IEC 60268-7

Edition 4.0 2025-06
COMMENTED VERSION

INTERNATIONAL STANDARD

Sound system equipment –
Part 7: Headphones and earphones

ICS 33.160.50

ISBN 978-2-8327-0547-6

IEC 60268-7:2025-06 CMV(en)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Sound system equipment - Part 7: Headphones and earphones

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This commented version (CMV) of the official standard IEC 60268-7:2025 edition 4.0 allows the user to identify the changes made to the previous IEC 60268-7:2010+AMD1:2020 CSV edition 3.1. Furthermore, comments from IEC TC 100 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60268-7 has been prepared by technical area 20: Analog and digital audio, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2010, and Amendment 1 of 2020. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- consolidated with IEC 60268-7:2010/AMD1:2020;
- clause/subclause/annex reconstruction and renumbering;
- addition of effective frequency range of the free-field / diffuse-field compensated frequency response;
- update of measurement methods of modulation distortion and difference-frequency distortion;
- addition of details of two-tone distortion measurements, see Annex I;
- addition of details of left-right tracking response for stereo headphones, see Annex J.

The text of this International Standard is based on the following documents:

Draft	Report on voting
100/4303/FDIS	100/4341/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 60268 series, published under the general title *Sound system equipment*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

~~INTRODUCTION to Amendment 1~~

~~This Amendment 1 contains the following significant technical changes with respect to IEC 60268-7:2010:~~

- ~~evaluation of free-field compensated frequency response has been added;~~
- ~~evaluation of diffuse-field compensated frequency response has been added;~~
- ~~the Bibliography has been updated;~~
- ~~some normative references have been updated;~~
- ~~the term "HATS" and its definition has been added.~~

1 Scope

This part of IEC 60268 is applicable to headphones, earphones, headsets 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.

This document does not deal with:

a) safety, for which reference ~~should be~~ is made to IEC 62368-1 or another appropriate standard;

b) the characteristics of microphones of headsets, for which reference ~~should be~~ is made to IEC 60268-4;

c) earphones and other devices for hearing aids, for which reference ~~should be~~ is made to IEC 60118-0;

d) headphones for audiometry;

e) headphones and other devices which form part of an active ear-defender system, although some of the provisions of this document ~~may~~ can be applicable;

f) active noise cancelation characteristics as covered by IEC 60268-24.

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

Rated conditions and characteristics in this document provided by the manufacturer are not generally intended for external verification. Measurement methods for rated characteristics are informative and are provided for the benefit of manufacturers for the purpose of test repeatability and data comparison. All other specifications and tests are provided for testing by the manufacturer and for external testing and verification.

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.

IEC 60038, *IEC standard voltages*

IEC 60050-801~~:1994~~, *International Electrotechnical Vocabulary – Part 801: Acoustics and electroacoustics*, available at https://www.electropedia.org

~~IEC 60068-1, *Environmental testing – Part 1: General and guidance*~~

IEC 60086-1, *Primary batteries – Part 1: General*

~~IEC Guide 106, *Guide for specifying environmental conditions for equipment performance rating*~~

IEC 60263, *Scales and sizes for plotting frequency characteristics and polar diagrams*

IEC 60268-1, *Sound system equipment – Part 1: General*

IEC 60268-2, *Sound system equipment – Part 2: Explanation of general terms and calculation methods*

IEC 60268-11, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60268-12, *Sound system equipment – Part 12: Application of connectors for broadcast and similar use*

IEC 60318-4, *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 60318-7, *Electroacoustics – Simulators of human head and ear – Part 7: Head and torso simulator for the measurement of sound sources close to the ear*

~~IEC 60711, *Occluded-ear simulator for the measurement of earphones coupled to the ear by ear inserts*[1]~~

~~IEC TR 60959, *Provisional head and torso simulator for acoustic measurements on air conduction hearing aids*[2]~~

~~IEC TS 60318-7, *Electroacoustics – Simulators of human head and ear – Part 7: Head and torso simulator for the measurement of air-conduction hearing aids*~~

IEC 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

ISO 266:1997, *Acoustics – Preferred frequencies*

ISO 48-4:2018, *Rubber, vulcanized or thermoplastic – Determination of hardness – Part 4: Indentation hardness by durometer method (Shore hardness)*

ISO 3741, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Precision methods for reverberation test rooms*

~~ISO 4869-1, *Acoustics – Hearing protectors – Part 1: Subjective method for the measurement of sound attenuation*~~

