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

GB 4129-1984

Replacing GB/T 4129-2003

**Acoustics - Requirements for the performance and calibration
of reference sound sources used for the determination of
sound power levels
(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 replaces GB/T 4129-2003 "Performance and calibration requirements for standard sound sources used in the determination of sound power levels in acoustics".

Compared with GB/T 4129-2003, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Added meteorological condition correction (see Chapter 4, 8.4 and Appendix A);
- Changed the requirements for measurement uncertainty (see Chapter 11, Chapter 4 of the 2003 edition);
- Added alternative method for low frequency calibration (see Appendix B).

This document is equivalent to ISO 6926:2016 "Acoustics - Performance and calibration requirements for standard sound sources for the determination of sound power levels".

The following minimal editorial changes have been made to this document.

--- Incorporate the contents of the ISO 6926:2016/Amd1.2020 amendment, and use a vertical double line (||) on the outside of the corresponding changed clauses Marking;

--- Change the explanatory content in the definitions of "sound power level" and "directivity index" to "note" (see 3.7, 3.9).

Introduction

Standard sound sources are widely used in the "comparison method" to determine the noise emission of fixed sound sources.

The numerical relationship between the sound power level of a noise source at a given location in an acoustic environment and the spatially and temporally averaged sound pressure level at a series of microphone locations is given.

Once the relationship is established, the sound power level generated by the "unknown sound source" can be determined by directly measuring the average sound pressure level of the sound source.

This document is a supplement to GB/T 14367 and other acoustic test method standards, which provide methods for determining the sound power level of machines and equipment.

Various methods specify acoustic requirements applicable to measurements in different test environments.

Among the acoustic test method standards, there are 6 standards involving test methods that require the use of standard sound sources. These 6 standards are GB/T 6881, GB/T 6881.2, GB/T 46044, GB/T 3767, GB/T 3768, GB/T 16538.

It is worth noting that the sound power output of the standard sound source, especially the low-frequency sound power output, will change with the distance from the sound source to the nearby reflecting surface.

Therefore, the sound power value of the standard sound source is only valid for the position used during calibration.

In addition to being used for comparative determination of sound power levels, standard sound sources can also be used for identification tests of acoustic environments and for estimating the impact of acoustic environments on the sound power levels of equipment located in the effect of the sound pressure levels produced by one or more sound sources in the environment. For standard sound sources and examples of their application, see GB/T 17249.3 and GB/T 27763. These examples also have some requirements that are

different from this document.

Acoustics Standard sound source for determination of sound power level Performance and calibration requirements

1 Scope

This document specifies the acoustic performance requirements for standard sound sources, including.

---Time stability of sound power output;

---Spectral characteristics;

---Directionality.

The temporal stability is defined by the repeatability standard deviation (see 5.2). The spectral characteristics can be measured in a semi-anechoic room or a reverberation room according to the specifications of this document.

The performance requirements for the directivity index can only be verified in a semi-anechoic room (see 5.5).

This document also specifies the octave band and 1/3 octave band sound power levels and the A meter under the standard meteorological conditions specified in Chapter 4.

A method for providing calibration data and uncertainties of sound power levels for sound sources intended to be used as standard sound sources when using sound power levels that are not properly weighted.

Although this method is typically performed in a testing laboratory, this document refers to calibration standards.

The pressure level measurement and distance are traceable, but in the strict metrological sense, the sound power level calibration results cannot be directly traced back to the national meter.

Testing laboratories using this method are not required to meet all the requirements normally associated with calibration laboratories.

NOTE: ISO/IEC 17025 gives different requirements for the qualification of testing laboratories and calibration laboratories. Laboratories that test standard sound sources in accordance with this document Usually meets the requirements of testing laboratories, but not necessarily those of calibration laboratories.

This document specifies not only the calibration method of a standard sound source in a free field above a reflecting surface, but also the calibration method of a standard sound source at different distances from the interface in a reverberation room.

Calibration method of distance standard sound source. For the standard sound source position on a reflecting surface, the above two different test environments are at 200 Hz and the above frequency bands are considered equivalent; for the frequency bands up to 160 Hz, systematic deviations may occur (see 11.2); for the frequency bands above 100 Hz, for the lower frequency band, an alternative calibration method using sound intensity is given.

The sound source can be placed directly on the ground or mounted on a bracket at a certain height above the ground.

Calibrate in a reverberation chamber. A ground-mounted sound source can be calibrated in a semi-anechoic chamber or a reverberation chamber.

This document is only applicable to sound sources with a maximum height dimension less than 0.5 m and a maximum horizontal dimension less than 0.8 m.

When measuring on the measurement surface, only standard sound sources placed on the ground can be used.

There is no maximum size restriction for sources.

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 3767-2016 Acoustics - Determination of sound power level and sound energy level of noise source by sound pressure method - Approximate free field above reflecting surface Process method (ISO 3744:2010, IDT) GB/T 3785.3-2018 Electroacoustics Sound Level Meters Part 3: Periodic Tests (IEC 61672-3:2013, IDT) GB/T 6881-2023

Acoustics-Determination of sound power level and sound energy level of noise sources by sound pressure method-Reverberation chamber precision method (ISO 3741.

2010, IDT)

GB/T 6882-2016 Acoustics - Determination of sound power level and sound energy level of noise sources by sound pressure method - Anechoic chamber and semi-anechoic chamber precision method (ISO 3745:2012, IDT)