

ANSI/ASA S12.11-2013/Part 1 / ISO 10302-1:2011

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## AMERICAN NATIONAL STANDARD

### **Acoustics – Measurement of airborne noise emitted and structure-borne vibration induced by small air-moving devices – Part 1: Airborne noise measurement (a nationally adopted international standard)**

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ANSI/ASA S12.11-2013/Part 1 /  
ISO 10302-1 :2011

Accredited Standards Committee S12, Noise

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Standards Secretariat  
Acoustical Society of America  
35 Pinelawn Road, Suite 114 E  
Melville, NY 11747-3177

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ANSI/ASA S12.11-2013/Part 1 / ISO 10302-1:2011  
(Revision of ANSI/ASA S12.11-2003/Part 1 / ISO 10302:1996 (MOD) (R 2008))

AMERICAN NATIONAL STANDARD

**Acoustics – Measurement of airborne noise emitted  
and structure-borne vibration induced by small air-  
moving devices – Part 1: Airborne noise measurement  
(a nationally adopted international standard)**

**Secretariat:**

**Acoustical Society of America**

**Approved on April 2, 2013 by:**

**American National Standards Institute, Inc.**

**Abstract**

ANSI/ASA S12.11-2013/Part 1 / ISO 10302-1:2011 specifies methods for measuring the airborne noise emitted by small air-moving devices (AMDs), such as those used for cooling electronic, electrical, and mechanical equipment where the sound power level of the AMD is of interest.

Examples of these AMDs include propeller fans, tube-axial fans, vane-axial fans, centrifugal fans, motorized impellers, and their variations.

This part of this American National Standard describes the test apparatus and methods for determining the airborne noise emitted by small AMDs as a function of the volume flow rate and the fan static pressure developed by the AMD on the test apparatus. It is intended for use by AMD manufacturers, by manufacturers who use AMDs for cooling electronic equipment and similar applications, and by testing laboratories. It provides a method for AMD manufacturers, equipment manufacturers and testing laboratories to obtain comparable results. Results of measurements made in accordance with this part of this American National Standard are expected to be used for engineering information and performance verification, and the methods can be cited in purchase specifications and contracts between buyers and sellers. The ultimate purpose of the measurements is to provide data to assist the designers of electronic, electrical or mechanical equipment which contains one or more AMDs.

Based on experimental data, a method is given for calculating the maximum volume flow rate of the scaled plenum up to which this part of this American National Standard is applicable.

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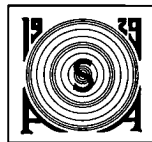
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Acoustical Society of America  
Standards Secretariat  
35 Pinelawn Road, Suite 114E  
Melville, New York 11747-3177  
Telephone: 1 (631) 390-0215  
Fax: 1 (631) 390-0217  
E-mail: [asastds@aip.org](mailto:asastds@aip.org)

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## Foreword

*[This Foreword is for information only, and is not a part of the American National Standard ANSI/ASA S12.11-2013 Part 1/ISO 10302-1:2011 American National Standard Acoustics – Measurement of airborne noise emitted and structure-borne vibration induced by small air-moving devices – Part 1: Airborne noise measurement. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.]*

This standard comprises a part of a group of definitions, standards, and specifications for use in noise. It was developed and 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 an identical national adoption of ISO 10302-1:2011. It revises and replaces ANSI/ASA S12.11-2003/Part 1 / ISO 10302:1996 (MOD) (R 2008) *American National Standard Acoustics – Measurement of noise and vibration of small air-moving devices – Part 1: Airborne noise emission*, which was a Modified Nationally Adopted International Standard. ISO 10302-1:2011 was prepared by Technical Committee ISO/TC 43 Subcommittee SC 1, Noise.

In conformance with ANSI and ISO rules, the words "this part of this American National Standard" replace the words "this part of ISO 10302" where they appear in the ISO document, decimal points were substituted in place of the decimal commas used in ISO documents, and American English spelling is used in place of British English spelling.

The ANSI/ASA equivalents for some of the ISO standards referenced in this standard are given below:

- ANSI/ASA S12.51/ISO 3741 is an identical national adoption of ISO 3741;
- ANSI/ASA S12.54/ISO 3744 is an identical national adoption of ISO 3744; and
- ANSI/ASA S12.55/ISO 3745 is an identical national adoption of ISO 3745.

At time of publication, BSR/ASA S12.11-201x/Part 2 / ISO 10302-2:2011 is expected to be approved as the identical national adoption of ISO 10302-2:2011.

ANSI/ASA S12.10-2010/Part 1 is essentially identical to ISO 7779:2010 as they are both adoptions of 10<sup>th</sup> Edition of ECMA-74 (2008).

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

W.J. Murphy, *Chair*  
S.J. Lind, *Vice-Chair*

S.B. Blaeser, *Secretary*

**3M Occupational Health & Environmental Safety Division**.....E.H. Berger

**Acoustical Society of America**.....R.D. Hellweg  
.....D. Lubman (Alt.)

**Air-Conditioning, Heating and Refrigeration Institute**.....S.J. Lind  
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<b>Air Movement &amp; Control Association, Inc</b> .....	J.A. Brooks M. Stevens (Alt.)
<b>American Academy of Audiology</b> .....	T. Ricketts C. Schweitzer (Alt.)
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<b>ExxonMobil</b> .....	B. Moulton
<b>G.R.A.S. Sound &amp; Vibration</b> .....	J. Soendergaard B. Schustrich (Alt.)
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<b>InfoComm International</b> .....	R. Derbyshire J. Bocchiaro (Alt.)
<b>Information Technology Industry Council</b> .....	W.M. Beltman J. Rosenberg (Alt.)
<b>Institute of Noise Control Engineering</b> .....	R.J. Peppin B. Tinianov (Alt.)
<b>International Safety Equipment Association</b> .....	J. Birkner C.Z. Fargo (Alt.)
<b>John Deere</b> .....	K.B. Washburn K. Cone (Alt.)

