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Electroacoustics - Measurement of real-ear acoustical performance characteristics of hearing aids

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 06/16

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EN 61669

February 2016

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Supersedes EN 61669:2001

English Version

Electroacoustics - Measurement of real-ear acoustical performance characteristics of hearing aids (IEC 61669:2015)

Électroacoustique - Mesure des caractéristiques de performances acoustiques des appareils de correction auditive sur une oreille réelle (IEC 61669:2015)

Elektroakustik - Messung der Kenndaten von Hörgeräten am menschlichen Ohr (IEC 61669:2015)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

The text of document 29/886/FDIS, future edition 2 of IEC 61699, prepared by IEC/TC 29 "Electroacoustics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61699:2016.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-09-09
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-12-09

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Endorsement notice

The text of the International Standard IEC 61699:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60118-0	NOTE	Harmonized as EN 60118-0.
IEC 60118-7	NOTE	Harmonized as EN 60118-7.
IEC 60118-8	NOTE	Harmonized as EN 60118-8.
IEC 60118-15	NOTE	Harmonized as EN 60118-15.
IEC 60318-4	NOTE	Harmonized as EN 60318-4.

Annex ZA
(normative)
Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60318-5	-	Electroacoustics - Simulators of human head and ear -- Part 5: 2 cm³ coupler for the measurement of hearing aids and earphones coupled to the ear by means of ear inserts	EN 60318-5	-
IEC 60601-1	-	Medical electrical equipment -- Part 1: General requirements for basic safety and essential performance	EN 60601-1	-
IEC 60601-1-2	-	Medical electrical equipment -- Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic disturbances - Requirements and tests	EN 60601-1-2	-
IEC 60942	-	Electroacoustics - Sound calibrators	EN 60942	-
IEC 61260-1	-	Electroacoustics - Octave-band and fractional-octave-band filters -- Part 1: Specifications	EN 61260-1	-
ISO 266	-	Acoustics - Preferred frequencies	EN ISO 266	-
ISO 8253-2	-	Acoustics - Audiometric test methods - Part 2: Sound field audiometry with pure-tone and narrow-band test signals	EN ISO 8253-2	-
ISO/TR 25417	-	Acoustics_- Definitions of basic quantities and terms	-	-

IEC 61669

Edition 2.0 2015-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electroacoustics – Measurement of real-ear acoustical performance characteristics of hearing aids

Électroacoustique – Mesure des caractéristiques de performances acoustiques des appareils de correction auditive sur une oreille réelle

IEC 61669:2015-11(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROACOUSTICS – MEASUREMENT OF REAL-EAR ACOUSTICAL PERFORMANCE CHARACTERISTICS OF HEARING AIDS

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61669 has been prepared by IEC technical committee 29: Electroacoustics.

This second edition cancels and replaces the first edition of IEC 61669:2001 and the first edition of ISO 12124:2001. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 61669:2001 and ISO 12124:2001:

a) the addition of the International Speech Test Signal as a preferred speech-like stimulus;
b) definitions and test methods for the real-ear to dial difference;
c) definitions and test methods for the real-ear to coupler difference and
d) an annex dealing with issues in the measurement and application of the real-ear to coupler difference;

The text of this standard is based on the following documents:

FDIS	Report on voting
29/886/FDIS	29/893/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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 field source, the nature of the data acquisition, analysis and presentation as well as the degree of subject movement permitted.

This standard provides definitions for terms used in the measurement of real-ear performance characteristics of hearing aids, provides procedural and reporting guidelines, and identifies essential characteristics to be reported by the manufacturer of equipment used for this purpose. Acceptable tolerances for the control and measurement of sound pressure levels are indicated. Where possible, sources of error have been identified and suggestions provided for their management.

ELECTROACOUSTICS – MEASUREMENT OF REAL-EAR ACOUSTICAL PERFORMANCE CHARACTERISTICS OF HEARING AIDS

1 Scope

This International Standard gives recommendations and requirements for the measurement and estimation of the real-ear acoustical performance characteristics of air-conduction hearing aids and for the measurement of certain acoustic properties of the ear related to the application of hearing aids.

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.

The purpose of this standard is to ensure that measurements of real-ear acoustical performance characteristics of a given hearing aid on a given human ear can be replicated in other locations with other test equipment.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

IEC 60601-1-2, *Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – Requirements and tests*

IEC 60318-5, *Electroacoustics – Simulators of human head and ear – Part 5: 2 cm^3 coupler for the measurement of hearing aids and earphones coupled to the ear by means of ear inserts*

IEC 60942, *Electroacoustics – Sound calibrators*

IEC 61260-1, *Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications*

ISO 266, *Acoustics – Preferred frequencies*

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

ISO/TR 25417, *Acoustics – Definitions of basic quantities and terms*