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

GB/T 14366-2017

Replacing GB/T 14366-1993

Acoustics -- Estimation of noise-induced hearing loss

声学 噪声性听力损失的评估

(English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 14366-1993 "acoustic occupational noise measurement and noise-induced hearing impairment assessment", and GB/T 14366-1993 compared to the main technical changes are as follows.

--- Added the fourth chapter principle. The database recommended in this chapter not only extends the age of the population to 70 years of age, but also data According to the latest research results have been modified (see Chapter 4).

This standard uses the translation method identical with ISO .1999.2013 "Acoustic noise hearing loss assessment." the documents of our country that are consistent with the corresponding international documents that are normative references in this standard are as follows.

--- GB/T 7582-2004 Acoustic threshold and the statistical distribution of age (ISO 7029:2000, IDT)

--- GB/T 21230-2014 Acoustic occupational noise exposure measurement engineering method (ISO 9612:2009, IDT) this standard proposed by the Chinese Academy of Sciences.

This standard by the National Acoustic Standardization Technical Committee (SAC/TC17) centralized.

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Introduction

This standard by statistical methods, proposed at different ages of people "noise-based permanent threshold shift" (NIPTS) and noise exposure, provide Assessment No other reason Noise-only exposure (or age-dependent effects) People with hearing impairment, or hearing has been measured or estimated non-Methodological steps to screen for hearing loss in the population. NIPTS in this standard is considered as an additive noise independent of other factors affecting the hearing threshold item. For a given noise exposure condition, NIPTS takes a positive number over a range of population percentages and exposure durations, corresponding to people the range of variation of individual susceptibility to noise.

Persons exposed to noise on a regular basis may have hearing loss of varying severity. As a result, their understanding of the language, the sound of everyday the perception of the signal, or the appreciation of music, will be affected. Unless exposed to explosions, high impulse noise and particularly strong steady-state noise, in general Permanent damage to the hearing organ takes time, requiring months, years, or even decades of exposure. Before producing NIPTS, there are often A period of hearing recovery is called a "transient threshold shift" (TTS). TTS severity and its recovery, with exposure to sound levels and exposure Time related. For an individual, it is impossible to determine exactly how much the change in the threshold level is caused by noise and how much is caused by other factors of. However, for individuals with questions, this standard provides an auxiliary audiological diagnosis that can be used to estimate the most likely cause. but for populations exposed to a significant amount of noise, the change in the statistical distribution of hearing thresholds can be determined. Some parameters, such as average NIPTS and its median can be used to describe the difference between the two groups hearing threshold level, the two groups of people except a group of specific (often occupational) noise storm Exposed, all other aspects are similar. This standard uses NIPTS to represent the noise level in the statistical distribution of the hearing threshold of the population Permanent threshold shift, it can not be used for individuals.

This standard can be used to calculate the long-term risk of hearing loss due to regular exposure to occupational noise or daily repetitive noise exposure.

In some countries, hearing loss due to exposure to occupational noise can have legal consequences such as liability and compensation. Set a risk for different frequencies Boundaries, above which boundaries may cause hearing impairment. Listening threshold corresponding to the boundary line itself is not only related to hearing loss, but also often associated with listening the legal definition of force disorder is related to interpretation, which needs to be determined in the light of social and economic conditions. In addition, the definition of hearing impairment and hope the quality of speech recognition, the average background noise level, and even the language in terms of the relative importance of

various frequencies. and so, this standard does not specify (unlike the second edition of ISO .1999) specific methods and formulas for measuring noise exposure for various time characteristics, and only Standardizes a uniform method for estimating hearing loss that can be used to assess hearing impairment in accordance with the formula chosen or prescribed by the respective country hinder. The results obtained by this standard can also be used to estimate the long-term effects of noise on everyday acoustic perception and music appreciation, or on a particular of the frequency that is not necessarily dictated by the hearing impaired formula.

Noise-induced hearing loss is not only a result of occupational noise exposure but also a total noise exposure. The individual's (work, home, During entertainment) It is important that non-occupational noise exposure be taken into account. Only in this non-occupational noise exposure is associated with occupational noise bursts Exposure is negligible, this standard should only be used for occupational noise exposure caused by the estimated hearing loss risk. In addition, this standard should also be used Calculate the expected total daily noise exposure for combined (occupational plus non-occupational) noise exposure. If necessary, it can be estimated Contribution of occupational noise exposure to total hearing loss.

Maximum tolerable or maximum allowed noise exposure, protection requirements, and selection of specific formulas for assessing the risk of hearing impairment or compensation Choice, requires consideration of ethical, social, economic and political factors other than this standard. Different countries have different interpretations of these factors Therefore, the consideration of these factors is not the content of this standard.

This standard recommends the use of ISO 9612 measurement of exposure sound level, the use of ISO 7029 listening threshold level and the age of the statistical distribution Calculate and set up database A. In assessing noise-induced hearing loss and hearing impairment, reference may be made to GBZ 49-2014 "Occupational noise-deaf Diagnostic criteria".

Assessment of acoustic noise hearing loss

1 Scope

This standard specifies the level of exposure to noise at different levels and duration, the threshold level of adult hearing expected permanent noise threshold (NIPTS) calculation method; proposed threshold level exceeds the specified value, the common audiometry frequency or some of the frequency combinations, with a variety of the formula calculates the basic principle of hearing impairment.

Note 1: This standard does not provide the audiometric frequency, combination or weighted combination required to assess hearing impairment; nor does it provide a risk boundary beyond this boundary the line will produce different degrees of hearing impairment. The choice of these parameter values is done by the user. The various sound pressure levels in this standard did not

take into account the effect of a hearing aid, while a hearing aid, reduces the effective exposure level at the ear and modifies the noise spectrum.

A measure of the noise exposure of the population at risk, normalized exposure level for a nominal 8h working day for a given exposure period, LEX, 8h.

This standard applies to frequencies below about 10kHz noise, and the time characteristics of noise, including steady-state, intermittent, undulating and not Regular Proved to prove the use of extrapolation, this standard can be used for sound pressure over.200Pa (140dB, the benchmark value of 20μPa) situation.

The formula proposed in this standard can be used to calculate the audible frequency range, due to noise exposure caused by hearing loss, exposure level and exposure Duration (years), including statistical distribution. The formula does not differentiate between men and women.

Note 2: Although the hearing loss model hypothesis is based primarily on data on the exposure of occupant groups to occupational noise, it can be used to assess comparability Impact of amateur noise and combined noise exposure.

Note 3: The prediction method proposed in this standard is based on data collected from basically broadband, steady-state, pure tone-free noise.

In order to calculate the change in hearing threshold caused by noise exposure and the risk of hearing loss, a control population should be used. This standard is strict the definition of a normal screening population for otology (see ISO 7029), and an example of a non-screened population of three typical industrialized societies. This standard Users can follow their special requirements, select the control group of people.

Note 4: All data and calculations in this standard are based on data collected from experiments conducted on daily noise exposure of up to 12 hours and carefully , And simplifying the approximation will limit its effectiveness to the stated parameters, percentages and exposure sound level ranges, as well as the frequency range used.

This standard is based on statistical data and therefore can not be used to predict or assess individual hearing loss unless statistically Rate description.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

ISO 7029 Acoustic threshold and the statistical distribution of age
(Acoustics-Statisticaldistributionofhearing thresholdsasafunctionofage) ISO 9612
Guidelines for the Measurement and Evaluation of Noise Exposure in Acoustic Work
Environment Engineering Methods (Acoustics-Determinationof