<b>National Council of Acoustical Consultants</b> .....	J. Erdreich
.....	G.E. Winzer (Alt.)
<b>National Hearing Conservation Association</b> .....	P.A. Brogan
<b>National Institute for Occupational Safety and Health</b> .....	W.J. Murphy
.....	E. Zechmann (Alt.)
<b>National Institute of Standards and Technology – National Voluntary Laboratory Accreditation Program</b> .....	B.A. Sandoval
<b>National Park Service</b> .....	M. McKenna
.....	K. Fristrup (Alt.)
<b>Noise Control Engineering, Inc.</b> .....	M.A. Bahtiarian
.....	R. Fischer (Alt.)
<b>Noise Pollution Clearinghouse</b> .....	L. Blomberg
<b>PCB Group</b> .....	K. Cox
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<b>Schomer and Associates, Inc.</b> .....	P.D. Schomer
<b>Sperian Hearing Protection, LLC</b> .....	R. Ghent
.....	B. Witt (Alt.)
<b>U.S. Air Force</b> .....	R.L. McKinley
.....	H. Gallagher (Alt.)
<b>U.S. Army Aeromedical Research Lab</b> .....	W.A. Ahroon
<b>U.S. Army Construction Engineering Research Laboratory</b> .....	M.J. White
.....	M. Swearingen (Alt.)
<b>U.S. Army Public Health Command</b> .....	C. Stewart
.....	M. Grantham (Alt.)
<b>U.S. Army Research Laboratory, Human Research and Engineering Directorate</b> .....	J. Gaston
.....	P. Fedele (Alt.)
<b>U.S. Department of Transportation</b> .....	K. Grasty
<b>U.S. Naval Surface Warfare Center - Carderock</b> .....	M. Craun
<b>Université du Québec ETS</b> .....	J. Voix
.....	F. Laville (Alt.)

Individual Experts of Accredited Standards Committee S12, Noise, were:

P.K. Baade	W.W. Lang	R.J. Peppin
E.H. Berger	D. Lubman	J. Schmitt
B.M. Brooks	D. Michaud	P.D. Schomer
A.J. Campanella	N.P. Miller	L.C. Sutherland
L.S. Finegold	W.J. Murphy	W.R. Thornton
R.D. Godfrey	M.A. Nobile	L.A. Wilber
R.D. Hellweg		G.E. Winzer

Working Group S12/WG 3, Measurement of Noise from Information Technology and Telecommunications Equipment, which assisted Accredited Standards Committee S12, Noise, in the development of this standard, had the following membership.

S. Bard, Chair

D. Ali	R.D. Hellweg	C. Saunder
B.A. Bard	K.X.C. Man	J. Schmitt
E. Baugh	A. Nava	R. Underwood
W.M. Beltman	M.A. Nobile	L. Wittig
J. DeMoss	V. Ojeda	J. Wong
E. Dunens	R.J. Peppin	Y. Xu
	D. Quinlan	

Suggestions for improvements of this standard will be welcomed. They should be sent to Accredited Standards Committee S12, Noise, in care of the Standards Secretariat of the Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177. Telephone: 631-390-0215; FAX: 631-390-0217; E-mail: [asastds@aip.org](mailto:asastds@aip.org).

## **Introduction**

This part of this American National Standard specifies in detail methods for determining and reporting the airborne noise emissions of small air-moving devices (AMDs) used primarily for cooling electronic equipment, such as that for information technology and telecommunications.

To provide compatibility with measurements of acoustical noise emitted by such equipment, this part of this American National Standard uses the noise emission descriptors and sound power measurement methods of ISO 7779. The descriptor of overall airborne noise emission of the AMD 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.

This is a preview of "ANSI/ASA S12.11-2013...". [Click here to purchase the full version from the ANSI store.](#)

## American National Standard

# Acoustics – Measurement of airborne noise emitted and structure-borne vibration induced by small air-moving devices – Part 1: Airborne noise measurement (a nationally adopted international standard)

## 1 Scope

This part of this American National Standard specifies methods for measuring the airborne noise emitted by small air-moving devices (AMDs), such as those used for cooling electronic, electrical, and mechanical equipment where the sound power level of the AMD is of interest.

Examples of these AMDs include propeller fans, tube-axial fans, vane-axial fans, centrifugal fans, motorized impellers, and their variations.

This part of this American National Standard describes the test apparatus and methods for determining the airborne noise emitted by small AMDs as a function of the volume flow rate and the fan static pressure developed by the AMD on the test apparatus. It is intended for use by AMD manufacturers, by manufacturers who use AMDs for cooling electronic equipment and similar applications, and by testing laboratories. It provides a method for AMD manufacturers, equipment manufacturers and testing laboratories to obtain comparable results. Results of measurements made in accordance with this part of this American National Standard are expected to be used for engineering information and performance verification, and the methods can be cited in purchase specifications and contracts between buyers and sellers. The ultimate purpose of the measurements is to provide data to assist the designers of electronic, electrical or mechanical equipment which contains one or more AMDs.

Based on experimental data, a method is given for calculating the maximum volume flow rate of the scaled plenum up to which this part of this American National Standard is applicable.

## 2 Normative references

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

ISO 3741, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for reverberation test rooms*

ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 3745, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for anechoic test rooms and hemi-anechoic test rooms*

ISO 5801:2007, *Industrial fans — Performance testing using standardized airways*