

ICS 17.040



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

**GB/T 6882-2016**

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**Acoustics -- Determination of sound power levels and sound energy  
levels of noise sources using sound pressure -- Precision methods for  
anechoic rooms and hemi-anechoic rooms**

**(English Translation)**

**Issued on: February 24, 2016**

**Implemented on: September 1, 2016**

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**Issued by: General Administration of Quality Supervision, Inspection and**

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### Foreword

This Standard is one of the series of standards of determination of sound power levels and sound energy levels of noise sources using sound pressure.

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

This Standard replaces GB/T 6882-2008 "Acoustics - Determination of sound power levels of noise sources using pressure - Precision methods for anechoic and hemi-anechoic rooms".

Compared with GB/T 6882-2008, the main modifications in this Standard are as follows.

- added the content of terms and definitions;
- the content of measurement uncertainty has been greatly revised; added the content of cyclic comparison test and mathematical model method to determine the standard deviation of reproducibility;
- improved the "background noise requirement" to the "background noise criterion"; respectively formulated the relative value criterion and the absolute value criterion;

supplemented the remarks of 5.2.2 absolute value criterion, so as to make the remarks more detailed and clearer;

- modified the definition and expression of directivity index;
- added the baseline weather conditions;
- increased microphone array positions from 20 to 40;
- kept the Annex K (informative) "Guidelines for design of test room" in GB/T 6882-2008 as Annex NA of this Standard; this annex was deleted from ISO 3745:2003 when ISO 3745:2012 was revised; taking into account the needs of China's acoustic measurement and precision testing room construction, this Standard retains this annex.

This Standard uses translation method to identically adopt ISO 3745:2012 "Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for anechoic rooms and hemi-anechoic rooms" (English version).

The Chinese documents which have consistency with the international normative reference in this Standard are as follows.

- GB/T 3241-2010, "Electroacoustics - Octave-band and fractional-octave-band filters" (IEC 61260:1995+AM1:2001, MOD) - GB/T 6379 "Accuracy (trueness and precision) of measurement methods and results" (all parts), [ISO 5725 (all parts)] - GB/T 17247.1-2000, "Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere" (eqv ISO 9613-1:1993) - GB/T 17312-1998, "Random-incidence and diffuse-field calibration of sound level meters" (eqv IEC 61183:1994) this Standard was proposed by Chinese Academy of Sciences.

This Standard shall be under the jurisdiction of National Technical Committee on Acoustics of Standardization Administration of China (SAC/TC 17).

## 1 Scope

The test rooms that are applicable for measurements made in accordance with this Standard are an anechoic room or hemi-anechoic room, also called, respectively, a free-field test room or hemi-free-field test room.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

sound field in a homogeneous, isotropic medium free of boundaries

### 4 Reference meteorological conditions

Reference meteorological conditions for the purpose of calculating the sound power level and sound energy level, corresponding to a reference characteristic acoustic impedance of air  $\rho c = 411.5 \text{ N-s/m}^3$  (where  $\rho$  is the density of air and

### 5 Test rooms

If the above background noise criteria are not satisfied, the report shall clearly state that the background noise requirements of this Standard have not been met, and, in the case of frequency band measurements, shall identify the particular frequency bands that do not meet the criteria. Furthermore, the report shall not state or imply that the measurements have been made "in full conformity" with GB/T 6882.

### 6 Instrumentation

The maximum permissible error for instruments used for meteorological measurements shall be for instruments used for monitoring meteorological conditions, e.g. to ensure that any of these parameters is within a specified interval, manufacturer's specifications are deemed sufficient to verify these requirements.

### 7 Definition, location, installation and operation of noise source under test

Care shall be taken to ensure that any electrical conduits, piping or air ducts connected to the noise source under test do not radiate significant amounts of sound energy into the test environment.

### 8 Measurement surface

The measurement surface shall be wholly contained within the region of the hemi-anechoic room which is qualified for measurements in accordance with Annex A or Annex B.

### 9 Determination of sound power levels and sound energy levels

The meteorological conditions (air temperature, static pressure and relative humidity) around the noise source at the time of the test shall be measured.

The background noise correction,  $K_{1i}$ , at the  $i$ th microphone position or for the  $i$ th microphone traverse in each one-third-octave band shall be calculated using Equation (11), in decibels (dB).