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

GB/T 44804-2024

**Acoustics - Statistical distribution of hearing thresholds of
otologically normal persons in the age range from 18 years to
25 years under free-field listening conditions**

声学 自由场条件下18岁至25岁耳科正常人听力阈值的统计分布

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is equivalent to ISO 28961:2012 "Statistical analysis of hearing thresholds of normal otologists aged 18 to 25 years under acoustic free-field conditions" distributed".

Introduction

GB/T 4963-2007 and GB/T 4854.7-2008 stipulate the hearing of normal otological subjects aged 18 to 25 in a free sound field.

Threshold.

As described in GB/T 4854.7-2008, each person's hearing threshold is different, and these standard documents only give the average hearing threshold.

However, other indicators of the distribution of individual hearing thresholds are useful for assessing the relationship between individual hearing ability and the group average hearing threshold.

These indicators have also been used in noise-related assessments, such as the sensitivity of normal hearing adolescents to noisy environments (such as machine noise).

Estimated percentage of people aged 18-24 years.

This document provides a method for calculating percentiles of the hearing threshold distribution for the frequency range 20 Hz to 16000 Hz.

The average value of the hearing threshold distribution is GB/T 4963-2007 and the hearing threshold levels specified in GB/T 4854.7-2008. In addition, the method also uses many of the hearing thresholds based on these documents.

data.

NOTE: Percentiles of hearing thresholds can also be calculated using broadband noise as the test sound. However, due to insufficient data on broadband noise, this document specifies only pure tone hearing thresholds.

However, it is possible that this document is also applicable to 1/3 octave bandwidth noise.

Otology for children aged 18 to 25 years old under acoustic free field conditions Statistical distribution of normal hearing thresholds

1 Scope

This document provides descriptive statistics and percentiles of the hearing threshold distribution, the average value of which is GB/T 4963-2007 and Reference hearing thresholds specified in GB/T 4854.7-2008. The mean and percentile hearing thresholds are specified by the following conditions.

- a) In the absence of a subject, the sound field is a free plane traveling wave field (free field);
- b) The sound source is facing the subject (forward incidence);
- c) The acoustic signal is a pure tone (sinusoidal signal);
- d) The sound pressure level is measured at the center of the subject's head in the absence of the subject;
- e) binaural audiometry;
- f) The subjects were 18 to 25 years old with normal otological status.

Note 1: The xth percentile hearing threshold means that x% of the individuals in the population have hearing thresholds lower than this value.

The results of the analysis are shown in Appendix D.

NOTE 2 The applicability of the percentiles and reference values given in this document to diffuse field listening conditions has not been verified. They apply to frequencies between 20 Hz and 250 Hz.

As shown in Table 1 of GB/T 4854.7-2008, the difference in hearing thresholds between

free-field and diffuse-field audiometry conditions is zero within this range.

According to ISO 266, the reference frequencies in the range of 20 Hz to 16000 Hz and some intermediate frequencies are given in numerical form.

Percentile of the audiometric frequency.

Percentiles are suitable for evaluating the distribution of individual hearing thresholds under the above conditions, and are also used to evaluate the individual's hearing threshold at low levels close to the hearing threshold.

Hearing sensitivity in high noise.

NOTE 3 Applicable examples of hearing threshold distributions for noise assessment are given in Annex D of ISO 7779:2010.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 4963-2007 Acoustics standard equal loudness level curves (ISO 226:2003, IDT)
GB/T 4854.7-2008 Reference zero level for acoustic calibration of audiometric equipment Part 7: Reference level for free-field and diffuse-field audiometry Hearing threshold (ISO 389-7:2005, IDT)

3 Terms and Definitions

There are no terms or definitions that require definition in this document.

4.1 General

The hearing threshold distribution for frequencies f below 10000 Hz should be approximated by a Gaussian distribution, which is defined by the mean T_f and the standard deviation σ_{mf} .