

# Sound system equipment —

## Part 7: Headphones and earphones

The European Standard EN 60268-7:1996 has the status of a  
British Standard

ICS 33.160.50

# Committees responsible for this British Standard

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- Association of British Theatre Technicians
- Audio Engineering Society
- British Broadcasting Corporation
- British Educational Suppliers' Association
- British Federation of Audio
- British Radio and Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Federation of the Electronics Industry
- Independant Television Association (ITVA)
- Institute of Sound and Communication Engineers
- Institution of Electrical Engineers
- International Association of Broadcasting Manufacturers
- Professional Lighting and Sound Association
- Royal Institute of British Architects
- Royal National Institute for Deaf People
- Society of Cable Television Engineers

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## National foreword

This British Standard has been prepared by Subcommittee EPL/100/3 and is the English language version of EN 60268-7:1996 *Sound system equipment — Part 7: Headphones and earphones*, published by the Committee for Electrotechnical Standardization (CENELEC). It is identical to IEC 268-7:1996, published by the International Electrotechnical Commission (IEC). The additional designation of this standard as BS 6840-7 has been retained for ease of reference in relation to other Parts of BS 6840 (IEC 268 series).

BS 6840 consists of the following Parts:

- *Part 1: Methods for specifying and measuring general characteristics used for equipment performance;*
- *Part 2: Glossary of general terms and calculation methods;*
- *Part 3: Methods for specifying and measuring the characteristics of sound system amplifiers;*
- *Part 4: Methods for specifying and measuring the characteristics of microphones;*
- *Part 5: Methods for specifying and measuring the characteristics of loudspeakers;*
- *Part 6: Methods for specifying and measuring the characteristics of auxiliary passive elements;*
- *Part 7: Headphones and earphones;*  
(BS EN 60268-7)
- *Part 8: Methods for specifying and measuring the characteristics of automatic gain control devices;*
- *Part 9: Methods for specifying and measuring the characteristics of artificial reverberation, time delay and frequency shift equipment;*
- *Part 10: Methods for specifying and measuring the characteristics of peak programme level meters;*
- *Part 11: Specification for application of connectors for the interconnection of sound system components;*
- *Part 12: Specification for applications of connectors for broadcast and similar use;*  
(BS EN 60268-12)
- *Part 13: Guide for listening tests on loudspeakers;*
- *Part 14: Guide for circular and elliptical loudspeakers; outer frame diameters and mounting dimensions;*
- *Part 15: Specification for matching values for the interconnection of sound system components;*
- *Part 16: Guide to the “RASTI” method for the objective rating of speech intelligibility in auditoria;*
- *Part 17: Methods for specifying and measuring their characteristics of standard volume indicators;*
- *Part 18: Peak programme level meters: Guide for digital audio peak level meter.*

