

**Akustika. Kestade heliisolatsioonivõime
määramine. Osa 2: Mõõtmised in situ
(vastuvõtmiseks ja kontrollimiseks)**

Acoustics - Determination of sound insulation
performances of enclosures - Part 2: Measurements
in situ (for acceptance and verification purposes)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 11546-2:1999 sisaldab Euroopa standardi EN ISO 11546-2:1995 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 11546-2:1999 consists of the English text of the European standard EN ISO 11546-2:1995.</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>Käsitlusala:</p> <p>Standard esitab in situ-meetodid seadmekestade heliisolatsioonivõime (sissekanduva sumbuvuse) määramiseks. Standard kehtib üksnes kogu kesta kohta, mitte aga kesta eraldi koostepaneelide kohta.</p>	<p>Scope:</p>
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ICS 17.140.01

Võtmesõnad: akustika, akustilised katsed, akustilised mõõtmised, heliisolatsioon, katsed, kestad, mehhanismid, mootorimüra, müra (heli), müra vähendamine, tõhususkatsed, välikatsed

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Descriptors: Noise measurement, sound insulation, enclosures.

English version

Acoustics

Determination of sound insulation performances of enclosures

Part 2: Measurements in situ (for acceptance and verification purposes)
(ISO 11 546-2:1995)

Acoustique; détermination de l'isolement
acoustique des encoffrements. Partie 2:
Mesurages sur site (aux fins d'acceptation
et de vérification) (ISO 11 546-2:1995)

Akustik; Bestimmung der Schalldämmung
von Schallschutzkapseln. Teil 2: Messun-
gen im Einsatzfall (zum Zweck der Abnah-
me und Nachprüfung) (ISO 11 546-2:1995)

This European Standard was approved by CEN on 1995-08-18 and is identical to the ISO Standard as referred to.

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.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and 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 11546-2:1995 Acoustics; determination of sound insulation performances of enclosures; measurements in situ (for acceptance and verification purposes),

which was prepared by ISO/TC 43 'Acoustics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 211 'Acoustics' as a European Standard.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of the relevant EU Directives.

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 June 1996 at the latest.

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

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

Endorsement notice

The text of the International Standard ISO 11546-2:1995 was approved by CEN as a European Standard without any modification.

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

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1 Scope

This part of ISO 11546 specifies *in situ* methods for the determination of the sound insulation performance (insertion loss) of machine enclosures.

It applies to a total enclosure only and not to the individual panels from which the enclosure is made.

NOTES

1 Sound insulation for enclosure panels such as wall elements, doors, windows, silencers, etc. should be measured in accordance with other relevant standards.

2 Related standards concern noise-attenuation measurements of enclosures under laboratory conditions (ISO 11546-1) and cabins (ISO 11957).

The measurement methods specified in this part of ISO 11546 are based on International Standards in the series ISO 3740, ISO 9614 and ISO 11200 (see table 1). Depending on the method chosen, the sound insulation performance (insertion loss) of the enclosure is determined in terms of the reduction of sound power level or sound pressure level. Methods are given for measurements where the enclosure surrounds the actual sound source (machine). When these methods are not practicable, alternative measurements can be performed with an artificial sound source. Such methods are also described in this part of ISO 11546.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 11546. 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 11546 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 140-6:1978, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 6: Laboratory measurements of impact sound insulation of floors*.

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

ISO 3743-1:1994, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms*.

ISO 3744:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane*.

1) To be published. (Revision of ISO 717-1:1982 and ISO 717-3:1982)

ISO 3746:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane.*

ISO 3747:1987, *Acoustics — Determination of sound power levels of noise sources — Survey method using a reference sound source.*

ISO 4871:—²⁾, *Acoustics — Declaration and verification of noise emission values of machinery and equipment.*

ISO 9614-1:1993, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points.*

ISO 9614-2:—³⁾, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning.*

ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane.*

ISO 11202:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method in situ.*

ISO 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections.*

IEC 651:1979, *Sound level meters.*

IEC 804:1985, *Integrating-averaging sound level meters.*

IEC 942:1988, *Sound calibrators.*

IEC 1260:—⁴⁾, *Electroacoustics — Octave-band and fractional-octave-band filters.*

3 Definitions

For the purposes of this part of ISO 11546, the following definitions apply.

2) To be published. (Revision of ISO 4871:1984)

3) To be published.

4) To be published. (Revision of IEC 225:1966)

3.1 A-weighting: Frequency weighting as defined in IEC 651.

3.2 enclosure: A structure enveloping a noise source (machine), designed to protect the environment from this noise source (machine).

NOTE 3 An enclosure can be, for example, a freestanding structure terminated on the floor or a structure more or less fixed to the machine. (Concerning enclosures fixed to the machine, see clause 4.)

3.3 sound pressure level, L_p : Ten times the logarithm to the base 10 of the ratio of the square of the sound pressure of a sound to the square of the reference sound pressure. Sound pressure levels are expressed in decibels. The reference sound pressure is 20 μ Pa (2×10^{-5} Pa).

3.4 average sound pressure level, \bar{L}_p : Mean-square of the sound pressure levels:

$$\bar{L}_p = 10 \lg \left(\frac{10^{0,1L_{p1}} + 10^{0,1L_{p2}} + \dots + 10^{0,1L_{pn}}}{n} \right) \text{ dB}$$

where $L_{p1}, L_{p2}, \dots, L_{pn}$ are the sound pressure levels, in decibels, to be averaged.

3.5 sound power level, L_w : Ten times the logarithm to the base 10 of the ratio of a given sound power to the reference sound power. It is expressed in decibels. The reference sound power is 1 pW (10^{-12} W).

3.6 average sound power level, \bar{L}_w : Mean-square of the sound power levels:

$$\bar{L}_w = 10 \lg \left(\frac{10^{0,1L_{w1}} + 10^{0,1L_{w2}} + \dots + 10^{0,1L_{wn}}}{n} \right) \text{ dB}$$

where $L_{w1}, L_{w2}, \dots, L_{wn}$ are the sound power levels, in decibels, to be averaged.

3.7 sound power insulation, D_w : Reduction in sound power level obtained due to the enclosure (octave bands or one-third octave bands). It is expressed in decibels.

3.8 A-weighted sound power insulation, D_{wA} : Reduction in the A-weighted sound power level obtained due to the enclosure for the actual sound source spectrum. It is expressed in decibels.

3.9 sound pressure insulation, D_p : Reduction in the sound pressure level at a specified position due to the