Electroacoustics - Hearing aids - Part 15: Methods for characterising signal processing in hearing aids with a speech-like signal

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NATIONAL FOREWORD

See Eesti standard EVS-EN 60118-15:2012 sisaldab Euroopa standardi EN 60118-15:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 60118-15:2012 consists of the English text of the European standard EN 60118-15:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 13.04.2012.	Date of Availability of the European standard is 13.04.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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English version

Electroacoustics - Hearing aids - Part 15: Methods for characterising signal processing in hearing aids with a speech-like signal

(IEC 60118-15:2012)

Electroacoustique -
Appareils de correction auditive -
Partie 15: Méthodes de caractérisation du traitement des signaux dans les appareils de correction auditive avec un signal de type parole
(CEI 60118-15:2012)

Akustik -
Hörgeräte -
Teil 15: Methoden zur Charakterisierung der Hörgeräte-Signalverarbeitung
(IEC 60118-15:2012)

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CENELEC

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

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Foreword

The text of document 29/719/CDV, future edition 1 of IEC 60118-15, prepared by IEC/TC 29 "Electroacoustics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60118-15:2012.

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)	2012-12-27
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-03-27

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60118-15:2012 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 61669	NOTE	Harmonized as EN 61669.
IEC 60118-0:1983 + A1:1994	NOTE	Harmonized as EN 60118-0:1993 + A1:1994 (not modified).

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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60118-7	-	Electroacoustics - Hearing aids - Part 7: Measurement of the performance characteristics of hearing aids for production, supply and delivery quality assurance purposes	EN 60118-7	-
IEC 60118-8	2005	Electroacoustics - Hearing aids - Part 8: Methods of measurement of performance characteristics of hearing aids under simulated in situ working conditions	EN 60118-8	2005
IEC 60318-4	-	Electroacoustics - Simulators of human head and ear - Part 4: Occluded-ear simulator for the measurement of earphones coupled to the ear by means of ear inserts	EN 60318-4	-
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 61260	-	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	-

CONTENTS

INTRODUCTION

The characterisation 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. These standards use non speech-like test signals with the hearing aid set to specific settings which are, in general, not comparable with typical user settings.

This standard describes a recommended speech-like test signal, the International Speech Test Signal (ISTS), and a method for the characterisation of hearing aids using this signal with the hearing aid set to actual user settings or to the manufacturers' recommended settings for one of a range of audiograms. For the purposes of this standard the hearing aid is considered to be a combination of the physical hearing aid and the fitting software which accompanies it.

ELECTROACOUSTICS – HEARING AIDS –

Part 15: Methods for characterising signal processing in hearing aids with a speech-like signal

1 Scope

This part of IEC 60118 specifies a test signal designed to represent normal speech, the International Speech Test Signal (ISTS), together with the procedures and the requirements for measuring the characteristics of signal processing in air-conduction hearing aids. The measurements are used to derive the estimated insertion gain (EIG). For the purposes of characterizing a hearing aid for production, supply and delivery, the procedures and requirements to derive the coupler gain on a 2 cm^3 coupler as defined in IEC 60318-5 are also specified.

The procedure uses a speech-like test signal and the hearing aid settings are set to those programmed for an individual end-user or those recommended by the manufacturer for a typical end-user for a range of flat, moderately sloping or steep sloping audiograms, so that the measured characteristics are comparable to those which may be obtained by a wearer at typical user settings.

The purpose of this standard is to ensure that the same measurements made on a hearing aid following the procedures described, and using equipment complying with these requirements, give substantially the same results.

Measurements of the characteristics of signal processing in hearing aids which apply non-linear processing techniques are valid only for the test signal used. Measurements which require a different test signal or test conditions are outside the scope of this standard.

Conformance to the specifications in this 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 standard as given by the values given in 6.1.

Measurement methods that take into account the acoustic coupling of a hearing aid to the individual ear and the acoustic influence of the individual anatomical variations of an end-user on the acoustical performance of the hearing aid, known as real-ear measurements, are outside the scope of this particular standard.

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 60118-7, *Electroacoustics – Hearing aids – Part 7: Measurement of the performance characteristics of hearing aids for production, supply and delivery quality assurance purposes*

IEC 60118-8:2005, *Electroacoustics – Hearing aids – Part 8: Methods of measurement of performance characteristics of hearing aids under simulated in situ working conditions*

IEC 60318-4, *Electroacoustics – Simulators of human head and ear – Part 4: Occluded-ear simulator for the measurement of earphones coupled to the ear by means of ear inserts*

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 61260, *Electroacoustics – Octave-band and fractional-octave-band filters*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1
sound pressure level
all sound pressure levels specified are measured in decibels (dB) referenced to 20 µPa

3.2
percentile sound pressure level
sound pressure level, in dB, below which a certain percentage of the measured sound pressure levels fall, measured in a 125 ms time interval, over a stated measurement period

Note 1 to entry: As an example: The 30th percentile sound pressure level is the sound pressure level below which 30 % of the measured sound pressure levels are found, and the remaining 70 % of the measured sound pressure levels are higher.

Note 2 to entry: The 99th percentile may be interpreted as a peak sound pressure level indicator.

Note 3 to entry: The definition of percentile used here is according to general statistics. This definition may differ from other sciences such as acoustics.

3.3
international speech test signal
ISTS
speech-like test signal as defined in this standard

3.4
long term average speech spectrum
LTASS
sound pressure level measured in one-third-octave bands averaged over a long time period of speech

Note 1 to entry: For this standard a time period of 45 s is chosen.

3.5
occluded ear simulator
OES
ear simulator as defined in IEC 60318-4

3.6
estimated insertion gain of a hearing aid
EIG
estimate of the real-ear insertion gain as may be obtained across a group of persons

Note 1 to entry: This estimate is based on measurements of hearing aid gain using an occluded ear simulator or a 2 cm^3 coupler, as defined in IEC 60318-5.