**Cross-references**

| <b>Publication referred to</b>                        | <b>Corresponding British Standard</b>                                                                                                                                                                                                            |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 23741:1991<br>(ISO 3741:1988)                      | BS 4196 <i>Sound power levels of noise sources</i><br>Part 1:1991 <i>Precision methods for determination of sound power levels for broad-band sources in reverberation rooms</i>                                                                 |
| EN 24869-1:1992<br>(ISO 4869-1:1990)                  | BS EN 24869 <i>Acoustics. Hearing protectors</i>                                                                                                                                                                                                 |
| EN 24869-3:1993 <sup>1)</sup><br>(ISO/TR 4869-3:1989) | BS EN 24689-1:1993 <i>Sound attenuation of hearing protectors. Subjective method of measurement</i><br>BS EN 24869-3:1994 <i>Simplified method for measurement of insertion loss of ear-muff type protectors for quality inspection purposes</i> |
| HD 472 S1:1989                                        | BS 7697:1993 <i>Nominal voltages for low voltage public electricity supply systems</i>                                                                                                                                                           |
| IEC 50(801):1994                                      | BS 4727 <i>Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms.</i><br>Part 3 <i>Terms particular to telecommunications and electronics</i>                                                           |
| EN 60068 series                                       | Group 08:1995 <i>Acoustics and electroacoustics</i>                                                                                                                                                                                              |
| EN 60086 series                                       | BS EN 60068 <i>Environmental testing</i>                                                                                                                                                                                                         |
| HD 323 series<br>(IEC 68 series)                      | BS EN 60086 <i>Primary batteries</i>                                                                                                                                                                                                             |
| HD 211.2 S9:1993<br>(IEC 86 series)                   | BS 2011 <i>Environmental testing</i>                                                                                                                                                                                                             |
| IEC 263:1982                                          | BS 397 <i>Primary batteries</i>                                                                                                                                                                                                                  |
| HD 483                                                | BS 6397:1983 <i>Specification for scales and sizes for plotting frequency characteristics and polar diagrams</i>                                                                                                                                 |
| HD 483.1 S2:1989<br>(IEC 268-1:1985)                  | BS 6840 <i>Sound system equipment</i>                                                                                                                                                                                                            |
| HD 483.2 S2:1993<br>(IEC 268-2:1987)                  | Part 1:1987 <i>Methods for specifying and measuring general characteristics used for equipment performance</i>                                                                                                                                   |
| HD 483.3 S2:1992<br>(IEC 268-3:1988)                  | Part 2:1993 <i>Glossary of general terms and calculation methods</i>                                                                                                                                                                             |
| HD 483.11 S3:1993<br>(IEC 268-11:1987)                | Part 3:1992 <i>Methods for specifying and measuring the characteristics of sound system amplifiers</i>                                                                                                                                           |
| HD 483.15 S4:1992<br>(IEC 268-15:1987)                | Part 11:1994 <i>Specification for application of connectors for the interconnection of sound system components</i>                                                                                                                               |
| EN 60268-12:1987                                      | Part 15:1992 <i>Specification for matching values for the interconnection of sound system components</i><br>BS EN 60268 <i>Sound system equipment</i>                                                                                            |
| HD 443 S1:1983<br>(IEC 711:1981)                      | BS EN 60268-12:1995 <i>Application of connectors for broadcast and similar use</i>                                                                                                                                                               |
| HD 549 S1:1989<br>(IEC 914:1988)                      | BS 6310:1982 <i>Specification for occluded-ear simulator for the measurement of earphones coupled to the ear by ear inserts</i><br>BS 7154:1989 <i>Specification for conference systems: electrical and audio requirements</i>                   |

<sup>1)</sup> Now published by CEN.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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## Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, the EN title page, pages 2 to 24, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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ICS 17.140.50; 33.160.50

Descriptors: Electroacoustic equipment, headphones, earphones, definition, designation, classification, specification, characteristics, measurement

English version

## Sound system equipment Part 7: Headphones and earphones

(IEC 268-7:1996)

Equipements pour systèmes électroacoustiques  
Partie 7: Casques et écouteurs  
(CEI 268-7:1996)

Elektroakustische Geräte  
Teil 7: Kopfhörer und Ohrhörer  
(IEC 268-7:1996)

This European Standard was approved by CENELEC on 1996-03-05. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CENELEC

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B-1050 Brussels**

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## Foreword

The text of document 84/417/FDIS, future edition 2 of IEC 268-7, prepared by TC 84 (transformed into SC 100C, Equipment and systems in the field of audio, video and audiovisual engineering, of IEC TC 100, Audio, video and multimedia systems and equipment), was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60268-7 on 1996-03-05.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-12-01

Annexes designated “normative” are part of the body of the standard. Annexes designated “informative” are given for information only. In this standard, annexes A and ZA are normative and annexes B, C, D and E are informative. Annex ZA has been added by CENELEC.

In the official version, for annex E, Bibliography, the following notes have been added for the standards indicated:

|           |                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------|
| IEC 65    | NOTE Harmonized, together with its amendments 1:1987 + 2:1989 + 3:1992 as EN 60065:1993 (modified). |
| IEC 118-0 | NOTE Harmonized as EN 60118-0:1993 (not modified)                                                   |

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## 1 General

### 1.1 Scope

This part of IEC 268 applies to headphones, headsets, earphones and earsets, intended to be used on, or in, the human ear. It also applies to equipment, such as pre-amplifiers, passive networks and power supplies which form an integral part of the headphone system.

It does not deal with:

- safety, for which reference should be made to IEC 65 [1]<sup>2)</sup> or another appropriate standard;
- the characteristics of microphones of headsets, for which reference should be made to IEC 268-4 [2];
- earphones and other devices for hearing aids, for which reference should be made to IEC 118-0 [3];
- headphones for audiometry;
- headphones and other devices which form part of an active ear-defender system, although some of its provisions may be applicable.