ISO 4869-3, *Acoustics – Hearing protectors – Part 3: Measurement of insertion loss of ear-muff type protectors using an acoustic test fixture*

~~ISO 7619-1, *Rubber, vulcanized and thermoplastic – Determination of indentation hardness – Part 1: Durometer method (Shore hardness)*~~

~~[1] This publication will be replaced by future IEC 60318-4 (to be published).~~

~~[2] This publication is planned to be replaced by future IEC 60318-7 (under consideration).~~

IEC 60268-7

Edition 4.0 2025-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Sound system equipment – Part 7: Headphones and earphones

Equipements pour systèmes électroacoustiques – Partie 7: Casques et écouteurs

ICS 33.160.50

ISBN 978-2-8327-0478-3

IEC 60268-7:2025-06(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Sound system equipment - Part 7: Headphones and earphones

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60268-7 has been prepared by technical area 20: Analog and digital audio, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2010, and Amendment 1 of 2020. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- consolidated with IEC 60268-7:2010/AMD1:2020;
- clause/subclause/annex reconstruction and renumbering;
- addition of effective frequency range of the free-field / diffuse-field compensated frequency response;

- update of measurement methods of modulation distortion and difference-frequency distortion;
- addition of details of two-tone distortion measurements, see Annex I;
- addition of details of left-right tracking response for stereo headphones, see Annex J.

The text of this International Standard is based on the following documents:

Draft	Report on voting
100/4303/FDIS	100/4341/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 60268 series, published under the general title *Sound system equipment*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

1 Scope

This part of IEC 60268 is applicable to headphones, earphones, headsets 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.

This document does not deal with:

a) safety, for which reference is made to IEC 62368-1 or another appropriate standard;

b) the characteristics of microphones of headsets, for which reference is made to IEC 60268-4;

c) earphones and other devices for hearing aids, for which reference is made to IEC 60118-0;

d) headphones for audiometry;

e) headphones and other devices which form part of an active ear-defender system, although some of the provisions of this document can be applicable;

f) active noise cancelation characteristics as covered by IEC 60268-24.

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

Rated conditions and characteristics in this document provided by the manufacturer are not generally intended for external verification. Measurement methods for rated characteristics are informative and are provided for the benefit of manufacturers for the purpose of test repeatability and data comparison. All other specifications and tests are provided for testing by the manufacturer and for external testing and verification.

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.

IEC 60038, *IEC standard voltages*

IEC 60050-801, *International Electrotechnical Vocabulary – Part 801: Acoustics and electroacoustics*, available at https://www.electropedia.org

IEC 60086-1, *Primary batteries – Part 1: General*

IEC 60263, *Scales and sizes for plotting frequency characteristics and polar diagrams*

IEC 60268-1, *Sound system equipment – Part 1: General*

IEC 60268-2, *Sound system equipment – Part 2: Explanation of general terms and calculation methods*

IEC 60268-11, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60268-12, *Sound system equipment – Part 12: Application of connectors for broadcast and similar use*

IEC 60318-4, *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 60318-7, *Electroacoustics – Simulators of human head and ear – Part 7: Head and torso simulator for the measurement of sound sources close to the ear*

IEC 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

ISO 266:1997, *Acoustics – Preferred frequencies*

ISO 48-4:2018, *Rubber, vulcanized or thermoplastic – Determination of hardness – Part 4: Indentation hardness by durometer method (Shore hardness)*

ISO 3741, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Precision methods for reverberation test rooms*

ISO 4869-3, *Acoustics – Hearing protectors – Part 3: Measurement of insertion loss of ear-muff type protectors using an acoustic test fixture*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

Équipements pour systèmes électroacoustiques - Partie 7: Casques et écouteurs

AVANT-PROPOS

1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'avait pas reçu notification qu'un ou plusieurs brevets pouvaient être nécessaires à sa mise en application. Toutefois, il y a lieu d'avertir les responsables de la mise en application du présent document que des informations plus récentes sont susceptibles de figurer dans la base de données de brevets, disponible à l'adresse https://patents.iec.ch. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60268-7 a été établie par le domaine technique 20: Audio analogique et numérique, du comité d'études 100 de l'IEC: Systèmes et équipements audio, vidéo et services de données. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition parue en 2010, et l'Amendement 1 de 2020. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- consolidée avec l'IEC 60268-7:2010/AMD1:2020;
- reconstruction et renumérotation de l'article/du paragraphe/de l'annexe;
- ajout de la plage effective de fréquence de la réponse en fréquence compensée en champ libre/diffus;
- mise à jour des méthodes de mesurage de la distorsion de modulation et de la distorsion par différence de fréquence;
- ajout de détails relatifs aux mesures de distorsion à deux sons, voir Annexe I;
- ajout de détails relatifs à la réponse de suivi gauche-droite pour un casque stéréo, voir Annexe J.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
100/4303/FDIS	100/4341/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

La version française de la norme n’a pas été soumise au vote.

