SLOVENSKI STANDARD
SIST HD 450.3 S1:2004

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[Not translated]

Hearing aids - Part 3: Hearing aid equipment not entirely worn on the listener

Hörgeräte - Teil 3: Hörhilfen-Systeme, die nur zum Teil vom Benutzer getragen werden

Appareils de correction auditive - Partie 3: Systèmes de correction auditive non entièrement portés par l'auditeur

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HEARING AIDS
PART 3: HEARING AIDS EQUIPMENT NOT ENTIRELY WORN ON THE LISTENER

Appareils de correction auditive Troisième partie: Appareils de correction auditive non entièrement portés par l'auditeur

Hörgeräte. Teil 3: Hörhilfen-Systeme, die nur zum Teil vom Benutzer getragen werden

BODY OF HD

The Harmonization Document consists of:

- IEC 118-3 (1983) edition 2, IEC/TC 29, not appended

This Harmonization Document was approved by CENELEC on **11 September 1984.**

The English and French versions of this HD are provided by the text of the IEC publication and the German version is the official translation of the IEC text which is not yet available.

According to the CENELEC Internal Regulations the CENELEC member National Committees are bound:

to announce the existence of this Harmonization Document at national level

by or before **1985-03-01**

to publish their new harmonized national standard

by or before **1986-03-01**

and to to withdraw all conflicting national standards

by or before **1986-03-01.**

Harmonized national standards are listed on the HD information sheet, which is available from the CENELEC National Committees or from the CENELEC General Secretariat.

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Appareils de correction auditive

Troisième partie:
Systèmes de correction auditive non entièrement portés par l'auditor

Hearing aids

Part 3:
Hearing aid equipment not entirely worn on the listener

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HEARING AIDS

Part 3: Hearing aid equipment not entirely worn on the listener

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE TO THE FIRST EDITION

This standard has been prepared by IEC Technical Committee No.29: Electroacoustics.

The first draft was discussed at the meeting held in Gaithersburg in 1976. As a result of this meeting, a draft, Document 29(Central Office)108, was submitted to the National Committees for approval under the Six Months' Rule in June 1977.

The following countries voted explicitly in favour of publication:

Austria	Germany	Spain
Belgium	Japan	Sweden
Brazil	Netherlands	Switzerland
Czechoslovakia	Norway	Turkey
Denmark	Poland	United Kingdom
Egypt	Romania	United States of America
France	South Africa (Republic of)	

PREFACE TO THE SECOND EDITION

This second edition comprises the first edition, issued in 1979, and editorial amendments which are due to the issuing of IEC Publication 118-0 (1983).

Other IEC publications quoted in this standard:

Publications Nos. 65: Safety Requirements for Mains Operated Electronic and Related Apparatus for Household and Similar General Use.

118-0: Hearing Aids, Part 0: Measurement of Electroacoustical Characteristics.

268-3: Sound System Equipment, Part 3: Sound System Amplifiers.

268-4: Sound System Equipment, Part 4: Microphones.

303: IEC Provisional Reference Coupler for the Calibration of Earphones Used in Audiometry.

318: An IEC Artificial Ear, of the Wideband Type, for the Calibration of Earphones Used in Audiometry.

711: Occluded-ear Simulator for the Measurement of Earphones Coupled to the Ear by Ear Inserts.

HEARING AIDS

Part 3: Hearing aid equipment not entirely worn on the listener

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Introduction

In the rehabilitation of persons having impaired hearing, use is made of two types of electroacoustic amplification systems:

a) Hearing aids entirely worn on the listener.

b) Hearing aid equipment in which the microphone or microphones are not worn on the listener.

IEC Publication 118-0: Hearing Aids, Part 0: Measurement of Electroacoustical Characteristics, gives details of methods of measurements on hearing aids and in general covers the requirements for other hearing aid equipment.

However, measurements on hearing aid equipment involve certain test differences which are detailed in this standard. Reference is made wherever possible to IEC Publication 268: Sound System Equipment, for measurements not covered in IEC Publication 118-0.

1. Scope

The purpose of this standard is to describe a method of determining the overall electroacoustic performance of hearing aid equipment not entirely worn on the listener, used in the rehabilitation of persons having impaired hearing.

2. Object

The methods specified in this publication give information on the measurement of those parameters that are not fully covered in IEC Publication 118-0; i.e.:

Frequency response.
Air to air gain.
Acoustic output.
Gain and output controls.
Internal noise of the equipment.
Electrical input sensitivity and output power.
Overall effect of transmission paths in systems where the microphone(s) is (are) not connected by wire to the earphone(s).

