

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Portable multimedia equipment – Determination of battery duration –
Part 2: Headphones and earphones with active noise-cancelling functions**

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**Matériel multimédia portable – Détermination de la durée des batteries –
Partie 2: Casques et écouteurs avec fonctions de réduction de bruit active**

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
4 Measuring method of battery duration.....	8
4.1 General.....	8
4.2 Test signal	8
4.3 Ambient noise signal.....	8
4.4 Standard conditions for measurement	9
4.4.1 General conditions for measurement	9
4.4.2 Test site	9
4.5 Test equipment	9
4.6 Preparation of headphones	9
4.6.1 Battery to be measured	9
4.6.2 Input setting.....	9
4.7 Test procedure for measurement of battery duration	10
4.7.1 Adjustment of test signal level	10
4.7.2 Adjustment of loudness of ambient noise signal.....	10
4.7.3 Measurement of battery duration	10
5 Characteristics to be specified	10
Annex A (informative) Verification procedure	11
A.1 General.....	11
A.2 Verification procedure	11
Bibliography.....	12
Figure 1 – Example of a battery duration measurement system.....	9
Figure A.1 – Flowchart, verification procedure	11

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**PORTABLE MULTIMEDIA EQUIPMENT –
DETERMINATION OF BATTERY DURATION –**
**Part 2: Headphones and earphones with
active noise-cancelling functions**

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IEC 63296-2 has been prepared by technical area 19: Environmental and energy aspects for multimedia systems and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

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

Draft	Report on voting
100/4049/FDIS	100/4080/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.

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.

A list of all parts in the IEC 63296 series, published under the general title *Portable multimedia equipment – Determination of battery duration*, can be found on the IEC website.

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,
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INTRODUCTION

This document specifies a measurement method for battery duration on active acoustic noise-cancelling headphones and earphones. Active acoustic noise-cancelling headphones and earphones are commonly used to reduce the ambient acoustic noise to which the ear is exposed. However, there is no International Standard for a battery duration measurement method of active acoustic noise-cancelling headphones and earphones. Until now, each company has evaluated the performance using its own method, and the evaluation values are not uniform.

This document for the measurement of the battery duration and the notation of measured value allows the comparison of performance data obtained in different locations.

The IEC 63296 series currently consists of the following parts:

- Part 1: Powered loudspeaker equipment
- Part 2: Headphones and earphones with active noise-cancelling functions

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PORTABLE MULTIMEDIA EQUIPMENT – DETERMINATION OF BATTERY DURATION –

Part 2: Headphones and earphones with active noise-cancelling functions

1 Scope

This document is applicable to active acoustic noise-cancelling headphones and earphones that have the function of reducing the ambient noise heard by the user by the level of the output sound from the transducer, which is generated by the ambient noise detection microphone and the noise reduction signal processing circuit.

This document covers headphones and earphones to be worn over-the-ear or in-ear, all of which are referred to as "headphones" in this document.

This document specifies the terms and definitions relating to battery duration of this type of headphones and the measurement and evaluation methods.

The noise detection microphones are mounted in the body, on the surface, or on an accessory of the headphones. Signal-processing circuits are analogue and digital electronic circuits.

This document does not deal with equipment intended for hearing protection. It is also not applicable to music players, recorders, etc. that have a noise-cancelling function.

The battery duration measurement methods can be applied to headphones having no active noise-cancelling function.

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

IEC 60268-7:2010, *Sound system equipment – Part 7: Headphones and earphones*

IEC 60268-24:2023, *Sound system equipment – Part 24: Headphones and earphones – Active acoustic noise cancelling characteristics*

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*

3 Terms and definitions

For the purposes of this document, the following terms and definitions including those of IEC 60268-7, IEC 60318-4, IEC 60318-7 and IEC 60268-24 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

earphone

electroacoustic transducer by which acoustic oscillations are obtained from electric signals and intended to be closely coupled acoustically to the ear

Note 1 to entry: For the purposes of the normative part of this document, the term "headphones" comprises the concept of earphones.

[SOURCE: IEC 60050-801:1994, 801-27-18, modified – Note to entry added.]

3.2

headphone

assembly of one or two earphones on a headband or chinband

Note 1 to entry: The earphone can be worn either over-the-ear (circum-aural, supra-aural or supra-concha) or in-ear (intra-concha, insert and insert with sound tube).

Note 2 to entry: The use of a headband or chinband can be optional with intra-concha earphones

Note 3 to entry: The audio signals can be provided either wireless or via cable.

Note 4 to entry: For the purposes of the normative part of this document, the term "headphones" comprises the concept of earphones.

[SOURCE: IEC 60050-801:1994, 801-27-20, modified – Notes 1 to 4 to entry have been added; "or chinband" added to the definition.]

