
Acoustics — Reference zero for the calibration of audiometric equipment —

Part 2:

Reference equivalent threshold sound pressure levels for pure tones and insert earphones

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

Partie 2: Niveaux de référence équivalents de pression acoustique liminaire pour les écouteurs à son purs et à insertion



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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 389-2 was prepared by Technical Committee ISO/TC 43, *Acoustics*.

ISO 389 consists of the following parts, under the general title *Acoustics* — *Reference zero for the calibration of audiometric equipment*:

- *Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones*
- *Part 2: Reference equivalent threshold sound pressure levels for pure tones and insert earphones*
- *Part 3: Reference equivalent threshold force levels for pure tones and bone vibrators*
- *Part 4: Reference levels for narrow-band masking noise*
- *Part 5: Reference equivalent threshold sound pressure levels for pure tones in the frequency range 8 kHz to 16 kHz*
- *Part 6: Reference equivalent threshold sound pressure levels for acoustic test signals of short duration*
- *Part 7: Reference threshold of hearing under free-field and diffuse-field listening conditions*

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Part 1 will be a re-issue of ISO 389:1991.

Annexes A and B of this part of ISO 389 are for information only.

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Introduction

Each part of International Standard ISO 389 specifies a specific reference zero for the calibration of audiometric equipment. ISO 389:1991 (to be re-issued as ISO 389-1) contains values of reference equivalent threshold sound pressure levels (RETSPL) for pure tones and two specified patterns of supra-aural earphones used in conjunction with an acoustic coupler conforming to IEC 303, and for other supra-aural earphones of specified patterns in conjunction with an artificial ear conforming to IEC 318. ISO 389-4 specifies reference levels for narrow-band masking noise based on these RETSPL data.

In some audiological applications it may, however, be desirable to use insert earphones to deliver either the test signal or the masking noise, e.g. to reduce the occlusion effect or interaural effects. RETSPL data for these kinds of earphone are specified in this part of ISO 389. It is based on an assessment of technical data provided by laboratories in different countries representing the most reliable data available at the time.

It is recognized that small differences may occur between results of hearing threshold level measurements obtained by audiometric equipment using different patterns of earphone, i.e. supra-aural or insert earphones.

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Acoustics — Reference zero for the calibration of audiometric equipment —

Part 2:

Reference equivalent threshold sound pressure levels for pure tones and insert earphones

1 Scope

This part of ISO 389 specifies reference equivalent threshold sound pressure levels (RETSPL) for the calibration of pure-tone audiometers supplementary to those specified in ISO 389:1991¹⁾. Values given in this part of ISO 389 are applicable to insert earphones of a pattern specified in clause 4.

NOTE 1 For information, a note on the derivation of the reference values and the origin of the data input is given in annex A, and a bibliography is given in annex B.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 389. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 389 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 389:1991, *Acoustics — Standard reference zero for the calibration of pure-tone air conduction audiometers.*¹⁾

IEC 126:1973, *IEC reference coupler for the measurement of hearing aids using earphones coupled to the ear by means of ear inserts.*

IEC 711:1981, *Occluded-ear simulator for the measurement of earphones coupled to the ear by ear inserts.*

3 Definitions

For the purposes of this part of ISO 389, the definitions given in ISO 389:1991 together with the following definitions apply.

3.1 ear insert: Device used to provide the acoustic coupling between an earphone and the ear canal.

NOTE 2 This may be, for example, an earmould or a similar device with or without a connecting tube.

3.2 insert earphone: Small earphone coupled to the ear canal by means of an ear insert, or attached to a connecting element which is inserted into the ear canal. The ear insert may be a part of the insert earphone.

3.3 ear simulator: Device for measuring the output sound pressure of an earphone under well-defined loading conditions in a specified frequency range. It consists essentially of a principal cavity, acoustic load networks and a calibrated microphone. The location of the microphone is chosen so that the sound pressure at the microphone corresponds approximately to the sound pressure existing at the human eardrum.

1) To be re-issued as ISO 389-1.