



**SLOVENSKI STANDARD**  
**SIST EN 352-1:2003**

**01-januar-2003**

**BUXca Yý U**  
**SIST EN 352-1:1996**

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**Varovala sluha - Splošne zahteve - 1. del: Naušniki**

Hearing protectors - General requirements - Part 1: Ear-Muffs

Gehörschützer - Allgemeine Anforderungen - Teil 1: Kapselgehörschützer

Protecteurs individuels contre le bruit - Exigences générales - Partie 1: Serre-tete  
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**Ta slovenski standard je istoveten z: ~~SIST EN 352-1~~ EN 352-1:2002**

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**ICS:**

13.340.20 Varovalna oprema za glavo Head protective equipment

**SIST EN 352-1:2003**

**en**

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English version

## Hearing protectors - General requirements - Part 1: Ear-Muffs

Protecteurs individuels contre le bruit - Exigences  
générales - Partie 1: Serre-têteGehörschützer - Allgemeine Anforderungen - Teil 1:  
Kapselgehörschützer

This European Standard was approved by CEN on 18 August 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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## Foreword

This document (EN 352-1:2002) has been prepared by Technical Committee CEN/TC 159, "Hearing protectors", the secretariat of which is held by SIS.

**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of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This document supersedes EN 352-1:1993.

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.

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

Annex A is informative.

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**EN 352-1:2002 (E)****Introduction**

This standard for "Hearing Protectors - General requirements - Ear-muffs", sets requirements for personal hearing protection devices in relation to Directive 89/686/EEC - 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 24869-1, 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 352-1 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 deals with testing plans common to all types of hearing protectors covered by this series of ENs, and is in two Parts; Part 1: Physical test methods, and Part 2: Acoustic test methods.

Additional safety requirements and the associated test procedures for level-dependent ear-muffs are contained in EN 352-4, for ear-muffs with active noise reduction in prEN 352-5, for ear-muffs with audio communications in prEN 352-6 and for level-dependent ear-plugs in prEN 352-7.

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.

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

The requirements of the standard are concerned primarily with the physical and acoustic performance of the ear-muffs.

The sizing requirements enable the great majority of the industrial population to be fitted satisfactorily by "medium size range" ear-muffs. Populations of other sizes may be accommodated by "small size range" or "large size range" ear-muffs, 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 ear-muffs (measured in accordance with EN 24869-1) in order to assist purchasers in selecting the most appropriate model of ear-muffs 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 require the ear-muff 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

## 1 Scope

This part of the standard specifies requirements for construction, design, performance, marking and user information for ear-muffs.

In particular, it specifies the sound attenuation of the ear-muffs, measured in accordance with EN 24869-1.

This part of the standard does not deal with ear-muffs for attachment to a helmet or which are part of a helmet.

Ergonomic aspects are addressed by taking into account, within the requirements, the interaction between the wearer, 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

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 4869-2:1994)*

## 3 Terms and definitions

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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

### 3.2

#### **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 ear-muffs on the head

### 3.3

#### **liner**

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

### 3.4

#### **ear-muff**

hearing protector consisting of a cup to be pressed against each pinna or of a circumaural cup to be pressed against the head around each pinna. The cups may be pressed against the head with a headband or by means of a device attached to a safety helmet or other equipment

#### 3.4.1

##### **over-the-head ear-muff**

ear-muff designed to be worn with the headband passing over the top of the head

**EN 352-1:2002 (E)****3.4.2****behind-the-head ear-muff**

ear-muff designed to be worn with the headband passing behind the head

**3.4.3****under-the-chin ear-muff**

ear-muff designed to be worn with the headband passing under the chin

**3.4.4****universal ear-muff**

ear-muff designed to be worn as an over-the-head, a behind-the-head and an under-the-chin ear-muff

**3.5****headband**

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

**3.6****headstrap**

flexible strap fitted to each cup, or to the headband close to the cup. It is designed to support behind-the-head and under-the-chin ear-muffs by passing over, and resting on top of, the head

**3.7****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 on, with other conditions identical

**3.8****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, for a panel of test subjects

**3.9****hygiene covers**

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

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**4 Requirements****4.1 Sizing**

Ear-muffs shall be classified into three size ranges, 'Medium size range', 'Small size range' and 'Large size range'.

'Medium size range' ear-muffs shall be so classified if their adjustability complies with clause 4.3.2.2 a) and 4.3.2.2 b), as appropriate.

'Small size range' ear-muffs shall be so classified if their adjustability complies with 4.3.2.3 a) and 4.3.2.3 b), as appropriate.

'Large size range' ear-muffs shall be so classified if their adjustability complies with 4.3.2.4 a) and 4.3.2.4 b), as appropriate.

'Small size range' and 'large size range' ear-muffs shall be accompanied by the information specified in 6.2 g).

NOTE A model of ear-muffs may fall into more than one size range.



## 4.2 Materials and construction

### 4.2.1 Materials

**4.2.1.1** Those parts of the ear-muffs 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 ear-muffs shall be rounded, finished smooth and be free from sharp edges.

**4.2.2.2** Ear-muffs whose cushions and/or liners are intended by the manufacturer to be replaced by the wearer shall not require the use of tools for this purpose.

**4.2.2.3** All universal ear-muffs that have a mass in excess of 150 g shall be provided with a headstrap.

**4.2.2.4** Ear-muffs that are suitable for wearing only in the behind-the-head or under-the-chin modes, and that have a mass in excess of 150 g, shall be provided with a headstrap.

## 4.3 Performance

### 4.3.1 General

The requirements of 4.3.2 to 4.3.12 shall be satisfied.

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

### 4.3.2 Sizing and adjustability

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#### 4.3.2.1 General

Sizing and adjustability shall be tested in accordance with EN 13819-1:2002, 4.2 and the following requirements satisfied, as appropriate.

In the case of ear-muffs incorporating a means to adjust the headband force, these requirements shall be satisfied at both the maximum and the minimum force setting.

#### 4.3.2.2 'Medium size range' ear-muffs

##### a) Over-the-head ear-muffs

For each of the combinations of test dimensions shown by the letter M in EN 13819-1:2002, Table 1, the range of adjustment of the cups/headband and of the width between the cushions shall enable the ear-muffs to be fitted to the fixture.

##### b) Behind-the-head and under-the-chin ear-muffs

For each of the combinations of test dimensions shown by the letter M in EN 13819-1:2002, Table 2, the range of adjustment of the cups/headband and of the width between the cushions shall enable the ear-muffs to be fitted to the fixture.

#### 4.3.2.3 'Small size range' ear-muffs

##### a) Over-the-head ear-muffs