3.3

ANC

active noise-cancellation

characteristic that reduces the ambient noise level in the user's ear canal by the level of the sound output of the transducer, which is generated by the noise detection microphone and the signal processing circuit

3.4

pink noise

noise whose power spectral density is inversely proportional to frequency

[SOURCE: IEC 60050-801:1994, 801-21-11]

3.5

HATS

head and torso simulator

simulator of a median adult human head and part of the torso, extending in total from the top of the head to the waist, and designed to simulate the sound pick-up characteristics and acoustic diffraction

3.6

ATF

acoustic test fixture

inanimate device that approximates certain physical characteristics and dimensions of a representative human head, pinnae, and ear canal and is used for measuring the insertion loss of ambient noise by a headphone

[SOURCE: ANSI/ASA S12.42, modified – In the definition, "of a hearing protection device" has been replaced with "of ambient noise by a headphone".]

3.7

input terminal

terminal for audio signal input

3.8

receiver

device for detecting radio-frequency radiation and extracting certain characteristics

[SOURCE: IEC 60050-713:1998, 713-10-02]

3.9

operating time

duration for which the headphone is in an operating state until the sound is interrupted, or abnormal operation is performed

Note 1 to entry: The state where the sound is interrupted is a state where the sound output from the speaker is stopped and does not include a state where the sound is distorted, or the sound pressure is low.

Note 2 to entry: An example of abnormal operation includes when the ANC stops working.

4 Measuring method of battery duration

4.1 General

The battery duration on the noise-cancelling headphones and earphones to be worn over-the-ear or in-ear (hereafter "headphones") is specified by measuring the operating time.

4.2 Test signal

The programme simulation noise specified in IEC 60268-1 is used as a signal equivalent to a music playback signal. The crest factor of the programme simulation noise shall be ranged between 1,8 and 2,2.

4.3 Ambient noise signal

One of the following three simulated ambient noises specified in IEC 60268-24:2023, 4.2.2:

- a) simulated aircraft cabin noise;
- b) simulated train compartment noise;
- c) simulated cafeteria noise;

or the pink noise shall be used. It is recommended to select the ambient noise according to the assumed use case.

4.4 Standard conditions for measurement

4.4.1 General conditions for measurement

- Temperature of 15 to 35 °C, preferably at 20 °C
- Relative humidity of 25 to 75 %
- Atmospheric pressure of 86 to 106 kPa

If the ambient conditions are outside these ranges, this shall be stated, and the actual conditions shall be specified (see IEC 60068-1:2013, 4.3).

4.4.2 Test site

Test site is specified in IEC 60268-24:2023, 4.3.1. An example of a battery duration measurement system is shown in Figure 1.

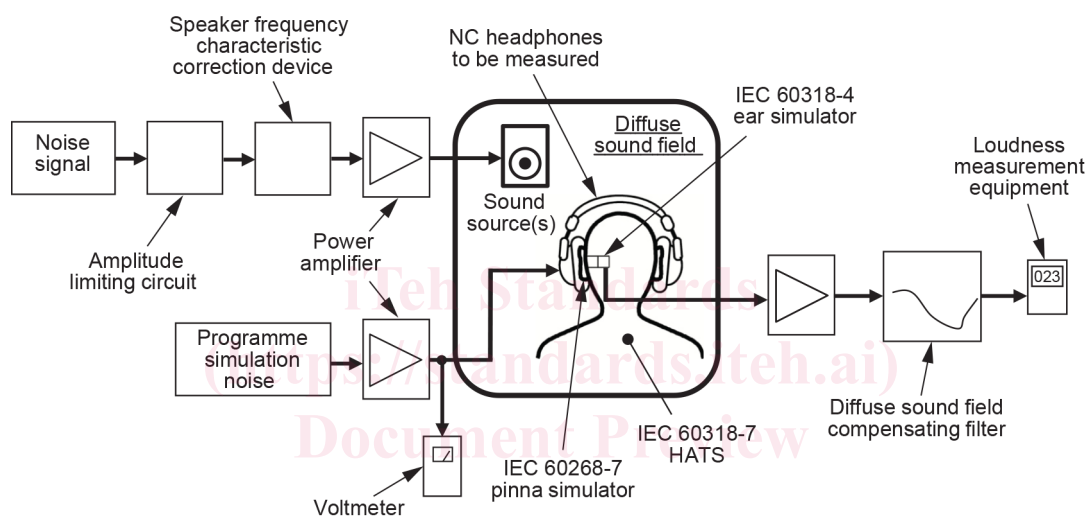


Figure 1 – Example of a battery duration measurement system

4.5 Test equipment

Play back equipment for ambient noise signals, HATS or ATF and analysis equipment are specified in IEC 60268-24:2023, 4.4.

4.6 Preparation of headphones

4.6.1 Battery to be measured

Primary batteries shall be unused with the standard capacity of the type specified by the manufacturer. Secondary batteries (rechargeable batteries) shall be those attached to the equipment or activated with a standard capacity of the type specified by the manufacturer (e.g. in the instruction manual). It shall be fully charged in accordance with the instruction manual of the equipment.

4.6.2 Input setting

For ANC headphones with an analogue wired connection, connect the cable to the input terminal and measure the battery duration as described in 4.7. Digital wired connections are not covered by this document. For ANC headphones providing a wireless connection, connect it to the receiver and measure as described in 4.7.

The battery duration of ANC headphones that support both analogue wired and wireless input shall be measured and documented in both conditions.