

SLOVENSKI STANDARD

SIST EN 50332-2:2014

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Nadomešča:
SIST EN 50332-2:2004

Elektroakustične naprave: Naglavne in ušesne slušalke s pripadajočimi osebnimi glasbenimi predvajalniki - Metodologija za merjenje ravni največjega zvočnega tlaka - 2. del: Ujemanje elektroakustičnih naprav z naglavnimi slušalkami, če so ene ali druge ponujene ločeno ali v enem kompletu, vendar s standardiziranimi konektorji za medsebojno povezavo, ki omogočajo kombiniranje komponent različnih proizvajalcev ali različnih zasnov

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

Elektroakustische Geräte: Kopfhörer und Ohrhörer in Verbindung mit tragbaren Audiogeräten - Verfahren zur Messung des maximalen Schalldruckpegels -- Teil 2: Anpassung von Geräten und Kopfhörern, wenn eine der beiden oder beide Komponenten getrennt angeboten werden

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ICS:

17.140.50	Elektroakustika	Electroacoustics
33.160.50	Pribor	Accessories

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50332-2

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ICS 17.140.50; 33.160.50

Supersedes EN 50332-2:2003

English version

**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**

Équipement de systèmes acoustiques:
Casques et écouteurs associés avec un baladeur -

Méthode de mesure de niveau maximal de pression acoustique -

Part 2 : Adaptation des équipements avec des écouteurs provenant de différents fabricants, ou provenant d'un équipement complet mais avec des connecteurs normalisés entre les deux, permettant d'associer des composants provenant de différents fabricants ou bien de conception différente

Elektroakustische Geräte: Kopfhörer und Ohrhörer in Verbindung mit tragbaren Audiogeräten -

Verfahren zur Messung des maximalen Schalldruckpegels -

Teil 2: Anpassung von Geräten und Kopfhörern, wenn eine der beiden oder beide Komponenten getrennt angeboten werden

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CENELEC

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

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Foreword

This document (EN 50332-2:2013) 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 50332-2:2003.

EN 50332-2:2013 includes the following significant technical changes with respect to EN 50332-2:2003:

- 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.*

The Part 1 of this standard describes conditions and procedures for combination of player units and headphones sold as "one-package sets". The sound pressure limitation (SPL) of these sets is lost when players or headphones with standardised sockets and plugs are arbitrarily combined.

This Part 2 provides measurement methods for the matching values which guarantee the SPL limit also for the aforementioned condition.

1 Scope

This Part 2 of EN 50332 specifies methods of measuring the matching values for the use of personal music players and headphones/earphones defined for the use with those and with standardised connectors or interfaces allowing to combine components of different manufacturers or different design sold separately in order to avoid possible hearing impairment by excessive sound pressure resulting from them.

Compared with “one-package sets” the sound pressure level at the ear cannot be fixed by only one condition but needs at least two characteristics, one each for player and the headphones/earphones, defined by the matching values for their connection.

Requirements for protection against excessive sound pressure from personal music players are given in EN 60950-1:2006/A12:2011 and EN 60065:2002/A12:2011.

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 50332-1:2013, *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”*

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EN 60268-7:2011, *Sound system equipment — Part 7: Headphones and earphones (IEC 60268-7:2010)*

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

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

3 Terms and definitions

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

NOTE For more definitions, see EN 50332-1:2013, EN 60268-7:2011 and the basic standards for electroacoustics.

3.1

portable audio headphones and earphones

headphones and earphones, which are intended to be used with personal music players and to be mainly used for listening to the music outdoors

3.2

simulated programme signal characteristic voltage

SPCV

The input voltage for a wide band signal at an output SPL of 94 dB, defined in EN 60268-7:2011, 8.3.4.

4 Basic conditions for specifications and measurements

For basic conditions on measurements of the maximum sound pressure level, reference is made to EN 50332-1.

5 Player characteristics and methods of measurement

5.1 Maximum output voltage V_m

The maximum output voltage of the player is a wide band value measured at the headphone output under the conditions given in 5.2.

5.2 Method of measurement and conditions

5.2.1 Input signal

The player input signal shall be as specified in EN 50332-1:2013, Clause 5 recorded on the relevant medium with the specified level.

5.2.2 Operating conditions

During the test, the power source used shall not deviate more than $\pm 3\%$.

When testing, all controls shall be adjusted to the maximum sound pressure level. For example:

- noise reduction system : OFF;
- volume control : all hardware, operating system, and application volume and gain settings exposed to a normal user shall be activated and maximised;
- tone control : all frequency equalisation settings exposed to a normal user shall be activated and adjusted to maximise the sound pressure level.

All hardware and software processing systems, gain and tone control settings shall be set such as to reach the maximum sound level output.

The analogue audio output shall be loaded with a resistive load of 32 Ω per channel.

NOTE The load of 32 Ω takes into account the fact that some devices derive the headphone output from a higher voltage over an internal resistor of for example 50 Ω . These devices would result in too high output voltage at no load measurement condition.

