Sound system equipment: Headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology -- Part 1: General method for "one package equipment"

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50332-1

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ICS 17.140.50; 33.160.50

Supersedes EN 50332-1:2000

English version

Sound system equipment: Headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 1: General method for "one package equipment"

Equipement de systèmes acoustiques: Casques et écouteurs associés avec un baladeur - Méthode de mesure de niveau maximal de pression acoustique - Partie 1: Méthode générale pour "un équipement complet"

Elektroakustische Geräte: Kopfhörer und Ohrhörer in Verbindung mit tragbaren Audiogeräten - Verfahren zur Messung des maximalen Schalldruckpegels - Teil 1: Allgemeines Verfahren für "Original-Geräte-Sets"

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This document (EN 50332-1:2013) has been prepared by CLC/TC 108X, "Safety of electronic equipment within the fields of Audio/Video, Information Technology and Communication Technology".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-09-23
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2016-09-23

This document supersedes EN 50332-1:2000.

EN 50332-1:2013 includes the following significant technical changes with respect to EN 50332-1:2000:

- deletion of limits;
- addition of digital signals;
- adaptations to use the term "personal music players".

EN 50332, *Sound system equipment: Headphones and earphones associated with personal music players — Maximum sound pressure level measurement methodology,* is composed with the following parts:

– *Part 1: General method for "one package equipment*";
– *Part 2: Matching of sets with headphones if either or both are offered separately, or are offered as one package equipment but with standardised connectors between the two allowing to combine components of different manufacturers or different design*.

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1 Scope

The scope of this European Standard is to set up a suitable measuring methodology allowing accurate measurement of the maximum sound pressure level produced by consumer's headphones and earphones when associated with personal music players.

NOTE This standard does not apply to acoustically open or acoustically closed headphones associated with mains operated Hi-Fi home equipement nor does it apply to headphones for medical purposes (hard of hearing etc.) or to headphones or similar parts being part of active hearing protection systems. Other requirements for safety, e.g. for noise protection in offices and industry are not affected by this standard.

Requested features:

- The method should be reproducible and easily applicable to every type and shape of headphone or earphone available on the market (good mechanical adaptability).
- As safety and health are addressed, the method should faithfully reflect the pressure level effective at the user's ear (good correlation with subjective tests) to support protection against excessive sound pressure from personal music players (the limits themselves are found in EN 60950-1:2006/A12:2011 and EN 60065:2002/A12:2011 respectively).
- And finally, it is desirable to establish a global measuring procedure, including each component in the chain:

  Portable set
  + specific test signal
  + associated headphone or earphone.

The standard is split into two parts:

- Part 1 deals with sets provided as a package equipment by the manufacturer. In this case, "Personal music players" means the association of one set (compact cassette player, FM radio receiver, digital media player, streaming audio player…) with supplied headphones or earphones.
- Part 2 gives guidelines to associate portable audio sets (FM radio receiver, digital media player, streaming audio player…) with headphones or earphones provided separately by any source. And the package sets with standardised connectors or interfaces between the two allowing to combine components of different manufacturers or different design.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

HD 483.1 S2, *Sound system equipment — Part 1: General (IEC 60268-1)*

EN 50332-2:2013, *Sound system equipment: Headphones and earphones associated with personal music players — Maximum sound pressure level measurement methodology — Part 2: Matching of sets with headphones if either or both are offered separately, or are offered as one package equipment but with standardised connectors between the two allowing to combine components of different manufacturers or different design*

EN 60094-7, *Magnetic tape sound recording and reproducing systems — Part 7: Cassette for commercial tape records and domestic use (IEC 60094-7)*

EN 60268-7, *Sound system equipment — Part 7: Headphones and earphones (IEC 60268-7)*

EN 60315-4, *Methods of measurement on radio receivers of various classes of emission — Part 4: Receivers for frequency-modulated sound broadcasting emissions (IEC 60315-4)*

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EN 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 60318-4)*

EN 61260, *Elecroacoustics — Octave-band and fractional-octave-band filters (IEC 61260)*

EN 61672-1, *Electoacoustics — Sound level meters — Part 1: Specifications (IEC 61672-1)*

IEC 60318-7, *Electroacoustics — Simulators of human head and ear — Part 7: Head and torso simulator for acoustic measurement of hearing aids*

3 Terms and definitions

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

3.1
equivalent continuous A-weighted sound pressure level
$L_{Aeq,T}$
equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$) defined in EN 61672-1 as follows:

$$L_{Aeq,T} = 10\lg\left\{\left(\frac{1}{T}\int_{t_1}^{t_2} p_A^2(t)dt\right) \Big/ p_0^2\right\} \quad dBA$$

where

$L_{Aeq,T}$ is the equivalent continuous A-weighted sound pressure level re 20 μPa, determined over a time integration interval $T = t_2 - t_1$;

$p_A(t)$ is the instantaneous A-weighted sound pressure of the sound signal;

p_0 is the reference sound pressure of 20 μPa

4 Measuring principle

4.1 General description

The free field frequency response of a head and torso simulator is defined as follows:

The difference, as a function of frequency, between the sound pressure level at the ear simulator microphone with the reference point of the manikin at the test point and the sound pressure level at the test point with the manikin absent from a sound source at the 0 degree azimuth and 0 degree elevation angles.

The diffuse field frequency response of a head and torso simulator is defined as follows:

The difference, as a function of frequency, between the sound pressure level at the ear simulator microphone with the reference point of the manikin at the test point and the sound pressure level at the test point with the manikin absent from a sound field with a high number of reflections that, at any given point in that diffuse field, sound arrives from all angles in a uniform manner.

The sound pressure level produced by headphones or earphones can be measured by subjective methods or by objective methods.

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