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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 7341.5-2018

**Electroacoustics -- Audiometric equipment -- Part 5:
Instruments for the measurement of aural acoustic
impedance/admittance**

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Foreword

GB/T 7341 "Electrical Acoustic Audiometry Equipment" is divided into the following parts.

- Part 1. Pure tone audiometer;
- Part 2. Language audiometry equipment;
- Part 3. Short continuous auditory test signals for audiometry and neurology;
- Part 4. Extending high-frequency audiometry equipment;
- Part 5. Measuring instruments for otoacoustic impedance/admittance;
- Part 6. Measuring instruments for otoacoustic emissions;
- Part 7. Measuring instruments for auditory brainstem response.

This part is the fifth part of GB/T 7341.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 15953-1995 "Earing Impedance/Admittance Measuring Instrument". Compared with GB/T 15953-1995, mainly

The technical content changes as follows.

- Modify the "probe buckle" to "ear plug" (see 3.13 and 1995 version 3.13);
- Revised the contents of Chapter 4 and listed it as Chapter 10 (see Chapter 10 and Chapter 4 of the 1995 edition);

- Revised the contents of Chapter 5, and modified 5.1 into Chapter 4 (see Chapter 4 and Chapter 5 of the 1995 edition);
- Revised the contents of Chapter 6, and revised 6.1.2 to Appendix C (see Appendix C and Chapter 6 of the 1995 edition);
- Increased measurement expansion uncertainty and maximum allowable value content (see 6.6);
- Added an overview of Chapter 7 (see 7.1);
- Modified the contents of 8.3 (see 8.3 and 1995 edition 8.3).

This part uses the translation method equivalent to IEC 60645-5:2004 "Electrical Acoustic Audiometry Equipment Part 5. Otoacoustic Impedance/Admittance measuring instrument".

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

GB -9706.1-2007 Medical electrical equipment - Part 1. General requirements for safety (IEC 60601-1:1988 A1:1991

A2:1995, IDT)

Introduction

In the field of audiometry and diagnostics, a series of specially designed instruments are used with their sound detection signals with different frequency and time characteristics.

No. to evaluate the acoustic impedance/admittance of the human ear. The practical application of such instruments is largely related to the measurement of otoacoustic impedance/admittance changes.

Otoacoustic impedance/admittance changes are caused by changes in the air pressure of the external auditory canal or by excitation of the middle ear muscles.

Electroacoustic audiometry equipment

Part 5. Measuring instruments for otoacoustic impedance/admittance

1 Scope

This part of GB/T 7341 specifies the performance of three types of otoacoustic impedance/admittance measuring instruments and the facilities provided for these instruments.

Conditions, and test methods used for acceptance testing and to guide routine calibration.

This section applies to instruments that measure the acoustic impedance/admittance in the external auditory canal using the specified pure tone detection signal. It is also suitable for other explorations.

This type of instrument for measuring signals.

This section is intended to ensure consistency with all types of instruments in this section under comparable test conditions. This section is not intended to constrain new features

The development or introduction does not hinder the innovation of technical methods.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 7341.1-2010 Electroacoustic audiometry equipment - Part 1. Pure tone audiometer (IEC 60645-1:2001, IDT)

IEC 60126 IEC reference coupler for measuring hearing aids using earphones that are plugged in with the human ear (IEC reference)

Coupler for the measurement of hearing aids using earphones coupled to the ear by means of ear inserts) 1)

IEC 60601-1 Medical electronic devices - Part 1. General safety requirements (Medical electrical equipment - Part 1.

General requirements for safety)

IEC 60601-1-2 Medical electronic devices - Part 1-2. General safety requirements Secondary standard. Electromagnetic compatibility requirements and testing

(Medical electrical equipment - Part 1-2.

General requirements for safety - Colateral standard. Elec-

tromagnetic compatibility - Requirements and tests)

IEC 60601-1-4 Medical electronic devices - Part 1-4. General safety requirements

(Medical electrical equipment - Part 1-4. General requirements for safety - Colateral standard. Programmable electrical medical systems)

BIPM/IEC /IFCC/ISO /IUPAC/IUPAP/OIML Guidance for the Expression of Measurement Uncertainty [Guide to the

Expression of uncertainty in measurement (GUM)].

1) The subsequent revision will be IEC 60318-5.

3 Terms and definitions

The following terms and definitions apply to this document.

Note. The units in this section are consistent with the International System of Units (SI) units, but the audiology test results are often used to other units in order to convert them.

Into the International System of Units (SI) unit, special preparation of Appendix B.

3.1

Ear impedance/admittance aural impedance/admittance

A generic term covering all aspects of otoacoustic impedance/admittance.

Note. In addition to the special provisions of the document, this part uses ear impedance/admittance as a general term, which covers all aspects of otoacoustic impedance/admittance.

3.2

Acoustic impedance acoustic impedance

The ratio of the sound pressure to the volumetric velocity through the surface at a defined surface.

Note 1. The symbol is Z_a , and the unit is Pas per cubic meter ($\text{Pa}\cdot\text{s}/\text{m}^3$).

Note 2. The amount usually measured is the modulus.

3.3

Acoustic resistance

The real component of the complex acoustic impedance.

Note. The symbol is R_a , and the unit is Pas per cubic meter ($\text{Pa}\cdot\text{s}/\text{m}^3$).

3.4

Acoustic reactance

The imaginary component of the complex acoustic impedance.

Note. The symbol is X_a and the unit is Pas per cubic meter ($\text{Pa}\cdot\text{s}/\text{m}^3$).

3.5

Acoustic admittance acoustic admittance