AS IEC 61669—2003
IEC 61669:2001

Australian Standard™

Electroacoustics—Equipment for the measurement of real-ear acoustical characteristics of hearing aids

Standards Australia

This Australian Standard was prepared by Committee AV-003, Acoustics Human Effects. It was approved on behalf of the Council of Standards Australia on 14 March 2003 and published on 31 March 2003.

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 IEC 61669:2001, *Electroacoustics—Equipment for the measurement of real-ear acoustical characteristics of hearing aids*.

The objective of this Standard is to specify the general requirements for test equipment designed for use in measuring the real-ear acoustical characteristics of hearing aids and describes the terminology used.

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 International Standard' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

This Standard provides for the use of the following Australian/New Zealand Standards in place of particular International Standards referenced herein:

Reference to International Standard		*Australian/New Zealand Standard*	
IEC		AS/NZS	
60601	Medical electrical equipment	3200	Medical electrical equipment
60601-1	Part 1: General requirements for safety	3200.1.0	General requirements for safety—Parent Standard
60601-1-2	Part 1-2: General requirements for safety—Collateral Standard: Electromagnetic compatibility—Requirements and tests	3200.1.2	Part 1.2: general requirements for safety—Collateral Standard: Electromagnetic compatibility—Requirements and tests
60601-1-4	Part 1-4: General requirements for safety—Collateral Standard: Programmable electrical medical systems	3200.1.4	Part 1.4: General requirements for safety—Collateral Standard: Programmable electrical medical systems
60645	Audiometers	1591	Acoustics—Instrumentation for audiometry
60645-1	Part 1: Pure tone audiometers	1591.1	Part 1: Reference zero for the calibration of pure-tone bone conduction audiometers
		1591.2	Part 2: Reference zero for the calibration of pure-tone audiometers
ISO		AS	
266	Acoustics—Preferred frequencies	2533	Acoustics—Preferred frequencies and band centre frequencies

CONTENTS

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 acoustic influence and coupling presented by individual ears. Measuring methods that take into account the acoustic coupling and the acoustic influence of the individual wearer on the performance of hearing aids are therefore important in the fitting of these devices. Such measuring 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 specifies performance requirements separate from the test requirements to show conformity. Conformance to the specifications in this International Standard is demonstrated only when the result of a measurement, extended by the actual expanded uncertainty of measurement of the testing laboratory, lies fully within the tolerances specified in this International Standard extended by the values for U_{ma} given in table 1.

NOTES

AUSTRALIAN STANDARD

ELECTROACOUSTICS – EQUIPMENT FOR THE MEASUREMENT OF REAL-EAR ACOUSTICAL CHARACTERISTICS OF HEARING AIDS

1 Scope

This International Standard specifies the general requirements for test equipment designed for use in measuring the real-ear acoustical characteristics of hearing aids and describes the terminology used.

The purpose of this International Standard is to ensure that measurements of real-ear acoustical characteristics of a hearing aid on a given human ear, performed with different test equipment which comply with this International Standard using methods described in ISO 12124, shall give substantially the same results.

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 part of the ISO/IEC Directives 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.

IEC 60601-1, *Medical electrical equipment – Part 1: General requirements for safety*

IEC 60601-1-2, *Medical electrical equipment – Part 1: General requirements for safety – 2. Collateral standard: Electromagnetic compatibility – Requirements and tests*

IEC 60601-1-4, *Medical electrical equipment – Part 1: General requirements for safety – 4. Collateral standard: Programmable electrical medical systems*

IEC 60645-1, *Audiometers – Part 1: Pure tone audiometers*

IEC 60942, *Electroacoustics – Sound calibrators*

ISO 266, *Acoustics – Preferred frequencies*

3 Terms and definitions

For the purpose of this International Standard, the following terms and definitions apply:

3.1
test signal
acoustic signal at the field reference point