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Second edition
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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

*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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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 39¹⁾ and Beyer DT 48²⁾ 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.