SLOVENSKI STANDARD
SIST EN 352-8:2008

01-julij-2008

Varovala sluha - Varnostne zahteve in preskuġanje - 8. del: Nauġniki za razvedrilni zvoļ ni signal

Hearing protectors - Safety requirements and testing - Part 8: Entertainment audio ear-muffs

Gehörschützer - Sicherheitstechnische Anforderungen und Prüfungen - Teil 8: Audiokapselgehörschützer für Unterhaltungszwecke

Protecteurs individuels contre le bruit - Exigences de sécurité et essais - Partie 8 : Serre-tete audio de divertissement

Ta slovenski standard je istoveten z: **EN 352-8:2008**

ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

SIST EN 352-8:2008 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 352-8

April 2008

ICS 13.340.20

English Version

Hearing protectors - Safety requirements and testing - Part 8: Entertainment audio ear-muffs

Protecteurs individuels contre le bruit - Exigences de sécurité et essais - Partie 8 : Serre-tête audio de divertissement

Gehörschützer - Sicherheitstechnische Anforderungen und Prüfungen - Teil 8: Audiokapselgehörschützer für Unterhaltungszwecke

This European Standard was approved by CEN on 21 March 2008.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

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

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword

This document (EN 352-8:2008) has been prepared by Technical Committee CEN/TC 159 “Hearing protectors”, the secretariat of which is held by DIN.

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 October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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

Introduction

This European Standard "Hearing Protectors – Safety requirements and testing – Part 8: Entertainment audio ear-muffs", specifies procedures for the testing of personal hearing protection devices in relation to Directive 89/686/EEC - Personal Protective Equipment. Entertainment audio ear-muffs provide hearing protection for the user but also provide a music or speech signal for entertainment purposes rather than for audio communications associated with the work duties of the wearer.

EN 352-1 deals with requirements for ear-muffs, EN 352-2 with ear-plugs, EN 352-3 with ear-muffs attached to industrial safety helmets. EN 13819 parts 1 and 2 deal with testing plans common to all types of hearing protectors covered by this series of European Standards.

Additional safety requirements and the associated test procedures for level-dependent ear-muffs are contained in EN 352-4, for active noise reduction ear-muffs in EN 352-5, for ear-muffs with safety-related electrical audio input in EN 352-6 and for level-dependent ear-plugs in EN 352-7. An associated standard EN 458 [2] covers selection, use, care and maintenance of hearing protection.

The particular requirement for hearing protectors in relation to their ability to reduce noise to below daily limit levels set by Directive 2003/10/EC "on the protection of workers from the risks related to exposure to noise at work" is addressed in the standard by means of a limitation of that sound pressure level effective to the ear which is generated by the entertainment audio equipment of the ear-muff. This limitation is to be tested and reported at full volume setting. The sound pressure level limit for the reproduced sound of the audio entertainment is limited to 82 dB(A). Completion of the information given on entertainment audio ear-muffs by the passive attenuation data reported within EN 352-1, which is required by this standard, enables the user to fulfil the particular requirement on daily limit levels set by Directive 2003/10/EC.

Entertainment audio ear-muffs are designed to provide not only sound attenuation to ambient sound but also to provide entertainment audio via built-in loudspeakers. The entertainment audio signal can be transmitted by radio (broadcast or local plant programmes) or by wire or other communication. The audio signal transmission is for entertainment and not for safety or work-related purposes.

This part of the standard is a specification intended for type approval purposes, for which four sets of specimen ear-muffs are tested (further samples may be required for testing under EN 352-1 or EN 352-3, as appropriate).

The requirements and tests of the standard are concerned primarily with the entertainment audio performance of the ear-muffs. The standard may be applied to ear-muffs for fitting to industrial safety helmets.

1 Scope

This part of the Standard is concerned with entertainment audio ear-muffs. It specifies constructional and design and performance requirements, methods of test, marking requirements and user information relating to the incorporation of the entertainment audio facility.

The requirements of this standard are intended to take account of the ergonomic interaction between the wearer, the device and, where possible, the working environment in which the device is likely to be used (see Annex ZA of this standard and EN 458 [2]).

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 352-1:2002, *Hearing protectors - General requirements - Part 1: Ear-Muffs*

EN 352-3, *Hearing protectors - General requirements - Part 3: Ear-muffs attached to an industrial safety helmet*

EN 352-6:2002, *Hearing protectors - Safety requirements and testing - Part 6: Ear-muffs with electrical audio input*

EN 13819-1, *Hearing protectors — Testing — Part 1: Physical test methods*

EN 13819-2, *Hearing protectors — Testing — Part 2: Acoustic test methods*

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)*

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in EN 352-1:2002 or EN 352-6:2002, as appropriate, together with the following apply.

3.1
diffuse field related sound pressure level
sound pressure level of a diffuse sound field which will give rise to the measured ear canal sound pressure level, when a subject is exposed to a diffuse field (EN ISO 11904-1:2002, Clause 3.6)

NOTE Ear canal sound pressure level is the equivalent continuous sound pressure level measured at the ear canal measurement position (EN ISO 11904-1:2002, Clause 3.2). Ear canal measurement position is the position in the ear canal where the sound pressure is measured (EN ISO 11904-1:2002, Clause 3.1).

