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Hearing protectors - General requirements - Part 3: Earmuffs attached to head protection and/or face protection devices

Gehörschützer - Allgemeine Anforderungen - Teil 3: An Kopfschutz und/oder Gesichtsschutzgeräten befestigte Kapselgehörschützer

Protecteurs individuels contre le bruit - Exigences générales - Partie 3 : Serre-tête montés sur dispositifs de protection de la tête et/ou du visage

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Hearing protectors - General requirements - Part 3: Earmuffs attached to head protection and/or face protection devices

Protecteurs individuels contre le bruit - Exigences
générales - Partie 3 : Serre-tête montés sur dispositifs
de protection de la tête et/ou du visage

Gehörschützer - Allgemeine Anforderungen - Teil 3: An
Kopfschutz und/oder Gesichtsschutzgeräten befestigte
Kapselgehörschützer

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European foreword

This document (prEN 352-3:2018) 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 will supersede EN 352-3:2002.

This document has been prepared under a standardization request 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.

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Introduction

This document sets requirements for personal hearing protection devices in relation to Regulation (EU) 2016/425 on personal protective equipment.

The particular requirement in relation to the ability of hearing protectors to reduce noise below daily limit levels is addressed in the standard by requiring the sound attenuation of the hearing protectors, measured in accordance with EN ISO 4869-1, to be not less than a specified minimum. Further, by requiring that the measured sound attenuation be declared, the selection of suitable hearing protectors for individual circumstances may be undertaken according to established practice.

EN 352-3 is part of a family of standards describing product requirements for hearing protectors:

- EN 352-1, *Hearing protectors — General requirements — Part 1: Earmuffs*
- EN 352-2, *Hearing protectors — General requirements — Part 2: Earplugs*
- EN 352-3, *Hearing protectors — General requirements — Part 3: Earmuffs attached to head protection and/or face protection devices*
- EN 352-4, *Hearing protectors — Safety requirements — Part 4: Level-dependent earmuffs*
- EN 352-5, *Hearing protectors — Safety requirements — Part 5: Active noise reduction earmuffs*
- EN 352-6, *Hearing protectors — Safety requirements — Part 6: Earmuffs with safety-related audio input*
- EN 352-7, *Hearing protectors — Safety requirements — Part 7: Level-dependent earplugs*
- EN 352-8, *Hearing protectors — Safety requirements — Part 8: Entertainment audio earmuffs*
- EN 352-9, *Hearing protectors — Safety requirements — Part 9: Earplugs with safety-related audio input*
- EN 352-10, *Hearing protectors — Safety requirements — Part 10: Entertainment audio earplugs*

Test methods for these requirements for all types of hearing protectors are described in the following standards:

- EN 13819-1, *Hearing protectors — Testing — Part 1: Physical test methods*
- EN 13819-2, *Hearing protectors — Testing — Part 2: Acoustic test methods*
- EN 13819-3, *Hearing protectors — Testing — Part 3: Supplementary acoustic test methods*

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

The parts of EN 352, other than parts 1, 2 and 3, cover the performance of functions additional to passive hearing protection. Hearing protectors which incorporate one or more of these functions are subject to the requirements and tests of each of the relevant parts of EN 352, including parts 1, 2 or 3, as appropriate.

The requirements of EN 352-3 are concerned primarily with the physical and acoustic performance of ear-muffs attached to head protection and/or face protection devices (mounted earmuffs).

The sizing requirements enable the majority of the industrial population to be fitted satisfactorily by "medium size range" mounted earmuffs. Populations of other sizes may be accommodated by "small

size range" or "large size range" mounted earmuffs, which are required to be accompanied by information regarding the range of sizes which they are designed to fit.

The standard also calls for the values of sound attenuation afforded by the mounted earmuffs (measured in accordance with EN ISO 4869-1) in order to assist purchasers in selecting the most appropriate model for their needs. Minimum values of sound attenuation are also specified.

A maximum variability in insertion loss, measured objectively after a series of performance tests, is specified. The objective test method only facilitates the making of comparative measurements, and the insertion loss values obtained will differ from the measured sound attenuation values. The latter, which requires the mounted earmuffs to be tested whilst being worn by human test subjects, is regarded as providing the reference test method for the measurement of the acoustic performance of hearing protectors.

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prEN 352-3:2018 (E)**1 Scope**

This document specifies requirements for construction, design, performance, marking and user information for earmuffs attached to head protection and/or face protection devices, hereinafter referred to as 'mounted earmuffs'.

In particular, it specifies the sound attenuation of mounted earmuffs, measured in accordance with EN ISO 4869-1.

Because one model of earmuffs designed to be attached to head protection and/or face protection devices can be fitted to a number of other models and sizes of the carrier, this part of the standard sets out a series of physical and acoustic requirements for earmuffs when fitted to the specified model(s) or size(s) of head protection and/or face protection device.

All requirements apply to earmuffs fitted to one of the specified models or sizes of head protection and/or face protection device (the basic combination). An abbreviated set of requirements applies to the same model of earmuffs when fitted to the other specified models or sizes of head protection and/or face protection device (the supplementary combinations).

Information shall be given on the range of models of carriers tested with the earmuffs which satisfies this document.

Ergonomic aspects are addressed by taking into account, within the requirements, the interaction between the user, the device and, where possible, the working environment in which the device is likely to be used (see Annex ZA and EN 458).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13819-1:2002, *Hearing protectors - Testing - Part 1: Physical test methods*

EN 13819-2:2002, *Hearing protectors - Testing - Part 2: Acoustic test methods*

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

3 Terms and definitions

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

3.1**cup**

hollow component which is mounted on the equivalent headband and to which a cushion and a liner are usually fitted

[SOURCE: prEN 352-1:2018, 3.1]

3.2**cup supporting arm**

arm, usually of metal or plastics, attached to the head protection and/or face protection device shell and designed to enable the earmuffs' cup to fit securely around the ear by exerting pressure through the cushion

Note 1 to entry: It includes the means of attachment to the head protection and/or face protection device.

