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Electroacoustics – Audiometric equipment – Part 6: Instruments for the measurement of otoacoustic emissions

INTERNATIONAL
ELECTROTECHNICAL
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NOTE FROM TC/SC OFFICERS:

CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	8
4 Requirements for specific instruments	9
5 General specifications	9
5.1 Acoustic stimulus system	9
5.1.1 General requirements	9
5.1.2 Stimulus types	9
5.1.3 Stimulus frequency range	10
5.1.4 Stimulus level	10
5.1.5 Intermodulation distortion	11
5.2 Test quality assuring system	11
5.2.1 Stability of acoustic response in the external auditory meatus	11
5.2.2 Test quality assurance	11
5.2.3 Individual stimulus recordings	11
5.3 Measuring system	12
5.3.1 Units of measurement	12
5.3.2 Measurement range	12
5.3.3 Accuracy of measurement	12
5.3.4 Frequency range	12
5.3.5 Noise reduction	12
5.3.6 Response detection	12
5.3.7 Response quality estimates	12
5.3.8 Normative values	12
5.4 Presentation of results	12
6 Demonstration of conformity with specifications	13
6.1 General	13
6.2 Probe signal	13
6.2.1 Probe signal frequency spectrum	13
6.2.2 Probe signal level and harmonic distortion	13
6.2.3 Probe measurement accuracy	13
6.3 Complete system	14
6.4 Maximum permitted expanded uncertainty of measurements U_{max}	14
7 General requirements	15
7.1 Marking	15
7.2 Instruction manual	15
7.3 Safety requirements	15
7.4 Immunity to power and radiofrequency fields	15
7.5 Warm-up time	15
7.6 Voltage supply variation and environmental conditions	16
7.6.1 Mains operation	16
7.6.2 Battery operation	16
7.6.3 Environmental conditions	16

8	Additional characteristics to be specified by the manufacturer	16
9	Periodic calibration	16
	Bibliography.....	17
	Table 1 – Mandatory functions for otoacoustic emission instruments.....	9
	Table 2 – Documentation of test conditions, parameters and results	13
	Table 3 – Values of U_{\max} for conformance and periodic calibration measurements	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROACOUSTICS – AUDIOMETRIC EQUIPMENT –

Part 6: Instruments for the measurement of otoacoustic emissions

FOREWORD

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IEC 606045-6 has been prepared by IEC technical committee 29: Electroacoustics. It is an International Standard.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the nominal test frequency used in DPOAE is now defined as the higher of the two frequencies, f_2 ;
- b) the permitted deviation of the stimulus signal for TEOAE has been specified;
- c) the frequency range for DPOAE stimulus signals has been redefined,
- d) the stimulus level requirements for TEOAE have been redefined;
- e) the stimulus level requirements for DPOAE have been redefined;

- f) the harmonic distortion requirements for DPOAE have been redefined;
- g) a minimum measurement range for DPOAE has been added.

The text of this International Standard is based on the following documents:

Draft	Report on voting
29/XX/FDIS	29/XX/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at <http://www.iec.ch/standardsdev/publications>.

A list of all parts in the IEC 60645 series, published under the general title *Electroacoustics – Audiometric equipment*, can be found on the IEC website.

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

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

INTRODUCTION

Developments in the field of diagnostic hearing measurement have resulted in a number of instruments designed to evaluate the otoacoustic emissions of the human ear. Such emissions may be evoked by acoustic test signals having different spectral and temporal characteristics.

The practical use of such instruments concerns the measurement of sound energy emitted by the inner ear and its separation from sounds emerging from physiological or other sources.

The spontaneous otoacoustic emissions (SOAE) and stimulus frequency otoacoustic emissions (SFOAE), which comprise part of the otoacoustic emissions, are not covered by this document.

Conformance to the performance specification in this document is demonstrated when a measured deviation from a design goal equals or does not exceed the corresponding acceptance limit(s), and the laboratory has demonstrated that the associated uncertainty of measurement equals or does not exceed the maximum permitted uncertainty specified in this document.

ELECTROACOUSTICS – AUDIOMETRIC EQUIPMENT –

Part 6: Instruments for the measurement of otoacoustic emissions

1 Scope

This part of IEC 60645 applies to instruments designed primarily for the measurement of otoacoustic emissions in the human external auditory meatus evoked by acoustic probe stimuli. This document defines the characteristics to be specified by the manufacturer, specifies minimum mandatory functions for two types of instruments and provides performance specifications applicable to both instrument types. This document describes methods to be used to demonstrate conformance with the specifications in this document and guidance on methods for periodic calibration.

The purpose of this document is to ensure that measurements made under comparable test conditions with different instruments complying with this document will be consistent. Instruments can provide a measurement function not specifically within the scope of this document and still comply with the relevant requirements of this document for the functions that are within the scope. This document is not intended to restrict development or incorporation of new features, nor to discourage innovative approaches.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 cm³ coupler for the measurement of hearing aids and earphones coupled to the ear by means of ear inserts*

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 60645-1:2017, *Electroacoustics – Audiometric equipment – Part 1: Equipment for pure-tone and speech audiometry*

IEC 60645-3:2020, *Electroacoustics – Audiometric equipment – Part 3: Test signals of short duration*

ISO/IEC Guide 98-3, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*