3.2
entertainment audio ear-muffs
ear-muffs additionally providing reproduced sound for entertainment purposes

NOTE They may be designed with an electrical audio input or with built-in broadcast receivers. Or they may be part of a complete system composed of transmitters and receiving audio ear-muffs.

4 Requirements

4.1 General

Entertainment audio ear-muffs shall meet the requirements of EN 352-1 (or EN 352-3, as appropriate). Additional requirements are listed below.

4.2 Materials and construction

The electronic circuit of the entertainment audio ear-muff shall meet the electrical safety and EMC requirements appropriate to this class of equipment.

4.3 Performance

4.3.1 General

Entertainment audio ear-muffs shall meet all the performance requirements of EN 352-1 (or EN 352-3, as appropriate), including the minimum attenuation requirement in their passive mode. Additionally, the requirements specified in 4.3.2 shall be satisfied.

Specimens of ear-muffs shall be conditioned and tested as specified in 5.1.1 and 5.1.2. The scheme of testing shall be as specified in 5.1.3.

4.3.2 Maximum sound pressure levels generated by entertainment audio

The sound output levels of the four test samples shall be tested in accordance with 5.2 and reported in the test report. The four test samples shall be tested on 8 test subjects to obtain 16 results measured on 16 ears. The mean value of 16 measurements plus one standard deviation shall not exceed 82 dB(A). In cases where a manufacturer has designed left and right cups in a different way (especially in terms of sound pressure level effective to the ear), neither the mean value of 8 measurements of left cups plus one standard deviation nor the mean value of 8 measurements of right cups plus one standard deviation shall exceed 82 dB(A).

5 Testing

This scheme of testing is additional to that described in EN 13819-1 and EN 13819-2. It shall be carried out on additional samples. Estimates of uncertainty shall be presented with results, according to Annex A.

5.1 Specimens, Conditioning and Scheme of Testing

5.1.1 Specimens

Four pairs of ear-muffs shall be submitted for testing. The individual ear-muff cups shall be numbered 1 to 8. If batteries are present, fresh batteries shall be fitted for the tests.

5.1.2 Conditioning and testing atmosphere

All specimens shall be conditioned and tested in an atmosphere having a temperature of 22 ºC ± 5 ºC and a relative humidity of not more than 85 %.

5.1.3 Scheme of testing

The eight ear-muff cups shall be tested as described in 5.2.

5.2 Determination of maximum sound pressure levels generated by entertainment audio ear-muffs

5.2.1 Introduction

The A-weighted diffuse field related sound pressure level with the entertainment audio system operated at maximum settings is measured for speech- and music-like input signal.

5.2.2 Test signal

The test input signal shall be broadband noise having the overall spectrum shape of long-term speech and music as referenced in IEC 60268-1 [1].

5.2.3 Test method

EN ISO 11904-1 shall be used. The general test procedure is described in EN 13819-2. For the purposes of this Standard, the sound output level of the entertainment audio facility of the ear-muff shall be measured using the microphone in the real ear technique (MIRE) described in EN ISO 11904-1. Eight subjects shall be used, with measurements on both ears, giving sixteen data sets. Each one of the four ear-muff samples shall be used by two of these subjects. The measured levels shall be corrected for the diffuse-field frequency response of the subject's ear canal to give the A-weighted diffuse-field related sound pressure level produced by the entertainment audio facility.

For safety, the blocked ear canal procedure of EN ISO 11904-1 shall be used.

a) Entertainment audio ear-muffs with an electrical audio input:

Use the method described in EN 352-6, but in addition to the requirements of EN 352-6 the requirement 4.3.2 of this standard shall be fulfilled for all electrical input levels up to the maximum specified by the manufacturer/supplier.

b) Complete systems composed of transmitters and entertainment audio ear-muffs:

The transmitting, receiving and amplifying devices shall be adjusted to maximum setting.

c) Ear-muffs with built-in broadcast receivers:

An FM RF signal generator shall be used. The input voltage r.m.s. level of the signal specified in 5.2.2 shall result in maximum possible frequency modulation (as specified by the manufacturer or supplier).

NOTE Extract from EN 50332-1 [4] "Sound system equipment: Headphone and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1. The use of the general method for 'one package equipment'" is proposed. Clause 5.4 "Test signal level for FM radio" quotes "Measurements on receivers for frequency modulated sound broadcasting emissions", as defined in EN 60315-4 [5].

“The signal to peak level at the receiver's output is directly proportional to the peak frequency deviation of the RF carrier. In order to comply with definition of maximum peak frequency deviation (determined with a sinusoidal modulating waveform), and to take into account pre-emphasis influence, the test signal applied at the input of the RF generator shall be set at an RMS value of - 6 dB related to the amplitude of a sinusoidal waveform at 250 Hz, producing a peak deviation of ± 75 kHz."

The A-weighted diffuse-field related sound pressure level shall be calculated. This procedure shall be followed, using the same electrical input levels, the same settings of the generation, transmitting and receiving equipment under test, for each subject.