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

GB/T 17697-2014

Replacing GB/T 17697-1999

**Acoustics -- Determination of sound power radiated into a duct
by fans -- In-duct method**

声学 风机和其它通风设备辐射入管道的声功率测定 管道法

(English Translation)

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Foreword

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

This standard replaces GB/T 17697-1999 "Acoustics fan sound power radiated into a duct pipe measuring method." this standard compared with GB/T 17697-1999, the main

technical changes are as follows.

- Expanding the scope of application, including the connecting pipes of the air handler, the connection pipe cleaners, air conditioners and even connecting pipes Then hot air duct;
- Extend the frequency range of uncertainty;
- Extend the sampling tube allows maximum mean flow velocity, increasing the flow rate of the sampling tube - modal comprehensive correction value;
- Increase the technical content of the nose cone and foam balls wind shield;
- End of the pipe to increase the maximum permissible sound pressure reflection coefficient;
- Technical terms and in accordance with GB/T 3947-1996 "Acoustic Terminology" is defined.

This standard uses the translation method identical with ISO 5136:2003 "Acoustics fans and other ventilation devices radiated into a duct sound power Determination duct method." Correspondence between the consistency of the standards of international documents and normative references of the following documents.

- GB/T 3240-1982 acoustical measurement commonly used frequency (neqISO 266. 1975);
- GB/T 3241-2010 electro-acoustics octave and fractional octave filters (IEC 61260:1995, MOD).

This standard was proposed by the Chinese Academy of Sciences.

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

Introduction

Appendix A lists the various parameters to determine flow rate and modal comprehensive correction value. Appendix B provides for two measuring sound with turbulence SNR

Methods. Appendix C shows the ways that one-third octave band sound level to calculate the A-weighted sound power level. Appendix D gives a level and average velocity calculation example modal comprehensive correction value.

Fans and other sound power radiated into a duct ventilation equipment depends in part on the type of pipe acoustic impedance characterization. because this, for a measure to be made clear that the test pipe. The standard test pipe has a circular cross section and muffler end.

Appendix E gives details of typical muffler tip. Since the end of the impedance muffler

constructed reality is found in high impedance and low impedance

Between the intermediate value, so these special conditions resulting sound power is the practical application of the representative value. Theoretically, according to the ventilation equipment Impedance data and estimate the actual pipeline application radiated sound power. Because this information is currently not complete, so the calculation of them in acoustics Usually do not consider the impact of impedance.

In order to suppress the turbulent pressure pulsation at the microphone, preferably with a long cylindrical hood (sampling tube). The sampling tube with a microphone Mounted in radial position, so that, even in the plane wave can be calculated based on the high order acoustic modes test sound frequency range determined by the formula Relationship pressure level and sound power level.

If in many different laboratories repeated measurements, the measurement uncertainty according to the expected standard deviation is given (see Chapter 4).

This standard does not detail the provisions measuring conditions (performance measurement) method can refer to the provisions of GB/T 1236 Industrial and conditions.

This standard is one of the ventilation fans and other equipment series of sound power level measurement method.

Usually in the absence of connecting pipes, since the fan inlet and exit plane capable of reflecting sound, fan inlet and outlet into the free-field radiation and radiation into the Sound power conduit is different. This standard specifies the law applicable to the fan duct inlet and outlet sound power radiated into a duct measurement. Fan Jin, Export radiated into free-field sound power should reverberation chamber method (GB/T 6881 series), the free field method (GB/T 3767, GB/T 6882, GB/T 3768) or acoustic intensity method (GB/T 16404 series) was measured.

Fans and other ventilation equipment acoustic radiation into Determination of sound power conduit pipe method

1.1 Overview

This standard specifies a measurement of the connection pipe ventilation fans and other equipment into the outlet end of the pipe has radiated into the end of the muffler Sound power approach.

Note: For simplicity. Hereinafter called "fan" means "fans and other ventilation equipment." this method is applicable to an air temperature of -50 °C ~ 70 °C and steady radiation wide, narrow and discrete frequency noise of the fan. Test Tube Channel diameter of 0.15m ~ 2m. Appendix H and Appendix I describe the diameter d 2m closed beta testing of the pipeline Set the fan sound power approach.

Determination of the standard microphone head position of the maximum average stream

velocity limit depends on the type of microphone shield.

- Foam balls hood. 15m/s;
- Nose cone. 20m/s;
- Sampling tube. 40m/s.

If these values are exceeded, by the above-mentioned microphone guards were insufficient to contain turbulent pressure pulsations (see 3.9).

Sound power testing method to measure flow parameters according to GB/T 1236 regulations. Therefore, the test pipe usually fan outlet end Equipped with a "star" rectification gate of the eddy current minimum (see 5.2.9 and 7.3). According to GB/T 1236C type large fan installed, eliminating the need rectification the gate, but only vortex angle not exceeding 15 ° conditions (Appendix J illustrates the determination of the vortex angle).

Note: GB/T 1236 provisions of the wind turbine installation types are. only the outlet end of the pipe is connected to (B type), only the inlet end of the pipe is connected (C type) and both ends of the pipe Connected (D type).

1.2 Application of the sound source type

This standard describes test methods are applicable to a combination of the fan with at least one end of the pipe is connected to the sound source, as well as other fan/muffler or Called "black box" of the fan assembly.

Fans and other equipment covered by this standard include.

- Centrifugal fan connection pipe;
- Connecting duct axial fan;
- Connecting pipe Francis fan;
- Connecting duct air handlers;
- Suction device connection pipe;
- Air conditioner connected to the pipeline;
- Connecting piping hot air.

This standard also applies to auxiliary fan steady stream transmission, and testing the sound pressure inside the pipe and the turbulent pressure fluctuation signal to noise ratio of not less than 6dB (see 7.2.1) of other pneumatic sound sources, such as the plenum, dampers and throttle device.

GB/T 25516 specifies the determination of such aerodynamic sound source stream another method of reproducing sound power level (reverberation chamber method), it does not