}$ (dB)

single-number quantity that characterizes the airborne sound insulation between rooms in a building {field measurement}

#### 3.3.7 weighted element-normalized level difference, $D_{n,e,w}$ (dB)

single-number quantity that characterizes the airborne sound insulation of a small building element over a range of frequencies {laboratory measurement}

#### 3.3.8 weighted standardized level difference, $D_{nT,w}$ (dB)

single-number quantity that characterizes the airborne sound insulation between rooms in a building {field measurement}

#### 3.3.9 weighted suspended-ceiling normalized level difference, $D_{n,c,w}$ (dB)

single-number quantity that characterizes the airborne sound insulation for sound transmission via a suspended ceiling over a range of frequencies {laboratory measurement}

### 3.4 impact sound insulation

#### 3.4.1 impact sound pressure level, $L_i$ (dB)

average sound pressure level in a specific frequency band in a room below a floor, when it is excited by a standard tapping machine in a stated frequency band

## CEN/TR 15226:2006 (E)

## 3.4.2

**normalized impact sound pressure level  $L_n$  (dB)**

impact sound pressure level normalized for a standard absorption area in the receiving room in a stated frequency band {laboratory measurement}

## 3.4.3

**reduction of impact sound pressure level,  $\Delta L$  (dB)**

difference between the average sound pressure levels in the receiving room in a stated frequency band before and after the installation of, for example, a floor covering {laboratory measurement}

## 3.4.4

**standardized impact sound pressure level,  $L'_{nT}$  (dB)**

impact sound pressure level standardized to a reverberation time in the receiving room of 0,5 s in a stated frequency band {field measurement}

## 3.4.5

**normalized flanking impact sound pressure level  $L_{n,f}$  (dB)**

impact sound pressure level corresponding to the reference absorption area in the receiving room in a stated frequency band for transmission via a specified flanking path {laboratory measurement}

## 3.5

**rating of impact sound insulation**

## 3.5.1

 **$C_1$  (dB)**

spectrum adaptation term to be added to the single-number quantity to take account of the un-weighted impact sound level as defined in EN ISO 717-2

## 3.5.2

**weighted normalized impact sound pressure level,  $L_{nw}$  (dB)**

single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies {laboratory measurement}

## 3.5.3

**weighted reduction in impact sound pressure level,  $\Delta L_w$  (dB)**

single-number quantity used to characterize the reduction in the impact sound pressure level {laboratory measurement}

## 3.5.4

**weighted standardized impact sound pressure level,  $L'_{nT,w}$  (dB)**

single-number-quantity used to characterize the impact sound insulation of floors over a range of frequencies in buildings {field measurement}

## 3.5.5

**weighted normalized flanking impact sound pressure level  $L_{n,f,w}$  (dB)**

single-number quantity used to characterize the impact sound insulation of floors for transmission via a specified flanking path over a range of frequencies {laboratory measurement}

## 3.6

**flanking transmission**

## 3.6.1

**vibration reduction index,  $K_{ij}$  (dB)**

quantity related to the vibrational power transmission over a junction between structural elements {laboratory measurement}

**3.6.2****normalized flanking level difference  $D_{n,f}$  (dB)**

level difference corresponding to the reference absorption area in the receiving room in a stated frequency band for sound transmission via a specified flanking path {laboratory measurement}

**3.7****rating of flanking transmission****3.7.1****vibration reduction index,  $K_{ij}$  (dB)**

single-number quantity that characterizes the vibration reduction index {laboratory measurement}

**3.7.2****weighted normalized flanking level difference  $D_{n,f,w}$  (dB)**

single-number quantity that characterizes the airborne sound insulation for sound transmission via a specified flanking path over a range of frequencies {laboratory measurement}

**3.8****sound absorption****3.8.1****equivalent sound absorption area of a room,  $A$  (m<sup>2</sup>)**

hypothetical area of a totally absorbing surface without diffraction effects which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration

**3.8.2****sound absorption area of an object  $A_{obj}$** 

difference between the equivalent sound absorption area of the reverberation room with and without the test object {laboratory measurement}

**3.8.3****sound absorption coefficient,  $\alpha_s$** 

change in equivalent sound absorption area after placing a test specimen in the reverberation room, divided by the area of the test specimen. It is only defined for a plane test specimen {laboratory measurement}

**3.8.4****sound absorption coefficient at normal incidence,  $\alpha$** 

ratio of sound power entering the surface of the test object (without return) to the incident sound power of a plane wave at normal incidence {laboratory measurement}

**3.9****rating of sound absorption****3.9.1****weighted sound absorption coefficient,  $\alpha_w$** 

single-number frequency-independent value which equals the value of the reference curve at 500 Hz after shifting it as specified in EN ISO 11654 {laboratory measurement}

**3.9.2****practical sound absorption coefficient,  $\alpha_p$** 

frequency-dependent value of the sound absorption coefficient which is based on measurements on one-third octave bands in accordance with EN ISO 354, and which is calculated in octave bands in accordance with EN ISO 11654 {laboratory measurement}

**CEN/TR 15226:2006 (E)****3.10  
acoustic performance of screens, enclosures and cabins****3.10.1  
in situ sound attenuation,  $D_p$  (dB)**

difference between the screened and unscreened sound pressure levels at defined positions {field measurement}

**3.10.2  
A-weighted in situ sound attenuation,  $D_{pA}$  (dB)**

difference between the screened and unscreened A-weighted sound pressure levels at defined positions {field measurement}

**3.10.3  
sound power insulation,  $D_W$  (dB)**

reduction in sound power level due to an enclosure {field/laboratory measurement}

**3.10.4  
A-weighted sound power insulation,  $D_{WA}$  (dB)**

reduction in A-weighted sound power level due to an enclosure for the actual sound source spectrum {field/laboratory measurement}

**3.10.5  
apparent A-weighted sound pressure insulation,  $D'_{pA}$  (dB)**

difference in A-weighted sound pressure levels measured in the room and in the cabin, respectively when the actual environmental noise is used as the sound source {field measurement}

**3.10.6  
apparent weighted sound pressure insulation,  $D'_{p,w}$  (dB)**

single-number value for the sound insulation of a cabin determined in accordance with the method stated in EN ISO 717-1 {field measurement}

**3.10.7  
weighted sound pressure insulation,  $D_{p,w}$  (dB)**

single-number value for the sound insulation of a cabin determined in accordance with the method stated in EN ISO 717-1 {laboratory measurement}

**3.11  
noise emission from appliances and equipment used in water supply installations****3.11.1  
appliance sound pressure level,  $L_{apn}$  (dB)**

sound pressure level for noise emission by an appliance {laboratory measurement}

**3.11.2  
appliance sound pressure level,  $L_{ap}$  (dB)**

A-weighted sound pressure level for noise emission by an appliance {laboratory measurement}

**3.12  
material and product properties**