

**Akustika. Kestade heliisolatsioonivõime
määramine. Osa 1: Mõõtmine
laboritingimustes (deklareerimiseks)**

Acoustics - Determination of sound insulation performances of enclosures - Part 1: Measurements under laboratory conditions (for declaration purposes)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 11546-1:1999 sisaldab Euroopa standardi EN ISO 11546-1:1995 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 11546-1:1999 consists of the English text of the European standard EN ISO 11546-1:1995.</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 laborimeetodid väikeseadmete kestade heliisolatsioonivõime (sissekanduva sumbuuse) 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, laborikatsed, mehhanismid, mootorimüra, müra (heli), müra vähendamine, tõhususkatsed

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Descriptors: Noise measurement, sound insulation, enclosures.

English version

Acoustics

Determination of sound insulation performances of enclosures

Part 1: Measurements under laboratory conditions (for declaration purposes)
(ISO 11 546-1:1995)

Acoustique; détermination de l'isolement
acoustique des encoffrements. Partie 1:
Mesurages dans des conditions de
laboratoire (aux fins de déclaration)
(ISO 11 546-1:1995)

Akustik; Bestimmung der Schalldämmung
von Schallschutzkapseln. Teil 1: Messun-
gen unter Laborbedingungen (zum Zweck
der Kennzeichnung) (ISO 11 546-1:1995)

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

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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.

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CEN

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

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Foreword

International Standard

ISO 11546-1:1995 Acoustics; determination of sound insulation performances of enclosures; measurements under laboratory conditions (for declaration 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 11546-1:1995 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 laboratory methods for the determination of the sound insulation performance (insertion loss) of small 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 *in situ* (ISO 11546-2) 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). Where these methods are not practicable, alternative measurements can be performed using a reciprocity method (see definition 3.11 and subclause 7.2) or an artificial sound source.

This part of ISO 11546 is applicable without any restrictions to freestanding enclosures with volumes less than 2 m³. If the actual sound source is used, the sound insulation performance of enclosures with volumes exceeding 2 m³ can be determined provided that the requirements concerning maximum permissible volume in the standard used are fulfilled. The actual sound source method is applicable for any kind of enclosure design, for example enclosures fixed to the machine.

When the reciprocity method or the artificial sound source method is used, the maximum volume of the enclosure is limited to 2 m³. These methods are not applicable to close-fitting enclosures.

The wording "laboratory conditions" used in the title of this part of ISO 11546 indicates that test conditions and test environment (indoor or outdoor) fully conform to the respective International Standards given in table 1.

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 3741:1988, *Acoustics — Determination of sound power levels of noise sources — Precision methods for broad-band sources in reverberation rooms.*

ISO 3742:1988, *Acoustics — Determination of sound power levels of noise sources — Precision methods for discrete-frequency and narrow-band sources in reverberation rooms.*

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 3743-2:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 2: Methods for special reverberation 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.*

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 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.

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 μPa (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.

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

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

3) To be published.

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