ASA/ANSI S12.50-2002 / ISO 3740:2000
(Formerly ANSI S12.50-2002 / ISO 3740:2000)

Reaffirmed by ANSI June 19, 2020

AMERICAN NATIONAL STANDARD

Acoustics – Determination of sound power levels of noise sources – Guidelines for the use of basic standards

(a nationally adopted international standard)

Secretariat:

Acoustical Society of America

Approved on 12 July 2002:

American National Standards Institute, Inc.

Abstract

This Nationally Adopted International Standard gives guidance for the use of a series of nine International Standards describing various methods for determining the sound power levels from all types of machinery and equipment.

It provides:

- brief summaries of these basic International Standards;

- guidance on the selection of one or more of these standards which are appropriate to any particular type (see clause 6 and annex D). The guidance given applies only to airborne sound. It is for use in the preparation of noise test codes (see ISO 12001) and also in noise testing where no specific noise test code exists.

This Nationally Adopted International Standard is not intended to replace any of the details of, or add any additional requirements to, the individual test methods in the other basic standards referred to.

ANSI/ASA S12.50-2002 / ISO 3740:2000
(Formerly ANSI S12.50-2002 / ISO 3740:2000)

Reaffirmed by ANSI September 17, 2007

Reaffirmed by ANSI September 13, 2012

Reaffirmed by ANSI October 5, 2017

Reaffirmed by ANSI June 19, 2020

AMERICAN NATIONAL STANDARD

Acoustics – Determination of sound power levels of noise sources – Guidelines for the use of basic standards

(A Nationally Adopted International Standard)

ANSI/ASA S12.50-2002 / ISO 3740:2000
(Formerly ANSI S12.50-2002 / ISO 3740:2000)

Accredited Standards Committee S12, Noise

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

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The Acoustical Society of America (ASA) is an organization of scientists and engineers formed in 1929 to increase and diffuse the knowledge of acoustics and to promote its practical applications.

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The Acoustical Society of America (ASA) provides the Secretariat for Accredited Standards Committees S1 on Acoustics, S2 on Mechanical Vibration and Shock, S3 on Bioacoustics, and S12 on Noise. These committees have wide representation from the technical community (manufacturers, consumers, trade associations, general interest, and government representatives). The standards are published by the Acoustical Society of America through the American Institute of Physics as American National Standards after approval by their respective standards committees and the American National Standards Institute.

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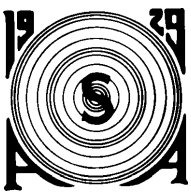

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Foreword

[This foreword is not part of the Nationally Adopted International Standard (NAIS), Acoustics - Determination of sound power levels of noise sources – Guidelines for the use of basic standards, ANSI S12.50-2002, ISO 3740: 2000.]

This Nationally Adopted International Standard (NAIS) comprises a part of a group of definitions, standards, and specifications for use in acoustical work. It has been adopted by the American National Standards Institute utilizing the Accredited Standards Committee Procedures, under the Secretariat of the Acoustical Society of America.

Accredited Standards Committee S12, Noise, under whose jurisdiction this NAIS Standard was adopted, has the following scope:

> *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 in harmony with International Standard ISO 3740: 2000, Acoustics - Determination of sound power levels of noise sources – Guidelines for the use of basic standards, which was prepared by Technical Committee ISO/TC 43, Acoustics, Subcommittee SC 1, Noise.

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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U.S. Department of Transportation	A. Konheim

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

P. K. Baade
R. W. Benson
L. L. Beranek
E. H. Berger
S. H. P. Bly
B. M. Brooks
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W. R. Thorton
H. E. von Gierke
L. A. Wilber
G. Winzer
G. S. K. Wong
R. W. Young

Working Group S12/WG23, Determination of Sound Power, which provides the parallel national work in Accredited Standards Committee S12, Noise, had the following membership:

R. J. Peppin, Co-Chair
B. M. Brooks, Co-Chair

K. Cunefare
M. Nobile
C. Ebbing
P. D. Schomer

Suggestions for improvement of this NAIS 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

0.1 General

The series of International Standards, for which this International Standard serves as a guideline for use, comprises ISO 3741, ISO 3743-1, ISO 3743-2, ISO 3744, ISO 3745, ISO 3746, ISO 3747, ISO 9614-1 and ISO 9614-2. In principle, the methods of determining sound power levels described in ISO 3741 to ISO 3747 and ISO 9614-1 and ISO 9614-2 cover all types of machinery and equipment.

