

Australian Standard™

**Acoustics—Procedures for the  
measurement of real-ear acoustical  
characteristics of hearing aids**

This Australian Standard was prepared by Committee AV-003, Acoustics Human Effects. It was approved on behalf of the Council of Standards Australia on 23 May 2003 and published on 4 July 2003.

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The following are represented on Committee AV-003:

Association of Australian Acoustical Consultants  
Association of Consulting Engineers Australia  
Australian Acoustical Society  
Australian Chamber of Commerce and Industry  
Australian Hearing  
Department of Consumer & Employment Protection, WorkSafe Division, W.A.  
Department of Labour, New Zealand  
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## PREFACE

This Standard was prepared by the Australian members of 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, rather than an Australian/New Zealand Standard.

This Standard is identical with and has been reproduced from ISO 12124, *Acoustics—Procedures for the measurement of real-ear acoustical characteristics of hearing aids*.

The objective of this Standard is to specify procedures and requirements for measuring the real-ear acoustical characteristics of hearing aids. Its purpose is to ensure that the same measurements made on a given hearing aid on a given hearing aid give substantially the same results.

None of the documents referenced in this Standard have been adopted as Australian or Australian/New Zealand Standards.

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- (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 International Standard' should read 'this Australian Standard'.
- (c) A full point substitutes for a comma when referring to a decimal marker.

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## INTRODUCTION

The performance characteristics of hearing aids in actual use can differ significantly from those determined in accordance with standards such as IEC 60118-0 and IEC 60118-7, due to differing acoustical influence and coupling presented by individual ears. Measurement methods that take into account the acoustic coupling and the acoustical influence of the individual wearer on the performance of hearing aids are therefore important in the fitting of these devices. Such measurement methods have come to be known as "real-ear measurements" and are sometimes performed clinically in less than ideal acoustic environments. The accuracy and repeatability of measurements made under such conditions are complex functions of the sound field, the test environment, the nature of the test signal, the hearing aid under evaluation, the method of test signal control, the location of the sound source, the nature of the data acquisition, analysis and presentation, as well as the degree of subject movement permitted.

This International Standard details the terminology, test environment and test methods, and defines the necessary reference points to be used for the measurement of real-ear acoustical characteristics of hearing aids.

# Acoustics — Procedures for the measurement of real-ear acoustical characteristics of hearing aids

## 1 Scope

This International Standard specifies procedures and requirements for measuring the real-ear acoustical characteristics of hearing aids. Its purpose is to ensure that the same measurements made on a given hearing aid or a given human ear and a given hearing aid, following the procedures described and using equipment complying with the requirements of IEC 61669, give substantially the same results.

Measurements of real-ear acoustical characteristics of hearing aids which apply non-linear or analytical processing techniques are valid only for the test signals used and conditions employed. These measurements should be performed in accordance with the hearing aid manufacturer's recommendations as they may require specific test signals or test conditions outside the scope of this International Standard.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 8253-2, *Acoustics — Audiometric test methods — Part 2: Sound field audiometry with pure tone and narrow-band test signals*.

IEC 60942, *Electroacoustics — Sound calibrators*.

IEC 61669, *Electroacoustics — Equipment for the measurement of real-ear acoustical characteristics of hearing aids*.

## 3 Terms and definitions

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

### 3.1

#### test signal

acoustic signal at the field reference point

### 3.2

#### subject

person in whose ear canal the hearing aid performance is being characterized

### 3.3

#### subject test position

position with subject seated in a reproducible upright position with the head erect and the subject reference point located on the test axis at the working distance