5.2.3 Method of measurement for analogue audio outputs

The measuring instruments shall conform to:

- EN 61672-1, class 1 (for sound level meters);
- EN 61260, class 1 (for 1/3 octave analysers).

The maximum output voltage V_m shall be defined as unweighted r.m.s. voltage at the load, using an averaging time of 30 s or more.

5.2.4 Method of measurement for digital audio outputs

The maximum output level, L_m shall be defined as an average of digital signal, using an averaging time of 30 s or more.

The digital input test signal is defined in EN 50332-1 as -10 dBFS. Digital player outputs should provide corresponding values for safety reason (see EN 60950-1, EN 60065 and EN 62368-1).

6 Headphone/Earphone characteristics and methods of measurement

6.1 Measuring equipment

The measuring equipment shall be in accordance with EN 61672-1 when connected with a HATS microphone. It shall specifically comply with the requirement for “an integrating-averaging sound level meter that measures time-average sound level.

6.2 Simulated programme signal characteristic voltage

This characteristic is defined in 3.2.

6.3 Method of measurement arrangement and conditions

6.3.1 Input signal

The test signals shall be the programme simulation noise as defined in HD 483.1 S2. Further details are given in the respective subclauses of EN 50332-1:2013, Clause 5.

6.3.2 Source impedance of analogue input devices

The output impedance of the test signal source shall be $\leq 2 \Omega$.

6.3.3 Acoustical measurement method

The acoustical measurements are done by using a suitable HATS as defined in EN 50332-1:2013, 4.2.

6.3.4 Headphones/earphones fit

Headphones/earphones shall be positioned on the measuring device correctly, so that the measured sound pressure level is maximised. The manufacturer's instructions for correct use have to be taken into account.

The headphones/earphones intended to be connected to a player are currently binaural. However, the monaural headphones/earphones are also within the scope of the standard. They will be placed on the HATS according to the principles described in EN 50332-1:2013, 6.2. It shall be checked that the position of the headphones/earphones on the HATS corresponds to the maximum signal level measured by the HATS.

For binaural headphones/earphones both left and right are measured.

6.3.5 Measurement and evaluation

See EN 50332-1:2013, 6.4.

The simulated programme signal characteristic voltage of analogue headphone input is the input signal voltage when the sound pressure level reaches 94 dB SPL A-weighted. Within guaranteed linear operation of the headphone/earphone the value can be calculated from results with other SPL output.

The $L_{Aeq,T}$ of a digital headphone/earphone input is the acoustic output sound pressure level measured in the test protocol of EN 50332-1:2013, Clause 6 with the input signal as defined in 6.3.1 of this standard.

Annex A (informative)

Example test procedure for acoustic safety of listening devices

A.1 Acoustic coupling between listening device's receiver and the ear simulator on HATS (head and torso simulator)

A.1.1 General

- a) All listening devices shall be coupled to the ear in a way that closely approximates real use. Refer to the listening device's user guide for the recommend use position or intended usage.
- b) No extra force shall be used in any of listening device coupling.
- c) All tests shall be repeated as given in EN 50332-1:2013, 6.4.

A.1.2 Circum-aural, Supra-aural and Supra-concha listening devices

- a) If there is a headband, it shall be extended to the length that it lightly touches the top of the HATS.
- b) If multiple types of ear cushions are provided, all cushion types shall be tested. The highest output level shall be reported.
- c) Within the guidance given above, the listening devices shall be positioned to maximise the output.

A.1.3 Intra-concha listening devices

- a) If multiple earpieces are provided by a listening device, select the largest earpiece that fits in the concha of the ear simulator without excessive pressure being applied to the ear.
- b) If earpieces of multiple materials or styles are provided, test each material with the same earpiece size selected as above.

A.1.4 Insert type listening devices

- a) If multiple earpieces are provided, select one that fits snugly in the ear simulator without excessive pressure being applied to the ear.
- b) If earpieces of multiple materials or styles are provided, test each material with the same earpiece size selected as above.

A.2 Measurement and Analysis (General)

- a) Acoustic measurements from DRP on the HATS shall be transferred to diffuse field or 0-0 free field (0 degree azimuth and 0 degree elevation) via a minimum phase filter.
- b) RTA (real time analysis) analyser with 1/3 octave resolution and A-weighting shall be used.
- c) Any volume control, tone control or equalisation setting, if any, shall be adjusted to the setting that gives the maximum output.
- d) All acoustic output levels shall be determined using an averaging time of 30 second or more.
- e) The test result should be the numerical average of the five measurements.
 - 1) Example 1: If the five measurements are 73 mV, 77 mV, 75 mV, 79 mV, 77 mV, the test result should be $(73 + 77 + 75 + 79 + 77) / 5 = 76,2$ mV.
 - 2) Example 2: If the five measurements are 102 dB(A), 97 dB(A), 100 dB(A), 95 dB(A), 97 dB(A), the test result should be $(102 + 97 + 100 + 95 + 97) / 5 = 98,2$ dB(A).