



SLOVENSKI STANDARD
oSIST prEN 13819-3:2017

01-februar-2017

Varovala sluha - Preskušanje - 3. del: Dodatna akustična preskusna metoda

Hearing protectors - Testing - Part 3: Supplementary acoustic test method

Gehörschützer - Prüfung - Teil 3: Zusätzliche akustische Prüfverfahren

Protecteurs individuels contre le bruit - Essais - Partie 3 : Méthodes d'essais
acoustiques supplémentaires

Ta slovenski standard je istoveten z: prEN 13819-3

ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

oSIST prEN 13819-3:2017

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 13819-3

December 2016

ICS 13.340.20

English Version

Hearing protectors - Testing - Part 3: Supplementary acoustic test method

Protecteurs individuels contre le bruit - Essais - Partie
3 : Méthodes d'essais acoustiques supplémentaires

Gehörschutzer - Prüfung - Teil 3: Zusätzliche
akustische Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 159.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents		Page
European foreword.....		3
Introduction		4
1	Scope.....	5
2	Normative references.....	5
3	Terms and definitions	5
4	Symbols and abbreviations	7
5	Acoustic Test Method.....	7
5.1	Conditioning and testing atmosphere	7
5.2	Occluded-ear simulator	7
5.3	Occluded-ear simulator built into an acoustic test fixture	7
5.4	Microphone in Real Ear (MIRE).....	7
6	Test signals.....	8
6.1	HML test sounds.....	8
6.2	Broadband noise (pink noise) test sound.....	8
6.3	Speech signal.....	8
6.4	Entertainment audio test signal	9
7	Test procedures.....	9
7.1	Level dependent hearing protectors.....	9
7.1.1	Earmuff with electronic level dependent feature	9
7.1.2	Earplug with electronic level dependent feature	10
7.2	Active noise reduction (ANR) hearing protectors.....	12
7.2.1	Earmuff with active noise reduction	12
7.3	FM Radio.....	14
7.3.1	Earmuff	14
7.3.2	Ear plug.....	15
7.4	Bluetooth™	16
7.4.1	Earmuff	16
7.4.2	Earplug.....	18
7.5	Electrical audio input.....	21
7.5.1	Earmuff	21
7.5.2	Earplug.....	23
Annex A (informative) Overview of Supplementary Acoustic test methods		25
Annex B (normative) HML Signal and pink noise with $L_A = 100$ dB and tolerances.....		26
Annex C (informative) Calculation examples for level dependent hearing protectors - earmuffs.....		28
Annex D (informative) Calculation examples for ANR.....		30
Bibliography.....		31

European foreword

This document (prEN 13819-3:2016) has been prepared by Technical Committee CEN/TC 159 "Hearing protectors", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association

This document is a draft under development by CEN/TC 159/WG 2 *Electronic and amplitude sensitive hearing protectors*.

Introduction

This standard is part of a set of standards for personal hearing protectors.

The EN 13819 series consists of three parts and deals with testing plans of hearing protectors.

- *Part 1: Physical test methods*
- *Part 2: Acoustic test methods*
- *Part 3: Supplementary acoustic test methods*

EN 13819-1 and EN 13819-2 deal with testing common to all types of hearing protectors. An overview of the supplementary test methods of this standard and the relative hearing protector they are used for is reported in Annex A.

The EN 352 series addresses product requirements. EN 352-1 deals with requirements for earmuffs, EN 352-2 for earplugs and EN 352-3 for earmuffs attached to industrial safety helmets. Safety requirements for level-dependent earmuffs are contained in EN 352-4, for earmuffs with active noise reduction in EN 352-5, for earmuffs with electrical audio input facility in EN 352-6, for level-dependent earplugs in EN 352-7, for entertainment audio earmuffs in EN 352-8, for earplugs with electrical audio input in prEN 352-9 and for earplugs with entertainment audio input in prEN 352-10.

An associated standard, EN 458, covers selection, use, care and maintenance of hearing protectors.

1 Scope

This European Standard specifies supplementary acoustic test methods for hearing protectors. The purpose of these tests is to enable assessment of the hearing protector performance as specified in the appropriate product standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 24869-1:1992, *Acoustics - Hearing protectors - Subjective method for the measurement of sound attenuation (ISO 4869-1:1990)*

EN 60318-4:2010, *Electroacoustics - Simulators of human head and ear - Part 4: Occluded-ear simulator for the measurement of earphones coupled to the ear by means of ear inserts (IEC 60318-4:2010)*

EN ISO 4869-2:1995, *Acoustics - Hearing protectors - Part 2: Estimation of effective A-weighted sound pressure levels when hearing protectors are worn (ISO 4869-2:1994)*

EN ISO 11904-1:2002, *Acoustics - Determination of sound immission from sound sources placed close to the ear - Part 1: Technique using a microphone in a real ear (MIRE technique) (ISO 11904-1:2002)*

EN ISO 11904-2:2004, *Acoustics - Determination of sound immission from sound sources placed close to the ear - Part 2: Technique using a manikin (ISO 11904-2:2004)*

ITU-T P.50:1998, *SERIES P: TELEPHONE TRANSMISSION QUALITY, TELEPHONE INSTALLATIONS, LOCAL LINE NETWORKS, Objective measuring apparatus, Artificial voices. Appendix I: Test signals*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

hearing protector

device that can be an earmuff or an earplug

3.2

ear simulator

device for measuring the acoustic output of sound sources where the sound pressure is measured by a calibrated microphone coupled to the source so that the overall acoustic impedance of the device approximates that of the normal human ear at a given location and in a given frequency band

[SOURCE: EN 60318-4:2010, 3.4]

3.3

occluded-ear simulator

ear simulator which approximates the acoustic transfer impedance of the inner part of the ear canal, from the tip of an ear insert to the eardrum

[SOURCE: EN 60318-4:2010, 3.5]

Note 1 to entry: The standard EN 60318-4 replaced IEC 60711.

prEN 13819-3:2016 (E)**3.4****insertion loss**

algebraic difference in decibels between the one-third octave band sound pressure level, measured by the microphone of the acoustic test fixture with the hearing protector absent, and the sound pressure level with the hearing protector present

[SOURCE: EN ISO 4869-3:2007, 3.7]

3.5**sound attenuation**

difference, in decibels, between the threshold of hearing with and without the hearing protector in place for a test subjects, for a given test signal

[SOURCE: EN 24869-1:1992, 3.8]

3.6**reference point**

fixed spatial location within the test chamber at which the midpoint of a line connecting the test subject's or ATF's ear canal openings is located for MIRE or ATF measurements, and likewise the point to which all objective measurements of the sound field characteristics are referenced

3.7**acoustic test fixture****ATF**

device that approximates certain dimensions of an average adult human head

[SOURCE: EN ISO 4869-3:2007, 3.4]

3.8**head simulator**

acoustic test fixture with an occluded ear simulator

3.9**level-dependent hearing protector**

hearing protector designed to provide restoration of external sounds, while providing attenuation of sounds at high levels

3.10**active noise reduction hearing protectors**

hearing protectors designed to provide additional attenuation of external sounds by means of a noise cancellation circuit

3.11**hearing protector with electrical audio input**

hearing protector designed to provide speech information and warning signals, while providing attenuation of sounds in excess of limit levels

3.12**entertainment audio hearing protector**

hearing protector designed to provide not only sound attenuation to ambient sound but also to provide entertainment audio via built-in loudspeakers