

ICS 13.340.20

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

GB/T 7584.6-2026

**Acoustics - Hearing protectors - Part 6: Determination of sound
attenuation of active noise reduction earmuffs**

声学 护听器 第6部分：主动降噪耳罩声衰减的测定

(English Translation)

Issued on: February 27, 2026

Implemented on: September 1, 2026

Issued by: State Administration for Market Regulation

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 6 of GB/T (Z)7584 "Acoustic Hearing Protectors". GB/T (Z)7584 has the following parts published.

---Part 1: Subjective Methods for Sound Attenuation Measurement;

---Part 2: Effective A-weighted sound pressure level estimation when wearing hearing protection;

---Part 3: Measurement of Insertion Loss of Over-Ear Hearing Protectors Using Dedicated Acoustic Testing Equipment;

---Part 5: Methods for evaluating noise attenuation by inexperienced subjects wearing the device;

---Part 6: Measurement of sound attenuation in active noise-canceling earmuffs.

This document is equivalent to ISO 4869-6:2019 "Acoustic hearing aids - Part 6: Determination of sound attenuation of active noise-canceling earmuffs".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Chinese Academy of Sciences.

This document is under the jurisdiction of the National Acoustics Standardization Technical Committee (SAC/TC17).

Introduction

Hearing protectors are typically used to reduce noise exposure to the ears. Based on their construction, hearing protectors can be classified into earplugs, earmuffs, and helmets, among others.

According to their working method, hearing protectors can be divided into passive noise cancellation (also known as passive noise cancellation) and active noise cancellation (also known as active noise cancellation).

GB/T (Z)7584 "Acoustic Hearing Protectors" aims to specify a standardized method for measuring the sound attenuation of hearing protectors, so as to compare similar conditions in different situations.

The product performance data obtained under the specified conditions are compared. GB/T (Z)7584 is proposed to consist of 6 parts.

---Part 1: Subjective Methods for Measuring Sound Attenuation. The aim is to specify the methods for measuring the sound attenuation of hearing aids at the hearing threshold under laboratory conditions.

The subjective method of reduction.

---Part 2: Effective A-weighted sound pressure level estimation while wearing hearing aids. The aim is to provide several estimation methods based on Part 1.

The sound attenuation test results are used to assess the equivalent exposure sound pressure level experienced when wearing hearing protectors.

---Part 3: Measurement of Insertion Loss of Over-Ear Hearing Protectors Using Dedicated Acoustic Testing Equipment. The purpose is to conduct specialized acoustic testing...

The equipment is standardized so that product performance consistency can be investigated in product type approval or certification procedures.

---Part 4: Measurement of the effective sound pressure level of the acoustic restoration earmuffs in relation to sound level. The purpose is to specify the acoustics used in Part 3.

A physical testing method for determining the sound level-dependent acoustic restoration earmuff attenuation using a testing device or head and torso simulator.

---Part 5: Methods for evaluating noise attenuation through inexperienced participants wearing the device. The aim is to provide an assessment of noise attenuation in occupational environments.

Methods for measuring the sound attenuation performance of a body system (including hearing protectors, subjects, wearers, and instructors).

---Part 6: Measurement of Sound Attenuation in Active Noise-Canceling Hearing Muffs. The aim is to provide information on the active insertion loss of active noise-canceling hearing muffs.

Loss testing methods and total sound attenuation calculation methods.

Active noise-canceling earmuffs provide additional acoustic attenuation of external noise by incorporating noise cancellation circuitry. This additional acoustic attenuation is typically effective for low frequencies.

More effective at reducing noise. These earcups are suitable for use in high-noise environments where low-frequency components are dominant. This is because the system has [a certain effect] when the noise cancellation circuit is activated.

Electrical noise or other possible noise can interfere with the subject's judgment of hearing threshold; therefore, the subjective methods specified in Part 1 are not applicable to testing hearing protection.

This document provides a test method for the active insertion loss of active noise-canceling over-ear hearing aids and a calculation method for total sound attenuation.

method.

Acoustic Hearing Protectors Part 6: Active Noise Cancelling Earmuffs Measurement of sound attenuation

1 Scope

This document specifies the active insertion loss test method and the calculation steps for obtaining the total sound attenuation for active noise cancellation (ANR) earmuffs.

To achieve this goal, it is also necessary to know and measure the sound attenuation in passive mode according to ISO 4869-1. These methods are applicable to steady-state noise.

Exposure, not applicable to noise containing impulse components.

The test methods described in this document use the passive real-ear hearing threshold attenuation (RAET) method as specified in ISO 4869-1 and ISO 11904-1.

And the active real-ear built-in microphone technique (MIRE technique) takes into account the acoustic interaction between the wearer and the device.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

ISO 4869-1 Acoustics - Hearing protectors - Part 1: Subjective method for measuring sound attenuation Note. GB/T 7584.1-2026 Acoustic hearing aids - Part 1: Subjective method for measuring sound attenuation (ISO 4869-1:2018, IDT) ISO 4869-2 Acoustic hearing aids - Part 2: Effective A-weighted sound pressure level estimation when wearing hearing aids protectors are worn) Note. GB/T 7584.2-2026 Acoustic hearing protection - Part 2: Effective A-weighted sound pressure level estimation when wearing hearing protection (ISO 4869-2:2018) IDT) ISO 11904-1 Acoustics - Measurement of intensity of sound emanating from near-ear sources - Part 1: Technology of real-ear microphones (MIRE technology) Note. GB/T 20441.4-2006 Measuring Microphones Part 4: Standard Operating Microphone Specifications (IEC 61094-4:1995, IDT)

3 Terms and Definitions

The terms and definitions defined in ISO 4869-1, ISO 4869-2, and ISO 11904-1, as well as the following terms and definitions, apply to this document.

The URLs for the terminology databases maintained by IEC and ISO for standardization are as follows.

Earmuffs that provide additional sound attenuation to external noise by incorporating noise cancellation circuitry.