This standard specifies the characteristics which should be included by the manufacturer in specifications, and relevant methods of measurement. It includes a classification of the different types of earphone, mainly characterized by the way in which the transducer is coupled acoustically to the ear, and a classification code which may also be used for marking.

### 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 268. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 268 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 38:1983, *IEC standard voltages*.

IEC 50(801):1994, *International Electrotechnical Vocabulary — Chapter 801: Acoustics and electroacoustics*.

IEC 68, *Basic environmental testing procedures*.

IEC 86, *Primary batteries*.

IEC Guide 106:1989, *Guide for specifying environmental conditions for equipment performance rating*.

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

IEC 268-1:1985, *Sound system equipment — Part 1: General*.

IEC 268-2:1987, *Sound system equipment — Part 2: Explanation of general terms and calculation methods*.

IEC 268-3:1987, *Sound system equipment — Part 3: Amplifiers*.

IEC 268-11:1987, *Sound system equipment — Part 11: Applications of connectors for the interconnection of sound system components*.

IEC 268-12:1987, *Sound system equipment — Part 12: Applications of connectors for broadcast and similar use*.

IEC 268-15:1987, *Sound system equipment — Part 15: Preferred matching values for the interconnection of sound system components*.

IEC 711:1981, *Occluded-ear simulator for the measurement of earphones coupled to the ear by ear inserts*.

IEC 914:1988, *Conference systems — Electrical and audio requirements*.

IEC 959:1990, *Provisional head and torso simulator for acoustic measurements on air conduction hearing aids*.

ISO 3741:1988, *Acoustics — Determination of sound power levels of noise sources — Precision methods for broad-band sources in reverberation rooms*.

ISO 4869-1:1990, *Acoustics — Hearing protectors — Part 1: Subjective method for the measurement of sound attenuation*.

ISO TR 4869-3:1989, *Acoustics — Hearing protectors — Part 3: Simplified method for the measurement of insertion loss of ear-muff type protectors for quality inspection purposes*.

<sup>2)</sup> Figures in square brackets refer to the bibliography given in annex E.

### 1.3 Definitions

For the purpose of this part of IEC 268, the following definitions apply:

NOTE Any device included between a transducer as defined in 1.3.1 to 1.3.15 and the connector(s) for electrical input should be regarded as part of the transducer.

#### 1.3.1 earphone

electroacoustic transducer by which acoustic oscillations are obtained from electric signals and intended to be closely coupled acoustically to the ear [IEV 801-27-18]

#### 1.3.2 headphone

assembly of one or two earphones on a headband or chinband, the use of which may be optional (e.g. with intra-concha earphones)

#### 1.3.3 headset

headphones equipped with a microphone

#### 1.3.4 earset

earphones equipped with a microphone

NOTE This definition is included because the term appears in the catalogue of IEC publications.

#### 1.3.5 insert earphone

small earphone that is attached directly to a connecting element, for example an earmould, inserted into the ear canal [IEV 801-27-22, modified]

#### 1.3.6 intra-concha earphone

small earphone that fits in the concha cavity, with its acoustic exit close to the entrance of the ear canal

NOTE The definition of “insert earphone” is modified from that in IEC 50(801), and the definition of “intra-concha earphone” introduced, because the methods of measurement of the two types differ.

#### 1.3.7 supra-aural earphone

earphone applied externally to the outer ear and intended to rest on the pinna [IEV 801-27-23, modified]

#### 1.3.8 supra-concha earphone

earphone intended to rest on the ridges of the concha cavity

#### 1.3.9 circumaural earphone

earphone having a cavity large enough to cover the region of the head including the ear [IEV 801-27-24]

#### 1.3.10 ear shell

circumaural type of earphone hanging on the ear [IEC 914]

#### 1.3.11 stethoscopic headphone

insert headphone by which the earphone(s) is/are coupled to the ears by means of a pair of rigid tubes, so that the assembly resembles a stethoscope

#### 1.3.12 acoustically open earphone

earphone which intentionally provides an acoustic path between the external environment and the ear canal

#### 1.3.13 acoustically closed earphone

earphone which is intended to prevent acoustic coupling between the external environment and the ear canal

#### 1.3.14 closed-back earphone

earphone which does not emit significant sound radiation from the back of the transducer to the external environment

#### 1.3.15 open-back earphone

earphone which emits significant sound radiation from the back of the transducer to the external environment