

ANSI/ASA S12.11-2003/Part 1  
ISO 10302:1996 (MOD)

Reaffirmed by ANSI  
on July 15, 2008

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## AMERICAN NATIONAL STANDARD

# Acoustics – Measurement of noise and vibration of small air-moving devices, Part 1: Airborne noise emission

(A Nationally Adopted International Standard)

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ANSI/ASA S12.11-2003/Part 1  
ISO 10302: 1996 (MOD)

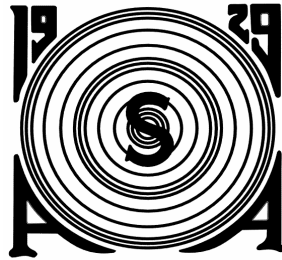
Accredited Standards Committee S12, Noise

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**ANSI S12.11- 2003/ Part 1  
ISO 10302:1996 (MOD)**

**AMERICAN NATIONAL STANDARD**

**Acoustics – Measurement of noise and vibration of  
small air-moving devices, Part 1: Airborne noise  
emission**

**Nationally Adopted International Standard**

**Secretariat**

Acoustical Society of America

Approved August 7, 2003  
American National Standards Institute, Inc.

**Abstract**

This Nationally Adopted International Standard specifies in detail a laboratory method for determining and reporting the airborne noise emissions of small air-moving devices used primarily for cooling electronic equipment, such as computer and business equipment. To provide compatibility with measurements of noise emitted by such equipment, this Nationally Adopted International Standard uses the noise emission descriptors and sound power measurement methods of ANSI S12.10-2002/ISO 7779:1999. The descriptor of overall noise emission of the air-moving device under test is the A-weighted sound power level. The one-third-octave-band sound power level is the detailed descriptor of the noise emission. Octave band sound power levels may be provided in addition to the one-third-octave-band sound power levels. ANSI S12.11-2003 Part 2 describes measurement of structure-borne noise generated by air-moving devices.

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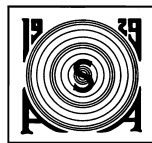
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## Foreword

[This foreword is not part of ANSI S12.11-2003 Part 1/ ISO 10302: 1996 (MOD) American National Standard Acoustics - Measurement of noise and vibration of small air-moving devices – Part 1: Airborne noise emission.]

This modified Nationally Adopted International Standard (NAIS) comprises a part of a group of definitions, standards, and specifications for use in noise. It was approved by Accredited Standards Committee S12 Noise, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S12 is as follows:

*Standards, specifications, and terminology in the field of acoustical noise pertaining to methods of measurement, evaluation, and control; including biological safety, tolerance, and comfort, and physical acoustics as related to environmental and occupational noise.*

This Standard is a modified version of International Standard ISO 10302: 1996, Acoustics - Method for the measurement of airborne noise emitted by small air-moving devices, which was prepared by Technical Committee ISO/TC 43, Acoustics, Subcommittee SC 1, Noise, and ISO/TC 117, Industrial fans.

At the time this NAIS Standard was submitted to Accredited Standards Committee S12, Noise, for final approval, the membership was as follows:

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Suggestions for improvement of this Standard will be welcomed. They should be made in writing to Accredited Standards Committee S12, Noise, in care of the Standards Secretariat, Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177.

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## Introduction

This American National Standard is a modified National adoption of ISO 10302:1996. The modifications are listed below:

- The title was changed from "Acoustics – Method for the measurement of airborne noise emitted by small air-moving devices" to "Acoustics – Measurement of noise and vibration of small air-moving devices, Part 1: Airborne noise emission"
- ANSI S2.32-1982 "Methods for the experimental determination of mechanical mobility, Part II: Measurements using single-point translation excitation" was added to the list of normative references
- Subclauses 5.1.1 Flow rate limitations and 5.1.2 Pressure limitation were added
- In Clause 5.1, "mechanical input impedance" was changed to "mobility"
- In Clause 5.1, "-50 dB" was changed to "-45 dB"
- In Clause 5.1, "ISO 7626-4" was changed to "ANSI S2.32"
- In Clause 5.1.2, "N.s/m" was changed to "m/(Ns)"
- All "International Standard" wording was changed to "Standard"

This Nationally Adopted International Standard specifies in detail a laboratory method for determining and reporting the airborne noise emissions of small air-moving devices used primarily for cooling electronic equipment, such as computer and business equipment. To provide compatibility with measurements of noise emitted by such equipment, this Nationally Adopted International Standard uses the noise emission descriptors and sound power measurement methods of ANSI S12.10-2002/ISO 7779:1999. The descriptor of overall noise emission of the air-moving device under test is the A-weighted sound power level. The one-third-octave-band sound power level is the detailed descriptor of the noise emission. Octave band sound power levels may be provided in addition to the one-third-octave-band sound power levels.

ANSI S12.11-2003/Part 2 describes measurement of structure borne noise generated by air-moving devices. ANSI S12.11-2003 Part 2 is an unmodified adoption of ECMA 275:2002.

## American National Standard

# Acoustics – Measurement of noise and vibration of small air-moving devices, Part 1: Airborne noise emission

## 1 Scope

**1.1** This Standard specifies a method for measuring the airborne noise emitted by small air-moving devices such as those used for cooling electronic, electrical and mechanical equipment. These air-moving devices include such types as propeller fans, tube-axial fans, vane-axial fans, centrifugal blowers, transverse blowers, cabinet blowers and variations of these types.

This Standard describes a method and the test apparatus for determining and reporting the airborne noise emitted by small air-moving devices as a function of the airflow and the fan static pressure developed by the air-moving device on the test apparatus. It is intended for use by air-moving device manufacturers, by manufacturers who use air-moving devices for cooling electronic equipment and similar applications, and by testing laboratories on behalf of these manufacturers. Results of measurements made in accordance with this Standard are expected to be used for engineering information and performance verification, and the method may be cited in purchase specifications and contracts between buyers and sellers. The ultimate purpose of the noise emission measurements is to provide data to assist the designers of electronic, electrical or mechanical equipment which contains one or more air-moving devices.

**1.2** This Standard is applicable to small air-moving devices used for cooling electronic equipment and for similar applications where the total sound power level of the air-moving device is of interest. Experimental data show that this method is useful up to an airflow of 1 m<sup>3</sup>/s and up to a fan static pressure of 750 Pa.

This Standard is suitable for type tests and provides a method for air-moving device manufacturers, equipment manufacturers and testing laboratories to obtain comparable results. The method defined in this Standard, by reference to ISO 7779, provides for determination of sound power levels in a qualified environment, using either a comparison method in a reverberation room based on ISO 3741 or a direct method in essentially free-field conditions over a reflecting plane based on ISO 3744 or ISO 3745. The method specified in this Standard may be applied to air-moving devices which radiate broad-band noise, narrow-band noise, or noise that contains discrete frequency components.

The method specified in this Standard permits the determination of noise emission levels for an individual unit under test. If these levels are determined for several units of the same production series, the results may be used to determine a statistical value for the production series using methods described in ISO 7574-4 or in ISO 9296.

**CAUTION**-Vibration, flow disturbances, insertion loss and other phenomena may alter radiated sound power in the actual application; therefore, the results of measurements made in accordance with this Standard may differ from the results obtained when air-moving devices are installed in equipment.

**NOTE 1** This Standard does not describe measurement of the structure-borne noise generated by air-moving devices, and it does not cover measurement of the aerodynamic performance of such devices.