

Australian Standard<sup>®</sup>

**Acoustics—Audiometric test methods**

**Part 2: Sound field audiometry with  
pure tone and narrow-band test signals**



This Australian Standard® was prepared by Committee AV-003, Acoustics Human Effects. It was approved on behalf of the Council of Standards Australia on 2 December 2008. This Standard was published on 9 March 2009.

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The following are represented on Committee AV-003:

- Association of Accredited Certification Bodies
  - Association of Australian Acoustical Consultants
  - Association of Consulting Engineers Australia
  - Audiological Society of Australia
  - Australasian Faculty of Occupational & Environmental Medicine
  - Australian Acoustical Society
  - Australian Chamber of Commerce and Industry
  - Australian Council of Trade Unions
  - Australian Industry Group
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  - Department of Defence, Australia
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  - Victorian WorkCover Authority
  - WorkCover New South Wales
  - WorkSafe Division Department of Commerce Government of WA
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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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**Acoustics—Audiometric test methods**

**Part 2: Sound field audiometry with  
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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee AV-003, Acoustics Human Effects. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard is identical with, and has been reproduced from ISO 8253-2:1992, *Acoustics—Audiometric test methods, Part 2: Sound field audiometry with pure tone and narrow-band test signals*.

The objective of this Standard is to specify the relevant test signal characteristics, requirements for free, diffuse and quasi-free sound fields, and the procedures for sound field audiometry using pure tones, frequency modulated tones or other narrow-band test signals presented by means of one or more loudspeakers, primarily for the purpose of determining hearing threshold levels in the frequency range from 125 Hz to 12500 Hz.

Committee AV-003 agreed that the following sentence should be added to Clause 12, paragraph 1—It is recommended that for stages B and C the calibration be recorded and any non-compliance noted.

In addition, in Clause 6 and Table 2, a slow time constant should be used, as it is not specified if the measurement of  $L_{\max}$  for ambient noise is with a ‘slow’ or ‘fast’ time constant. This will make quite a difference if impulse noises are present.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text, ‘this part of ISO 8253’ should read ‘this Australian Standard’.
- (c) Substitute a full for a comma as a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian Standard</i>
ISO	AS
266 Acoustics—Preferred frequencies for measurements	2533 Acoustics—Preferred frequencies and band centre frequencies
	AS ISO
8253 Acoustics—Audiometric test methods	8253 Acoustics—Audiometric test methods
8253-1 Part 1: Basic pure tone air and bone conduction threshold audiometry	8253.1 Part 1: Basic pure tone air and bone conduction threshold audiometry
IEC	AS IEC
645 Audiometers	60645 Electroacoustics—Audiological equipment
645-1 Part 1: Pure tone audiometers	60645.1 Part 1: Pure-tone audiometers (IEC 60645-1:2001, MOD)
651 Sound level meters	61672 Electroacoustics—Sound level meters
	61672.2 Part 2: Pattern evaluation tests
	AS/NZS
225 Octave, half-octave and third-octave band filters intended for the analysis of sounds and vibrations	4476 Acoustics—Octave-band and fractional-octave-band filters

Only international references that have been adopted as an Australian or Australian/New Zealand Standard have been listed.

## INTRODUCTION

ISO 6189 and ISO 8253-1 cover procedures for the determination of thresholds of hearing using pure tones presented to the subject by means of earphone or bone vibrator.

This part of ISO 8253 covers procedures for the determination of thresholds of hearing in a sound field. In general, sound field testing implies binaural listening to a test signal, presented by means of one or more loudspeakers in a test room. The test signal may be a pure tone, a frequency-modulated tone or a narrow band of noise. The acoustical characteristics of the sound field are determined by the choice of test signal, by the number and acoustical properties of the loudspeakers used, as well as by the acoustical characteristics of the test room.

Sound field audiometry may be used for various purposes, for example the evaluation of hearing acuity in young children and the determination of the functional gain of a hearing aid when worn by a particular listener.

## AUSTRALIAN STANDARD

**Acoustics — Audiometric test methods —****Part 2:****Sound field audiometry with pure tone and narrow-band test signals****1 Scope**

This part of ISO 8253 specifies relevant test signal characteristics, requirements for free, diffuse and quasi-free sound fields, and procedures for sound field audiometry using pure tones, frequency modulated tones or other narrow-band test signals presented by means of one or more loudspeakers, primarily for the purpose of determining hearing threshold levels in the frequency range from 125 Hz to 12 500 Hz.

It does not include specifications for the use of hand-held loudspeakers.

Speech as a test signal is not covered.

The purpose of this part of ISO 8253 is to ensure that tests of hearing, using sound field audiometry, give as high a degree of accuracy and reproducibility as possible.

Examples of graphical representations of the results and a bibliography are given in annexes A and C.

**2 Normative references**

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8253. 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 8253 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 226:1987, *Acoustics — Normal equal-loudness level contours.*

ISO 266:1975, *Acoustics — Preferred frequencies for measurements.*

ISO 8253-1:1989, *Acoustics — Audiometric test methods — Part 1: Basic pure tone air and bone conduction threshold audiometry.*

IEC 225:1966, *Octave, half-octave and third-octave band filters intended for the analysis of sounds and vibrations.*

IEC 581-7:1986, *High fidelity audio equipment and systems; Minimum performance requirements — Part 7: Loudspeakers.*

IEC 645-1:1992, *Audiometers — Part 1: Pure tone audiometers.*

IEC 651:1979, *Sound level meters.*

**3 Definitions**

For the purposes of this part of ISO 8253, the following definitions apply.

**3.1 air conduction:** The transmission of sound through the external and middle ear to the internal ear.

**3.2 otologically normal person:** A person in a normal state of health who is free from all signs or symptoms of ear disease and from obstructing wax in the ear canals, and who has no history of undue exposure to noise.