ISO 3741 to ISO 3747, ISO 9614-1 and ISO 9614-2 make up a set of basic International Standards which specify the acoustical conditions and instrumentation to be used, describe the procedures to be followed, and give general information on the mounting and operation of the machine under test in order to determine sound power levels.

The selection of standards for the determination of sound power levels can, for practical reasons, have consequences for the selection of standards for the determination of the emission sound pressure levels (see ISO 11200) and vice versa. It is beneficial to make the choice of standards concurrently with respect to the two noise emission quantities.

0.2 Relationships to other standards

This International Standard is one of a series which specifies various methods for determining the noise emission of a piece of machinery or equipment, or a sub-assembly of such equipment (referred to throughout this International Standard as the "machine under test"). Standards in this series are grouped in three categories.

a) Methods for the determination of sound power levels

This category includes the following standards (see Table 1):

— ISO 3741 to ISO 3747 give methods with precision grade, engineering grade or survey grade of accuracy for determining sound power levels of machinery and equipment using sound pressure level measurements in different types of environments;

— ISO 9614-1 and ISO 9614-2 describe methods for determining the sound power levels of machinery and equipment using sound intensity level measurements.

b) Methods for the determination of emission sound pressure levels at work stations and at other specified positions

This category includes the following standards:

— ISO 11200 gives guidelines for the choice of the method to be used;

— ISO 11201, ISO 11202 and ISO 11204 give methods for determining emission sound pressure levels of machinery and equipment from measured sound pressure levels;

— ISO 11203 gives methods for determining the emission sound pressure levels of machinery and equipment from the sound power levels.

c) Noise test codes

For a particular family of machinery or equipment, a noise test code specifies the following:

— the methods and instruments to be used for the determination of the sound power level;

— the method to be used for the determination of emission sound pressure levels at work stations and/or at other specified positions;

— the positions of the work stations;

— the mounting and operating conditions of the machine under test for the purpose of determining the noise emission quantities;

— the method to be used for verifying declared noise emission quantities.

ISO 12001 gives rules for the drafting and presentation of a noise test code.

Acoustics — Determination of sound power levels of noise sources — Guidelines for the use of basic standards

1 Scope

This International Standard gives guidance for the use of a series of nine International Standards describing various methods for determining the sound power levels from all types of machinery and equipment. It provides:

— brief summaries of these basic International Standards;

— guidance on the selection of one or more of these standards which are appropriate to any particular type (see clause 5 and annex D). The guidance given applies only to airborne sound. It is for use in the preparation of noise test codes (see ISO 12001) and also in noise testing where no specific noise test code exists.

This International Standard is not intended to replace any of the details of, or add any additional requirements to, the individual test methods in the other basic standards referred to.

These basic standards specify the acoustical requirements for measurements appropriate for different test environments and accuracies.

It is important that specific test codes for various types of machinery and equipment be established and used in accordance with the requirements of these basic International Standards. Such standardized noise test codes will recommend the basic International Standard(s) to be used and will give detailed requirements on mounting and operating conditions for a particular family to which the machine under test belongs.

If no specific noise test code exists for a particular type of machinery, this International Standard is of use for the choice of the most suitable of the basic standards. In all cases, the mounting and operating conditions of the machine under test should be in accordance with the general principles given in the basic standards.

NOTE Two quantities which complement each other can be used to describe the sound emission of machinery or equipment. One is the emission sound pressure level at a specified position and the other is the sound power level. The International Standards which describe the basic methods for determining emission sound pressure levels at the work station and at other specified positions are the series ISO 11200 to ISO 11204.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3741:1999, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Precision methods for reverberation rooms*.

ISO 3743-1, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms.*