

**Akustika. Audiomeetrilised katsemeetodid. Osa
1: Puhastooni õhujuhte- ja luujuhteläve
audiomeetriline põhimõõtmine**

Acoustics - Audiometric test methods - Part 1: Basic
pure tone air and bone conduction threshold
audiometry

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 8253-1:1999 sisaldab Euroopa standardi EN ISO 8253-1:1998 ingliskeelset teksti.

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This Estonian standard EVS-EN ISO 8253-1:1999 consists of the English text of the European standard EN ISO 8253-1:1998.

This standard is ratified with the order of Estonian Centre for Standardisation dated 12.12.1999 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

ICS 13.140

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Descriptors: See ISO document

English version

**Acoustics - Audiometric test methods - Part 1: Basic pure tone
air and bone conduction threshold audiometry (ISO 8253-
1:1989)**

Acoustique - Méthodes d'essais audiométriques - Partie 1:
Audiométrie liminaire fondamentale à sons purs en
conduction aérienne et en conduction osseuse (ISO 8253-
1:1989)

Akustik - Audiometrische Prüfverfahren - Teil 1:
Grundlegende Verfahren der Luft- und Knochenleitungs-
Schwellenaudiometrie mit reinen Tönen (ISO 8253-1:1989)

This European Standard was approved by CEN on 31 January 1998.

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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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

The text of the International Standard from Technical Committee ISO/TC 43 "Acoustics" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 211 "Acoustics", the secretariat of which is held by DS.

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 August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 8253-1:1989 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

Annex ZA (normative)
Normative references to international publications
with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 389	1991	Acoustics - Standard reference zero for the calibration of pure-tone air conduction audiometers	EN ISO 389	1995

INTERNATIONAL STANDARD

ISO
8253-1

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Acoustics — Audiometric test methods —

Part 1:

Basic pure tone air and bone conduction threshold
audiometry

Acoustique — Méthodes d'essais audiométriques —

*Partie 1: Audiométrie liminaire fondamentale à sons purs en conduction aérienne et
en conduction osseuse*



Reference number
ISO 8253-1 : 1989 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8253-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*.

ISO 8253 will consist of the following parts, under the general title *Acoustics — Audiometric test methods*:

- *Part 1: Basic pure tone air and bone conduction threshold audiometry*
- *Part 2: Sound field audiometry with pure tone and narrow-band signals*

Annex A of this part of ISO 8253 is for information only.

Introduction

This International Standard lays down requirements and procedures for carrying out basic audiometric tests in which pure tones are presented to the test subject using earphones or bone vibrators. Electrophysiological test methods are not included. Procedures for air conduction threshold audiometry for hearing conservation purposes are given in ISO 6189. Where appropriate, both International Standards have been brought into line with one another.

In order to obtain a reliable measure of hearing ability, many factors are involved. IEC 645 specifies requirements for audiometers. It is essential that audiometric equipment, when in service, be checked and the calibration maintained. This part of ISO 8253 outlines a calibration scheme. To avoid masking of the test signal by ambient noise in the audiometric test room, the levels of the ambient noise shall not exceed certain values, depending upon the method of signal presentation to the test subject, i.e. by earphone or by bone vibrator. This part of ISO 8253 gives maximum permissible ambient sound pressure levels which shall not be exceeded when hearing threshold levels down to 0 dB have to be measured. It indicates the maximum ambient sound pressure levels which are permissible when other minimum hearing threshold levels have to be measured. It sets out procedures for determining hearing threshold levels by pure tone air conduction and bone conduction audiometry. For screening purposes, only methods for air conduction audiometry are outlined.

Audiometry can be performed by using

- a) a manual audiometer;
- b) an automatic recording audiometer;
- c) computer-controlled audiometric equipment.

Methods for threshold audiometry are given for these three types of signal presentation. For screening purposes, only methods using a manual or a computer controlled audiometer are set out.

The procedures are applicable to the majority of adults and children. Other procedures may yield results equivalent to those derived by the procedures specified in this part of ISO 8253. For very young, aged or sick people, some modification of the recommended procedures is likely to be required. This may result in a less accurate measurement of hearing.

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Acoustics — Audiometric test methods —

Part 1:

Basic pure tone air and bone conduction threshold audiometry

1 Scope

This part of ISO 8253 specifies procedures and requirements for air conduction and bone conduction threshold audiometry. For screening purposes, only air conduction pure tone audiometric test methods are described. The procedures may not be appropriate for special populations, for example very young children.

Some audiometric procedures need to be carried out at levels above the hearing threshold levels of the subjects. These and other tests are not described in this part of ISO 8253.

Procedures and requirements for speech audiometry, electrophysiological audiometry, and where loudspeakers are used as a sound source are not specified. Air conduction threshold audiometry for hearing conservation purposes is described in ISO 6189.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8253. 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 8253 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 389 : 1985, *Acoustics — Standard reference zero for the calibration of pure tone air conduction audiometers.*

ISO 7566 : 1987, *Acoustics — Standard reference zero for the calibration of pure-tone bone conduction audiometers.*

IEC 225 : 1966, *Octave, half-octave and third-octave band filters intended for the analysis of sounds and vibrations.*

IEC 303 : 1970, *IEC provisional reference coupler for the calibration of earphones used in audiometry.*

IEC 318 : 1970, *An IEC artificial ear, of the wideband type, for the calibration of earphones used in audiometry.*

IEC 373 : 1971, *An IEC mechanical coupler for the calibration of bone vibrators having a specified contact area and being applied with a specified static force.*

IEC 645 : 1979, *Audiometers.*

IEC 651 : 1979, *Sound level meters.*

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

3 Definitions

For the purposes of this part of ISO 8253, the following definitions apply.

3.1 air conduction: The transmission of sound through the outer and middle ear to the inner ear.

3.2 acoustic coupler: A cavity of specified shape and volume which is used for the calibration of an earphone in conjunction with a calibrated microphone to measure the sound pressure developed within the cavity.

NOTE — An acoustic coupler is specified in IEC 303.

3.3 artificial ear: A device for the calibration of an earphone which presents to the earphone an acoustic impedance equivalent to the impedance presented by the average human ear. It is equipped with a calibrated microphone for the measurement of the sound pressure developed by the earphone.

NOTE — An artificial ear is specified in IEC 318.

3.4 bone conduction: The transmission of sound to the inner ear primarily by means of mechanical vibration of the cranial bones.

3.5 bone vibrator: An electromechanical transducer intended to produce the sensation of hearing by vibrating the cranial bones.