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NSAI Standards

Irish Standard
I.S. EN ISO 389-1:2018

Acoustics - Reference zero for the calibration of audiometric equipment - Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones (ISO 389-1:2017)

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National Foreword

I.S. EN ISO 389-1:2018 is the adopted Irish version of the European Document EN ISO 389-1:2018, Acoustics - Reference zero for the calibration of audiometric equipment - Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones (ISO 389-1:2017)

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 389-1

February 2018

ICS 13.140

Supersedes EN ISO 389-1:2000

English Version

Acoustics - Reference zero for the calibration of audiometric equipment - Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones (ISO 389-1:2017)

Acoustique - Zéro de référence pour l'étalonnage d'équipements audiométriques - Partie 1: Niveaux de référence équivalents de pression acoustique liminaire pour les écouteurs à sons purs supra-auraux (ISO 389-1:2017)

Akustik - Standard-Bezugspegel für die Kalibrierung audiometrischer Geräte - Teil 1: Äquivalente Bezugs-Schwellenschalldruckpegel für reine Töne und supra-aurale Kopfhörer (ISO 389-1:2017)

This European Standard was approved by CEN on 16 December 2017.

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European foreword

This document (EN ISO 389-1:2018) has been prepared by Technical Committee ISO/TC 43 “Acoustics” in collaboration with Technical Committee CEN/TC 211 “Acoustics” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2018, and conflicting national standards shall be withdrawn at the latest by August 2018.

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INTERNATIONAL STANDARD

ISO 389-1

Second edition
2017-12

Acoustics — Reference zero for the calibration of audiometric equipment —

Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones

Acoustique — Zéro de référence pour l'étalonnage d'équipements audiométriques —

Partie 1: Niveaux de référence équivalents de pression acoustique liminaire pour les écouteurs à sons purs supra-auraux

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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The committee responsible for this document is ISO/TC 43, *Acoustics*.

This second edition cancels and replaces the first edition (ISO 389-1:1998), which has been technically revised.

The main changes compared to the previous edition are as follows:

— data for additional models of earphone have been introduced;

— wording and definitions have been aligned with the current versions of standards in the field of audiology.

A current list of all parts in the ISO 389 series can be found on the ISO website.

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Introduction

Each document in the ISO 389 series specifies reference threshold levels for the calibration of audiometric equipment. This document is applicable to equipment for pure-tone air-conduction audiometry that uses supra-aural earphones.

In principle, reference equivalent threshold sound pressure levels (RETSPLs) would be rendered independent of earphone model if they were referred to an ear simulator having acoustical properties exactly simulating those of the average human ear. A device designed with this aim in view is standardized in IEC 60318-1. The original data for the ISO 389 series were presented in ISO 389:1985, Addendum 1, which was prepared based on an assessment of technical data provided by laboratories listed in Annex B on RETSPL values specified on the IEC 60318-1 ear simulator and covering a variety of earphone models. These data were analysed to produce a set of RETSPL values which are, within an acceptable uncertainty, applicable to earphones of any model within a broadly defined class. A note on the derivation of the standard values and the origin of the data input is given in Annex B for information.

In recent years, new supra-aural earphone models have been developed and other models have been revised. If applicable, their RETSPLs were specified both on the IEC 60318-1 ear simulator and the IEC 60318-3 acoustic coupler, as a result of direct threshold measurements under the preferred test conditions given in ISO 389-9. These model-specific RETSPL values are given in this document in separate tables, along with the IEC 60318-3 acoustic coupler RETSPLs for Telephonics TDH 39[1)] and Beyer DT 48[2)] earphones, which were adopted from the former editions of ISO 389.

1) TDH 39 is the name of a product supplied by Telephonics. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product name.

2) DT 48 is the name of a product supplied by Beyerdynamic. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named.

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Acoustics — Reference zero for the calibration of audiometric equipment —

Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones

1 Scope

This document specifies a standard reference zero for the scale of hearing threshold level applicable to pure-tone air conduction audiometers, to promote agreement and uniformity in the expression of hearing threshold level measurements throughout the world.

It states the information in a form suitable for direct application to the calibration of audiometers, that is, in terms of the reference equivalent threshold sound pressure levels of generic supra-aural earphones specified in 4.2, measured on an ear simulator complying with IEC 60318-1 and in terms of model-specific data given in two additional tables for the IEC 60318-3 acoustic coupler and the IEC 60318-1 ear simulator, respectively.

The data are based on an assessment of the information available from the various standardizing laboratories responsible for audiometric standards and from scientific publications.

Some notes on the application and derivation of the reference levels are given in Annexes A and B.

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 60318-1:2009, *Electroacoustics — Simulators of human head and ear — Part 1: Ear simulator for the measurement of supra-aural and circumaural earphones*

IEC 60318-3, *Electroacoustics — Simulators of human head and ear — Part 3: Acoustic coupler for the calibration of supra-aural earphones used in audiometry*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
air conduction
transmission of sound through the external and middle ear to the inner ear

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