3.3

cushion

deformable component, usually containing a foam plastic or fluid filling, fitted to the rim of the cup to improve the comfort and fit of the earmuffs on the head

[SOURCE: prEN 352-1:2018, 3.2]

3.4

liner

acoustically absorptive material contained within the cup which is intended to increase the attenuation of the earmuffs at certain frequencies

[SOURCE: prEN 352-1:2018, 3.3]

3.5

earmuffs

hearing protector consisting of circumaural cups pressed or held against the head around each pinna

[SOURCE: prEN 352-1:2018, 3.5]

3.6

headband

band, usually of metal and/or plastics, designed to enable the earmuffs to fit securely around the ears by exerting force against the cups and pressure through the cushions

Note 1 to entry: For mounted earmuffs it is deemed to be that part of the mounted earmuffs which supports the cups. It comprises the head protection and/or face protection device (carrier) and the cup supporting arms and is intended to be functionally equivalent to the headband of headband earmuffs.

[SOURCE: prEN 352-1:2018, 3.4, modified – Note 1 to entry added.]

3.7

carrier

head protection and/or face protection device, primarily intended to protect the upper part of the user's head and/or face against injury from objects

Note 1 to entry: It complies with the requirements of the following standards: EN 812:2012, EN 397:2006, EN 14052:2013 and EN 12492:2012

Note 2 to entry: All these standards are compliant with EN 960:2006. This list is non-exhaustive.

3.8

external vertical distance

vertical distance between the top of the test headform on which the carrier is mounted and the highest point on the outside surface of the carrier shell

prEN 352-3:2018 (E)**3.9****insertion loss**

mean algebraic difference, in decibels, between the one-third-octave-band sound pressure level measured by the microphone of the acoustic test fixture in a specified sound field under specified conditions with the hearing protector absent and the sound pressure level with the hearing protector present, with other conditions identical

[SOURCE: EN ISO 4869-3:2007, 3.5, modified — The words “in a specified sound field under specified conditions ” and “with other conditions identical” have been added.]

3.10**sound attenuation**

for a given test signal, the mean difference in decibels between the threshold of hearing with and without the hearing protector in place, measured in accordance with EN ISO 4869-1 for a panel of test subjects

[SOURCE: EN ISO 4869-1:1990, 3.8, modified — The words “for a test subject” have been replaced by “, measured in accordance with EN ISO 4869-1 for a panel of test subjects”.]

3.11**parking position**

position of the earmuffs in which the cups are located above the level of the lower edge of the carrier shell, as specified by the earmuffs manufacturer in accordance with 6 k)

Note 1 to entry: See also 3.12.

3.12**stand-by position**

position of the earmuffs in which the cups are located below the level of the lower edge of the carrier shell and in which the cushions are held away from the side of the head or pinna

Note 1 to entry: See also 3.11.

3.13**basic combination**

mounted earmuffs which include the first or only model or size of carrier to which a given model of earmuffs is fitted, and which will undergo all the tests in the standard

Note 1 to entry: See also 3.14.

3.14**supplementary combination**

mounted earmuffs which include a model or size of carrier, (other than the carrier of the basic combination), to which is fitted the same model of mounted earmuffs as for the basic combination, and which will undergo an abbreviated set of tests

Note 1 to entry: See also 3.13.

Note 2 to entry: The first tested combination of a model of earmuffs and a carrier is the basic combination. The next combination of a new carrier and the same model of earmuffs is tested as a supplementary combination, regardless when the basic combination was tested and regardless of the difference of model and size of the carrier. This applies even if the carrier of the basic combination is not manufactured anymore.

3.15

hygiene covers

temporary, disposable covers fitted over the cushions and intended to protect them from the effects of dirt, perspiration and cosmetics, etc

[SOURCE: prEN 352-1:2018, 3.9]

4 Requirements

4.1 Sizing

Mounted earmuffs shall be classified into three size ranges, 'medium size range', 'small size range' and 'large size range'.

'Medium size range' earmuffs shall be classified as 'medium size range' if their adjustability complies with 4.3.2.2.

'Small size range' earmuffs shall be classified as 'small size range' if their adjustability complies with 4.3.2.3.

'Large size range' earmuffs shall be classified as 'large size range' if their adjustability complies with 4.3.2.4.

'Small size range' and 'large size range' mounted earmuffs shall be accompanied by the information specified in 6 m).

NOTE A model of mounted earmuffs can fall into more than one size range.

4.2 Materials and construction

4.2.1 Materials

4.2.1.1 Those parts of the earmuffs that may come into contact with the skin shall be non-staining, soft, pliable and not known to be likely to cause skin irritation, allergic reaction or any other adverse effect on health.

4.2.1.2 All materials shall be visibly unimpaired after cleaning and disinfection by the methods specified by the manufacturer.

4.2.2 Construction

4.2.2.1 All parts of the earmuffs and cup supporting arms shall be rounded, finished smooth and be free from sharp edges.

4.2.2.2 Earmuffs whose cushions and/or liners are intended by the manufacturer to be replaced by the user shall not require the use of tools for this purpose.

4.3 Performance

4.3.1 General

The requirements specified in 4.3.2 to 4.3.12 shall be satisfied.

Mounted earmuffs shall be conditioned and tested in accordance with EN 13819-1:2002, 4.1.1, 4.1.2 and 4.1.3.