EESTI STANDARD EVS-EN 24869-3:1999

Akustika. Kuulmiskaitsevahendid. Osa 3: Kvaliteedi kontrollimise eesmärgil teostatav lihtsustatud meetod polstri tüüpi kuulmiskaitsevahendite sissekanduva sumbuvuse mõõtmiseks

Acoustics - Hearing protectors - Part 3: Simplified method for the measurement of insertion loss of ear-muff type protectors for quality inspection purposes

EESTI STANDARDIKESKUS

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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 24869-3:1999 sisaldab Euroopa standardi EN 24869-3:1993 ingliskeelset teksti. Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 24869-3:1999 consists of the English text of the European standard EN 24869-3:1993. This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Standard määrab kindlaks kvaliteedi kontrollimiseks kohaldatava meetodi kõrvapolstri tüüpi kuulmiskaitsevahendite sissekanduva sumbuvuse mõõtmiseks.	**Scope:**

ICS 13.340.20

Võtmesõnad: akustika, akustilised testid, kaitsevahendid, kuulmiskaitsevahendid, kvaliteedi kontrollimine, testid

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Descriptors: Acoustics, hearing protectors, ear muffs, acoustic measurement, noise reduction, acoustic tests, quality control, noise, sound pressure.

English version

Acoustics

Hearing protectors

Part 3: Simplified method for the measurement of insertion loss of ear-muff type protectors for quality inspection purposes (ISO/TR 4869-3:1989)

Acoustique; protecteurs individuels contre le bruit. Partie 3: Méthode simplifiée de mesurage de l'affaiblissement acoustique des protecteurs du type serre-tête, destinée aux contrôles de qualité (ISO/TR 4869-3:1989)

Akustik; Gehörschützer. Teil 3: Vereinfachtes Verfahren zur Messung der Schalldämmung von Kapselgehörschützern zum Zweck der Qualitätsprüfung (ISO/TR 4869-3:1989)

This European Standard was approved by CEN on 1993-11-25 and is identical to the Technical Report 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

This European Standard has been taken over by CEN/TC 211 'Acoustics' from the work of ISO/TC 43 'Acoustics' of the International Organization for Standardization (ISO).

In 1993, CEN/TC 211 decided to submit Technical Report

ISO/TR 4869-3:1989 Acoustics; hearing protectors; simplified method for the measurement of insertion loss of ear-muff type protectors for quality inspection purposes

to the Unique Acceptance Procedure.

The result was positive.

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 May 1994 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 Technical Report ISO/TR 4869-3:1989 was approved by CEN as a European Standard without any modification.

Introduction

During the preparation of ISO 4869 : 1981, *Acoustics — Measurement of sound attenuation of hearing protectors — Subjective method*, the document contained at a certain time both a subjective and a purely physical measurement method. Based on member body comments it was decided to split up the two methods in separate documents, giving priority to the subjective method which was issued in 1981 as ISO 4869. A first draft proposal for the physical method, document 43/1 N 367, was circulated to ISO/TC 43/SC 1 member bodies for comments in the period 1978-12-15 to 1979-03-15 for presentation at the SC 1 meeting in May 1979 in Stockholm, Sweden, where a second draft proposal, document 43/1 N 390, was approved for DIS-circulation subject to amendments in response to comments made at the meeting. ISO/DIS 6290 was circulated for voting amongst all ISO member bodies in the period 1983-01-06 to 1983-07-06. Upon recommendation from Working Group 17, the plenary SC 1 meeeting in April 1985 in Budapest, Hungary, approved that an amended text be submitted to ISO/TC 43 member bodies for adoption as a technical report. Such a proposal for a technical report was circulated for voting amongst ISO/TC 43 member bodies as document 43 N 749 in the period 1986-12-15 to 1987-01-20 with the following result: 12 approvals, 1 disapproval and 1 abstention.

A subjective method for the measurement of the sound attenuation of hearing protectors is given in ISO 4869-1. In order to describe a simplified method for the measurement of the insertion loss using an objective method for production control and certification applications, an acoustic test fixture as specified in this Technical Report has been developed with the aim of achieving a simple but reproducible method of measurement.

The acoustic test fixture was tested in a round robin test including hearing protectors of the ear-muff type tested at some laboratories (Germany, F.R., Sweden, UK). The results were encouraging.

The new testing method has been used in two independent international round robin tests within the EEC and in the Nordic countries.

The reproducibility of the results from these tests is, however, not satisfactory. The major reasons for the deviations observed cannot be fully explained at present. There is a need for further experiments with the acoustic test fixture in order to clarify the reasons for the deviations in the results.

In order to allow gathering of data and experience with this device to provide a background for resolving the present problems and for issuing an International Standard within a few years, it has been decided to publish a description of the test fixture and of the measurement procedure presented in ISO/DIS 6290 — revised in response to comments submitted during the DIS-voting — in the form of a technical report, under number ISO/TR 4869-3.

The method specified in this Technical Report does not provide results which are the same as those obtained by the subjective method because of the requirements for simplicity and reproducibility of test results and other more basic considerations.

The test fixture specified in this Technical Report is not intended to supplant those dummy heads which include simulation of various anatomical features and which are used, for example, for development testing purposes.

1 Scope

This Technical Report specifies a method for measuring the insertion loss of ear-muff type hearing protectors for quality inspection purposes. The method may also be used to investigate production spreads of performance as part of type approval or certification procedures and to investigate the change of performance with age.

A measurement of application force is specified because the force affects acoustic performance.

The method specified in this Technical Report is not intended to be used as the basic test for type approval purposes. Performance data obtained by this method are not to be quoted as representing the real-ear sound attenuation of an ear-muff, nor the protection provided by the ear-muff.

NOTES

1 A further application of the method is its use to ensure that ear-muff hearing protector samples submitted for subjective testing of attenuation according to ISO 4869-1 have performance typical of the type.

2 For the testing of certain ear-muffs such as those attached to safety helmets, or those with contoured ear-cups or ear-cushions, the procedure described in this Technical Report may have to be slightly modified.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Technical Report. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Technical Report 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 48 : 1979, *Vulcanized rubbers — Determination of hardness (Hardness between* 30 *and* 85 IRHD*).*

ISO 4869-1 : — [1], *Acoustics — Hearing protectors — Part 1: Subjective method for the measurement of sound attenuation.*

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

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

IEC 50(801) : 1984, *International Electrotechnical Vocabulary. Chapter 801: Acoustics and electro-acoustics. Section 1: General terms.*

3 Definitions

For the purposes of this Technical Report, the following definitions apply.

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

3.2 ear-muff: A hearing protector consisting of an ear-cup to be pressed against each pinna or of a circumaural ear-cup to be pressed against the head around the pinna. The ear-cups can be pressed against the head with a special headband or neck-band or by means of a device attached to a safety helmet or other equipment.

3.3 headstrap: A flexible strap fitted to each cup, or to the headband close to the cup. It may be adjusted to support the ear-muffs, usually behind-the-head types, by resting on the top of the head.

3.4 acoustic test fixture: A device that approximates certain dimensions of an average adult human head and is used, for the purposes of this Technical Report, for measuring the insertion loss of hearing protectors of ear-muff type. For this purpose, it includes a microphone arrangement for measuring sound pressure levels.

3.5 insertion loss: The algebraic difference, in decibels, between the one-third octave band pressure level measured by

1) To be published. (Revision of ISO 4869 : 1981.)