

ANSI/AMCA Standard 320-08

Laboratory Methods of Sound Testing of Fans Using Sound Intensity

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**AIR MOVEMENT AND CONTROL
ASSOCIATION INTERNATIONAL, INC.**

The International Authority on Air System Components

ANSI/AMCA STANDARD 320-08

Laboratory Method of Sound Testing of Fans Using Sound Intensity



**Air Movement and Control Association International, Inc.
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Arlington Heights, IL 60004-1893**

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Foreword

This standard was developed in response to the need for an accurate and reliable method of determining the sound power level of fan equipment without special acoustical facilities such as anechoic, hemi-anechoic, or reverberant rooms. It allows for smaller and larger fans to be tested than was possible previously in the AMCA laboratory using ANSI/AMCA 300 Reverberant Room Method for Sound Testing of Fans. This standard combines the established fan installation and operation procedures of ANSI/AMCA 300 with the method of sound power determination using sound intensity measurements in ANSI S12.12 American National Standard Engineering Method for the Determination of Sound Power Levels of Noise Sources Using Sound Intensity.

Since sound power levels are considered to be independent of the acoustical environment around the fan, a good comparison may be made between two or more fans proposed for any specific air performance condition. Moreover, these values establish an accurate base for estimating the acoustical outcome of the fan installation in terms of sound pressure levels. A successful estimate of sound pressure levels requires extensive information on the fan and the environment in which it is to be located.

It is often advantageous for the equipment user to employ acoustical consultation to ensure that all factors which affect the final sound pressure levels are considered. More detailed information on the complexity of this situation may be found in other documents available elsewhere.

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Laboratory Method of Sound Testing of Fans Using Sound Intensity

1. Scope

This standard is intended to apply to fans of all types and sizes. This standard is limited to the determination of airborne sound emission for the specified setups. Vibration is not measured, and the sensitivity of airborne sound emission to vibration effects is not determined.

The size of a fan which can be tested in accordance with this standard is limited only by the practical aspects of the test setup.

This standard establishes a method of determining the octave band sound power levels of a fan. The method is reproducible when all requirements of the method are met.

In this standard, sound power levels are determined using sound intensity measurements on a measurement surface that encloses the sound source. Guidelines are provided on suitable test environment acoustical characteristics, the measurement surface, and the number of intensity measurements. Test setups are designated generally to represent the physical orientation of fans as installed following ANSI/AMCA 210, and used also in ANSI/AMCA 300.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI/AMCA 210-99/ ANSI/ASHRAE 51-99 *American National Standard Laboratory Method of Testing Fans for Aerodynamic Performance Rating*, Air Movement and Control Association International, Inc., 30 W. University Drive, Arlington Heights, IL, 60004-1893 U.S.A.

ANSI/AMCA 300-05 *American National Standard Reverberant Room Method for Sound Testing of Fans*, Air Movement and Control Association International, Inc., 30 W. University Drive, Arlington Heights, IL 60004-1893 U.S.A.

ANSI S1.6-1984 (R1990) *American National Standard Preferred Frequencies, Frequency Levels, and Band Numbers for Acoustical Measurements*, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, 10005-3993 U.S.A.
(AMCA 1108-84-A0)

ANSI S1.11-1986, *American National Standard Specification for Octave-Band and Fractional-Octave Band Analog and Digital Filters*, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, 10005-3993 U.S.A. (AMCA 1727-86-A0)

ANSI S1.13-1995, *Measurement of Sound Pressure Levels in Air*, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, 10005-3993 U.S.A.

ANSI S12.5-1990 *American National Standard Requirements for the Performance and Calibration of Reference Sound Sources*, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, 10005-3993 U.S.A. (AMCA 1863-90-A0)

ANSI S12.12-1992 *American National Standard Engineering Method for the Determination of Sound Power Levels of Noise Sources Using Sound Intensity*, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, 10005-3993 U.S.A. (AMCA 1850-92-A0)

ANSI S1.40-1984 (R1990), *American National Standard Specification for Acoustical Calibrators*, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, 10005-3993 U.S.A. (AMCA 1895-84-A0)

ANSI/IEEE SI 10-1997 *Standard for Use of the International System of Units (SI): The Modern Metric System*, Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, N.J., 08854-4141 USA