Measurements other than the above are specified in IEC publications, for example IEC Publication 118-0 and IEC Publication 268.

3. Test equipment

3.1 *General*

Throughout this standard, all sound pressure levels specified are referred to 20 μPa. All voltage level measurements are referred to 1 V. All results can be given as r.m.s. values.

Note. – With non-sinusoidal signals appreciable measuring errors can arise when using instruments which measure mean values but are calibrated in r.m.s. terms.

3.2 *Acoustic requirements for testing microphones*

The microphone shall be placed in an acoustic test field in accordance with IEC Publication 268-4: Part 4: Microphones, under the stated conditions appropriate to the microphone used and connected to the amplifying system. Where the microphone is separate from the amplifier, only the microphone shall be placed in the acoustic test field. Where the microphone is an integral part of a main unit, the whole unit shall be placed in the sound field.

The method of measurement shall be described in the test report.

3.3 *Acoustic couplers*

IEC Publication 318: An IEC Artificial Ear, of the Wideband Type, for the Calibration of Earphones Used in Audiometry, describes the preferred device for measuring the acoustic output of supra-aural earphones.

IEC Publication 303: IEC Provisional Reference Coupler for the Calibration of Earphones Used in Audiometry, describes an acoustic coupler for supra-aural earphones which may be used if a device conforming to IEC Publication 318 is not available.

Note. – Until specifications are available for an agreed method and device for measuring the performance of circumaural earphones on an acoustic coupler, these measurements should be accompanied by a detailed description of the method of mounting and coupling the earphone on the acoustic coupler. If loudness balance techniques are used to establish the performance of earphones, the method should be stated.

IEC Publication 711: Occluded-ear Simulator for the Measurement of Earphones Coupled to the Ear by Ear Inserts, describes a suitable coupler for earphones of the insert type.

Reported measurements must state the coupler or artificial ear used.

4. Test procedure

The characteristics measured are valid only for a stated combination of microphones, amplifiers and earphones. For reference purposes, measurements shall be made with one microphone and one earphone and then with the maximum number of earphones and microphones to be used with the equipment.

4.1 *Normal operating conditions for equipment*

The normal conditions for measurements prescribed are as in IEC Publication 118-0, where relevant, and in addition:

a) The frequency range for test purposes shall be extended where possible from 100 Hz to 8 000 Hz.

b) The output attenuator, where fitted, shall be set to a stated position.

c) The setting of the tone controls shall be stated; if normal positions of these controls are indicated, these shall be used.

d) Where more than one earphone is connected, earphones not on the test coupler should be acoustically loaded in an appropriate manner.

e) Because of the possible size of the unit housing the microphone, special attention should be given to using adequate separation from the sound source and in general the substitution method should be used (see IEC Publication 118-0).

f) If a visual monitoring device is provided, it should be set as in Sub-clause 4.8.

4.2 *Basic frequency response*

A frequency response curve is to be obtained in the following manner:

a) The controls shall be set as in Sub-clause 4.1. Where a monitoring device is included, see Sub-clause 4.8.

b) The earphone shall be connected to the acoustic coupler without leakage.

c) The frequency response shall be the sound pressure level in the acoustic coupler measured as a function of frequency for an input sound pressure level of 60 dB as described in IEC Publication 118-0.

An additional measurement shall be made with an input sound pressure level of 90 dB. The gain control should be adjusted to give normal operating conditions.

4.3 *Maximum acoustic gain*

To be measured as in IEC Publication 118-0. See also Sub-clause 4.8 of this standard.

4.4 *Output attenuator*

Output attenuators may be either of the discrete step or continuously variable type. The purpose of this test is to determine the accuracy of the attenuator steps where stated. The test conditions shall be as in Sub-clauses 4.1 and 4.8. The sound pressure level in the coupler shall be measured for the maximum setting of the output control. The measurement shall then be repeated at each setting of the control, or if a continuously variable control is used, at each marked interval. The difference in sound pressure level between each position and the maximum setting of this control shall be noted.

4.5 *Internal noise*

The purpose of this test is to determine the internal electrical noise from the equipment. The recommended test procedure is as described in IEC Publication 118-0. Levels of hum at 50/60 Hz and 100/120 Hz shall be stated separately as sound pressure levels in the coupler.

Note. – It will be necessary to use a filter system, for example octave or third-octave, to ensure accurate measurements of the hum components. See IEC Publication 268-3, Part 3: Sound System Amplifiers.

4.6 *Electrical input sensitivity*

Where an electrical signal is to be fed into the equipment from an external source, i.e. tape recorder, etc., the following conditions shall be stated: