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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 6881-2023

Replacing GB/T 6881.1-2002

Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for reverberation test rooms

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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 replaces GB/T 6881.1-2002 "Acoustic Sound Pressure Method for Determining the Sound Power Level of Noise Sources Reverberation Chamber Precision Method" and is consistent with

Compared with GB/T 6881.1-2002, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

---Added 3.4, 3.14, 3.17, and 3.18 in terms and definitions (see Chapter 3), and deleted "mean square sound pressure" (see the.2002 edition of

3.4);

---Added sound energy level measurement part (see Chapter 9 and Appendix F);

---Added more detailed content on measurement uncertainty (see Chapter 10).

This document is equivalent to ISO 3741.2010 "Acoustic Sound Pressure Method for Determination of Sound Power Level and Sound Energy Level of Noise Sources Reverberation Chamber Accuracy"

Secret Dharma".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

This document is one of the standards corresponding to the ISO 3740[3]~ISO 3747[9]

series of international standards. This series of standards specifies the determination of

Various methods of sound power levels and sound energy levels of machines, equipment and their components. Which method to choose from among a series of standards corresponding to different applications

The method depends on the purpose of measuring the sound power level and the facilities available. ISO 3740 [3] provides general guidance for the selection of methods.

The ISO 3740[3]~ISO 3747[9] series of standards only give general principles for the operating and installation conditions of machine equipment during measurement. It is necessary for each

Establish test specifications for each type of sound source to give detailed requirements for installation, load and operating conditions, and obtain the sound power level under these conditions.

or sound energy level.

The method given in this document requires that the sound source under test be installed in a reverberant chamber with specific acoustic characteristics. Therefore, the premise of this method is that the measured

The sound power or sound energy of a sound source is directly proportional to the mean square sound pressure averaged in time and space, and only depends on the acoustic and geometric characteristics of the room and the space.

Physical constants of gas.

For sound sources emitting narrowband frequency or discrete frequency sound, precise measurement of the radiated sound power level or sound energy level in the reverberation room requires

Does more work than a sound source that emits sound evenly over a wide frequency range. The reasons are.

a) The spatio-temporal average sound pressure measured by moving a microphone along a short distance or measured by an array composed of a small number of microphones is not always the average sound pressure of the entire room.

A good estimate of the temporal and spatial average sound pressure;

b) The normal form of the room and the position of the sound source within the room have a strong influence on the sound power or sound energy radiated by the sound source.

For sound sources that emit narrowband sound or discrete modulated sounds, the increased measurement workload includes optimization and performance qualification of the reverberation chamber or the use of more

The position of the sound source and the position of the microphone (or increase the length of the moving distance of the microphone). Add low-frequency sound absorbers or install rotating diffusers in the reverberation room

body helps reduce measurement workload.

The method specified in this document allows the determination of sound power levels and sound energy levels in the 1/3 octave band and from them the calculation of octave band, A-weighted

and unweighted total sound power level and sound energy level.

The method described in this document meets the level 1 accuracy (precision level) defined in GB/T 19052, and the final sound power level and sound energy level package

Corrections are included for possible differences between the meteorological conditions during the test period and the baseline meteorological conditions. For acceptable reverberation loops at lower accuracy

For applications in the environment, please refer to ISO 3743-1[4], ISO 3743-2[5], and ISO 3747[9].

Acoustic sound pressure method determines the sound power level and sum of noise sources

Sound energy level reverberation chamber precision method

1.1 Overview

This document describes a method for determining the sound power level and sound energy level of a noise source by measuring the sound pressure level in a reverberation chamber.

The 1/3 octave band sound power level generated by the noise source (or the sound energy level in the case of burst sound or transient noise) is calculated using the measured sound pressure level

Obtained, including corrections for differences between the meteorological conditions during the test at the test site and those corresponding to the reference characteristic impedance. This article

The software provides the measurement and calculation process for determining sound power level and sound energy level by direct method and comparative method.

Usually, the measurement frequency range includes the 1/3 octave band with a center frequency of 100Hz~10000Hz. Appendix E gives the prescribed method

Application Guidelines for Extension to Lower Frequency Ranges. This document cannot be used for the 1/3 octave band frequency range above 10000 Hz.

Note. For higher frequencies, the method specified in ISO 9295 can be used.

1.2 Types of noise and noise sources

This document applies to various types of noise (steady state, unsteady state, fluctuations, bursts, etc.) defined in GB/T 19052.

The sound source under test can be a device, machine, component or accessory. This document is applicable to the measured sound source whose volume is not larger than 2% of the reverberation chamber volume.

For sound sources whose volume is greater than 2% of the reverberation chamber volume, the measurement results may not reach the level 1 accuracy specified in GB/T 19052-2003.

(Precision level) requirements.

Note. Under special circumstances, the sound source volume can be increased to a maximum of 5% of the reverberation chamber volume. For this situation, the relevant noise test specifications give possible test

Quantitative uncertainty results.

1.3 Reverberation room

The test chamber used for measurements in accordance with this document is a reverberant chamber that meets the specified requirements (see Chapter 5).

1.4 Measurement uncertainty

Uncertainty information on A-weighted sound power levels and sound energy levels measured in accordance with this document is given for the specified frequency bands and covering all frequency bands.

The uncertainty complies with the level 1 accuracy (precision level) of GB/T 19052-2003.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

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

this document.

GB/T 3241-2010 Electroacoustic octave and fractional octave filters (IEC 61260.1995, MOD)