

**Akustika. Kuulmiskaitsevahendid. Osa 1:  
Subjektiivne meetod helisummutuse  
mõõtmiseks**

Acoustics - Hearing protectors - Part 1: Subjective  
method for the measurement of sound attenuation

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 24869-1:1999 sisaldab Euroopa standardi EN 24869-1:1992 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 23.11.1999 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 24869-1:1999 consists of the English text of the European standard EN 24869-1:1992.

This standard is ratified with the order of Estonian Centre for Standardisation dated 23.11.1999 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.

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1 EUROPEAN STANDARD

EN 24869-1:1992

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Descriptors: Acoustics, ear protectors, acoustic measurement, noise reduction

English version

**Acoustics - Hearing protectors - Subjective method  
for the measurement of sound attenuation (ISO  
4869-1:1990)**

Acoustique - Protecteurs individuels contre le  
bruit - Méthode subjective de mesure de  
l'affaiblissement acoustique (ISO 4869-1:1990)

Akustik - Gehörschützer - Subjektive Methode  
zur Messung der Schalldämmung (ISO 4869-1:1990)

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**CEN**

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

### Foreword

This European Standard is the endorsement of ISO 4869-1. Endorsement of ISO 4869-1 was recommended by Technical Committee CEN/TC 241 "Acoustics" under whose competence this European Standard will henceforth fall.

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of an identical text or by endorsement, at the latest by April 1993, and conflicting national standards shall be withdrawn at the latest by April 1993.

The Standard was approved and 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, United Kingdom.

### Endorsement notice

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# INTERNATIONAL STANDARD

**ISO**  
**4869-1**

First edition  
1990-12-15

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## **Acoustics — Hearing protectors —**

### **Part 1:**

Subjective method for the measurement of sound  
attenuation

*Acoustique — Protecteurs individuels contre le bruit —*

*Partie 1: Méthode subjective de mesurage de l'affaiblissement  
acoustique*



Reference number  
ISO 4869-1:1990(E)

## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4869-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*.

This first edition of ISO 4869-1 cancels and replaces ISO 4869:1981, of which it constitutes a technical revision.

ISO 4869 consists of the following parts, under the general title *Acoustics — Hearing protectors*:

- *Part 1: Subjective method for the measurement of sound attenuation*
- *Part 2: Estimated noise reduction of hearing protectors*
- *Part 3: Simplified method for the measurement of insertion loss of ear-muff type protectors for quality inspection purposes*  
[Technical Report]

Annexes A and B of this part of ISO 4869 are for information only.

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## Introduction

Hearing protectors are commonly used to reduce the noise to which the ear is exposed. Hearing protectors are manufactured as ear-plugs, ear-muffs or helmets. A standardized method of sound attenuation measurement allows performance data obtained in different locations under similar conditions to be compared. The data may be used for rank ordering and selection of different models and the evaluation of design and construction features that affect performance.

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## Acoustics — Hearing protectors —

### Part 1:

### Subjective method for the measurement of sound attenuation

#### 1 Scope

This International Standard specifies a subjective method for measuring sound attenuation of hearing protectors at the threshold of hearing. The method and procedures are designed to yield values close to the maximum attenuation which are not normally attained under field conditions. This approach has been adopted because the attenuation values can then be consistently reproduced. The values reflect the attenuating characteristics of the hearing protector only to the extent that users wear the device in the same manner as did the test subjects.

This test method yields data which are collected at low sound pressure levels (close to the threshold of hearing) but which are also representative of the attenuation values of hearing protectors at higher sound pressure levels. An exception occurs in the case of amplitude-sensitive hearing protectors for sound pressure levels above the point at which their level-dependent characteristics become effective. At those sound pressure levels the method specified in this International Standard is inapplicable; it will usually underestimate sound attenuation for these devices.

**NOTE 1** At low frequencies (below 500 Hz) the sound attenuation may be overestimated by a few decibels as a result of masking the occluded ear thresholds caused by physiological noise during the occluded ear tests.

#### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 4869. 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 4869 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 354:1985, *Acoustics — Measurement of sound absorption in a reverberation room*.

ISO 8253-2:—<sup>1)</sup>, *Acoustics — Audiometric test methods — Part 2: Sound field audiometry with pure tone and narrow-band test signals*.

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

IEC 263:1982, *Scales and sizes for plotting frequency characteristics and polar diagrams*.

IEC 645-1:—<sup>2)</sup>, *Audiometers — Part 1: Pure tone 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 4869, the following definitions apply.

**3.1 hearing protector:** A device worn by a person to prevent unwanted auditory effects from acoustic stimuli.

1) To be published.

2) To be published. (Revision of IEC 645:1979.)