Une liste de toutes les parties de la série IEC 60268, publiées sous le titre général *Équipement pour systèmes électroacoustiques*, se trouve sur le site web de l'IEC.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

1 Domaine d'application

La présente partie de l'IEC 60268 s'applique aux casques, aux écouteurs, aux casques téléphoniques et aux écouteurs téléphoniques destinés à être utilisés sur ou dans l'oreille humaine. Elle s'applique également aux équipements, tels que les préamplificateurs, les réseaux passifs et les alimentations qui font partie intégrante du système de casque.

Le présent document ne traite pas:

a) de la sécurité, pour laquelle il est fait référence à l'IEC 62368-1 ou à une autre norme appropriée;

b) des caractéristiques des microphones des casques téléphoniques, pour lesquels il est fait référence à l'IEC 60268-4;

c) des écouteurs et autres appareils de correction auditive, pour lesquels il est fait référence à l'IEC 60118-0;

d) des casques d'audiométrie;

e) des écouteurs et autres appareils qui font partie d'un système de protection auditive, bien que certaines dispositions du présent document puissent être applicables;

f) des caractéristiques de la suppression active du bruit de fond telles que traitées par l'IEC 60268-24.

Le présent document spécifie les caractéristiques incluses par le fabricant dans les spécifications, ainsi que les méthodes de mesure applicables. Elle comprend une classification des différents types d'écouteurs, principalement caractérisés par la façon dont le transducteur est couplé acoustiquement à l'oreille, ainsi qu'un code de classification qui peut également être utilisé pour le marquage.

Les caractéristiques et les conditions assignées du présent document fournies par le fabricant ne sont généralement pas destinées à une vérification externe. Les méthodes de mesure des caractéristiques assignées sont informatives et sont fournies dans l'intérêt des fabricants aux fins de répétabilité des essais et de comparaison des données. Toutes les autres spécifications et essais sont fournis pour les essais par le fabricant, ainsi que pour les essais et vérification externes.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60038, *Tensions normales de l'IEC*

IEC 60050-801, *Vocabulaire Électrotechnique International (IEV) – Partie 801: Acoustique et électroacoustique*, disponible à l'adresse https://www.electropedia.org

IEC 60086-1, *Piles électriques – Partie 1: Généralités*

IEC 60263, *Échelles et dimensions des graphiques pour le tracé des courbes de réponse en fréquence et des diagrammes polaires*

IEC 60268-1, *Équipements pour systèmes électroacoustiques – Partie 1: Généralités*

IEC 60268-2, *Équipements pour systèmes électroacoustiques – Partie 2: Explication des termes généraux et méthodes de calcul*

IEC 60268-11, *Équipements pour systèmes électroacoustiques – Partie 11: Application des connecteurs pour l'interconnexion des éléments des systèmes électroacoustiques*

IEC 60268-12, *Équipements pour systèmes électroacoustiques – Partie 12: Application des connecteurs pour radiodiffusion et usage analogue*

IEC 60318-4, *Électroacoustique – Simulateurs de tête et d'oreille humaines – Partie 4: Simulateur d'oreille occluse pour la mesure des écouteurs couplés à l'oreille par des embouts*

IEC 60318-7, *Électroacoustique – Simulateurs de tête et d'oreille humaines – Partie 7: Simulateur de tête et de torse pour le mesurage des sources sonores à proximité de l'oreille*

IEC 61672-1, *Électroacoustique – Sonomètres – Partie 1: Spécifications*

ISO 266:1997, *Acoustique – Fréquences normales*

ISO 48-4:2018, *Caoutchouc vulcanisé ou thermoplastique – Détermination de la dureté – Partie 4: Dureté par pénétration par la méthode au duromètre (dureté Shore)*

ISO 3741, *Acoustique – Détermination des niveaux de puissance acoustique et des niveaux d'énergie acoustique émis par les sources de bruit à partir de la pression acoustique – Méthodes de laboratoire en salles d'essais réverbérantes*

ISO 4869-3, *Acoustique – Protecteurs individuels contre le bruit – Partie 3: Mesurage de l'affaiblissement acoustique des protecteurs du type serre-tête au moyen d'un dispositif d'essai acoustique*