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BS EN 50332-3:2017



BSI Standards Publication

Sound system equipment: headphones and earphones associated with personal music players — maximum sound pressure level measurement methodology

Part 3: measurement method for sound
dose management

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This British Standard is the UK implementation of EN 50332-3:2017.

The UK participation in its preparation was entrusted to Technical Committee EPL/108, Safety of electronic equipment within the field of audio/video, information technology and communication technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

Sound system equipment: headphones and earphones
associated with personal music players - maximum sound
pressure level measurement methodology - Part 3:
measurement method for sound dose management

Équipements de diffusion sonore: casques et écouteurs
associés avec un lecteur de musique individuel - Méthode
de mesure de niveau maximal de pression acoustique -
Partie 3: Méthode de mesure pour la gestion de la dose de
bruit

Elektroakustische Geräte: Kopfhörer und Ohrhörer in
Verbindung mit tragbaren Audiogeräten - Verfahren zur
Messung des maximalen Schalldruckpegels - Teil 3:
Messmethode für Schalldosis Management

This European Standard was approved by CENELEC on 2017-01-02. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (EN 50332-3:2017) 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) 2018-01-02
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-01-02

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

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Introduction

Ideally, sound exposure assessment should be done with a normalized dosimeter located close to the head (ears) of the user during the whole time of the exposure. However, in the context of leisure activities, and for evident practical and economical reasons, this ideal methodology cannot be applied. For a user of a Personal Music Player (PMP), a dosimeter would even have to sit inside the ear canal, close to the tympanic membrane, with exposure data transformed to diffuse field equivalent. The aim of this European Standard is to define an alternative and more applicable methodology for estimating sound exposure from PMPs.

A PMP should inform the user about potentially harmful sound exposure, long-term as well as short-term. This is accomplished by including a rolling calculation of sound dose, *CSD*, and an estimation of momentary sound exposure level, *MEL*. In case *CSD* or *MEL* exceeds defined thresholds, the user is warned and/or PMP gain is lowered. All protections should remain in place when listening to any kind of typical PMP source (music, broadcast, game etc.), but not when, for instance, having a phone call. Annex A shows a block diagram of how a complete protection system might be realized.

By adding actual PMP dose estimation to EN 50332-1 and EN 50332-2, rather than assuming the average energy of programs and tracks, warnings become more relevant to the user. Relevance and trustworthiness is essential for one of the standard's objectives: its educational value.

If estimation relies only on feed-forward principles, some uncertainty in the prediction of *in vivo* dose will persist, for instance how earplugs or headphones are mounted, spread between transducers, spectral properties of transducers, broken transducers etc. Some uncertainties can be effectively dealt with when known combinations of PMPs and headphones are employed, while it may add to the uncertainty when components are acquired separately.

Regardless that earphones, earbuds or headphones for use with PMPs may not exceed defined limits with regard to sensitivity, it is acknowledged that extra uncertainty in the exposure estimation with arbitrary combinations of PMPs and transducers will persist. However, with this part 3, actual electrical measurement of source audio as part of dose estimation, a major contributor to warning errors in general, is eliminated.

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1 Scope

This European Standard specifies sound dose measurement, and the alerts associated, to reduce the risk of listeners developing hearing impairment when using a Personal Music Player (PMP). The standard does not cover exposure from other sources than PMPs.

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.

EN 50332-1:2013, *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"*

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 62368-1, *Audio/video, information and communication technology equipment - Part 1: Safety requirements (IEC 62368-1:2014)*

HD 483.1 S2, *Sound system equipment - Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions of EN 50332-1:2013, EN 50332-2:2013 and EN 62368-1 apply.

4 Limits and calibration

4.1 General

EN 50332-3 builds on definitions from EN 50332-1 and EN 50332-2. Output limits and the calibration of the electro-acoustic loop remain unchanged, but actual audio shall be taken into account to determine maximum and minimum gain settings.

With the test signal, the relationship between sound exposure level and r.m.s. voltage remains the same, e.g. 80 dB SPL and 15 mV (EN 50332-2), see Figure 1.