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Hearing aids - Part 9: Methods of measurement of characteristics of hearing aids with bone vibrator output

Hörgeräte - Teil 9: Verfahren zur Messung der Übertragungseigenschaften von Knochenleitungshörgeräten

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Appareils de correction auditive - Partie 9: Méthodes de mesure des caractéristiques des appareils de correction auditive à sortie par ossivibrateur

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HEARING AIDS
PART 9: METHODS OF MEASUREMENT OF CHARACTERISTICS OF HEARING AIDS WITH BONE VIBRATOR OUTPUT

Appareils de correction auditive
Neuvième partie: Méthodes de mesure des caractéristiques des appareils de correction auditive à sortie par ossivibrateur

Hörgeräte
Teil 9: Verfahren zur Messung der Übertragungseigenschaften von Knochenleitungshörgeräten

BODY OF THE HD

The Harmonization Document consists of:

- IEC 118-9 (1985) ed 1; IEC/TC 29, not appended

This Harmonization Document was approved by CENELEC on 1987-06-15.

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to publish their new harmonized national standard **by or before 1988-06-30**

to withdraw all conflicting national standards **by or before 1988-06-30.**

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Hearing aids

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Part 9:
Methods of measurement of characteristics of hearing aids with bone vibrator output

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HEARING AIDS

Part 9: Methods of measurement of characteristics of hearing aids with bone vibrator output

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.

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PREFACE

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

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

Six Months' Rule	Report on Voting
29(CO)133	29(CO)137

Further information can be found in the Report on Voting, indicated in the table above.

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HEARING AIDS

Part 9: Methods of measurement of characteristics of hearing aids with bone vibrator output

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INTRODUCTION

IEC Publication 118-0: Hearing Aids, Part 0: Measurement of Electroacoustical Characteristics, gives information on methods of test for air conduction hearing aids. The majority of hearing aids in use are of this type but a small percentage use a bone vibrator instead of an earphone. The use of a bone vibrator requires a different method of measuring the output from the hearing aid and also makes it impractical to measure amplification directly in terms of acoustic gain.

Amplification in the case of an air conduction hearing aid is expressed as the difference between the output sound pressure level in an acoustic coupler or ear simulator and the input sound pressure level measured in a specified manner. However, with bone conduction hearing aids the input is in terms of sound pressure level but the output will be in terms of mechanical vibration measured as an alternating force or force level.

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This standard defines a method of expressing the input/output ratio as an acousto-mechanical sensitivity level measured on a mechanical coupler according to the second edition of IEC Publication 373: Mechanical Coupler for Measurements on Bone Vibrators.

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By means of information provided in this standard the performance of hearing aids with bone vibrator outputs which do not form an integral part of the hearing aid for example body worn hearing aids, may be measured in a similar manner to aids with air conduction outputs as described in IEC Publication 118-0.

Where the bone vibrator forms an integral part of the hearing aid, or where it is attached in some fixed manner to the hearing aid (e.g. a headband type bone conduction hearing aid), performance cannot be measured in the same way as for body-worn aids, due to the large dimensions of the mechanical coupler having to be in contact with the spectacle arm. This standard recommends a pressure method of controlling the input sound pressure level, to the hearing aid microphone.

The second edition of IEC Publication 373, describes the means of measuring the output from a bone vibrator.

1. Scope

This standard specifies methods of measurement of the characteristics of hearing aids using bone vibrator output.

2. Object

The methods described will produce a suitable basis for the exchange of information or for direct comparison of the electroacoustical characteristics of hearing aids using bone vibrator output. These methods are chosen to be practical and reproducible and are based on selected fixed parameters.

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The results obtained by the methods specified herein express the performance under the conditions of the test, but will not necessarily agree exactly with the performance of the hearing aid under practical conditions of use.

3. General

3.1 Throughout this standard all sound pressure levels specified are referred to 20 μPa. When appropriate, sound pressure level will be abbreviated to SPL.

3.2 In this standard, reference is made to the following IEC publications:

Publication 68: Basic Environmental Testing Procedures.

Publication 118-0 (1983): Hearing Aids, Part 0: Measurement of Electroacoustical Characteristics.

Publication 118-7 (1983): Hearing Aids, Part 7: Measurement of the Performance Characteristics of Hearing Aids for Quality Inspection for Delivery Purposes.

Publication 263 (1982): Scales and Sizes for Plotting Frequency Characteristics and Polar Diagrams.

Publication 373 (–): Mechanical Coupler for Measurements on Bone Vibrators.

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4. Explanation of terms

Terms other than those used in IEC Publication 118-0 are given below.

4.1 *Bone vibrator*

An electromechanical transducer intended to produce the sensation of hearing by vibrating the cranial bones.

4.2 *Mechanical coupler*

A device designed to present a specified mechanical impedance to a vibrator applied with a specified static force and equipped with a mechano-electric transducer to enable the alternating force level at the surface of contact between vibrator and mechanical coupler to be determined.

4.3 *Vibratory force level (force level)*

Twenty times the logarithm to the base 10 of the ratio of the r.m.s. value of the force transmitting the vibration to the reference value of 1 micronewton (1 μN), expressed in decibels.

4.4 *Output force level (OFL)*

The vibratory force level produced at a specified frequency on a mechanical coupler by the bone vibrator of the hearing aid under test.