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AMERICAN NATIONAL STANDARD

Specifications and Verification Procedures for Sound Calibrators

ANSI S1.40-2006

Accredited Standards Committee S1, Acoustics

Standards Secretariat
Acoustical Society of America
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Specifications and Verification Procedures for

Sound Calibrators

Secretariat

Acoustical Society of America

Approved 20 September 2006:

American National Standards Institute, Inc.

Abstract

This Standard specifies performance requirements for coupler-type sound calibrators. It replaces ANSI S1.40-1984 American National Standard Specifications for Acoustical Calibrators, and is technically equivalent (except for the absence of requirements for radio-frequency emissions) to International Standard IEC 60942:2003, *Electroacoustics—Sound calibrators*. The standard specifies performance requirements for the sound pressure level, frequency, and total distortion generated by a sound calibrator. It also provides requirements for the influence of environmental conditions, for electromagnetic compatibility, and for instrument marking and documentation. The standard gives details of the tests necessary to verify that a model of sound calibrator conforms to all the requirements, as well as details of the method for periodic testing of a sound calibrator. The tests require the determination of the actual uncertainties of measurement which are to not exceed the maximum uncertainties allowed for laboratory measurements.

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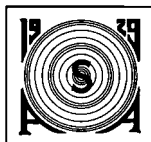
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Foreword

[This Foreword is for information only, and is not an integral part of the American National Standard ANSI S1.40—2006 American National Standard Specifications and Verification Procedures for Sound Calibrators.]

This Standard comprises a part of a group of definitions, standards, and specifications for use in acoustics. It was developed and approved by Accredited Standards Committee S1 Acoustics, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S1 is as follows:

Standards, specifications, methods of measurement and test, and terminology in the field of physical acoustics, including architectural acoustics, electroacoustics, sonics and ultrasonics, and underwater sound, but excluding those aspects which pertain to biological safety, tolerances, and comfort.

This Standard replaces ANSI S1.40-1984 (R2001), American National Standard Specifications for Acoustical Calibrators.

This Standard is technically equivalent (except for the absence of requirements regarding radio-frequency emissions from calibrators) to International Standard IEC 60942:2003, Electroacoustics – Sound calibrators.

This Standard includes two normative annexes that are considered to be integral parts of this Standard.

At the time this Standard was submitted to Accredited Standards Committee S1, Acoustics for approval, the membership was as follows:

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G.S.K. Wong, *Vice-Chair*
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Suggestions for improvements of this Standard will be welcomed. They should be sent to Accredited Standards Committee S1, Acoustics, 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

American National Standard

Specifications and Verification Procedures for Sound Calibrators

1 Scope

Sound calibrators generate known sound pressure levels at one or more frequencies in a coupler into which a specified model of microphone is inserted in a specified configuration.

NOTE An example of a specified configuration may be with or without a grid.

This Standard specifies performance requirements and verification procedures for three classes of coupler-type sound calibrators:

- Class LS: Laboratory Standard calibrator with the smallest tolerance limits.
- Class 1: Sound calibrators that are generally intended for field use with class 1 sound level meters and similar instruments.
- Class 2: Sound calibrators that are generally intended for field use with class 2 sound level meters, dosimeters, and similar instruments.

For class LS calibrators, the Standard requires the use of a laboratory standard microphone as specified in ANSI S1.15-1997/Part 1. For class 1 and class 2 calibrators, the Standard requires the use of a working standard microphone as specified in IEC 61094-4:1995.

Tolerance limits in this Standard include maximum permitted expanded uncertainties of measurement as well as the tolerance limits allowed for design and manufacturing.

This Standard applies to sound calibrators that are used to check or adjust the sensitivity of sound measuring instruments and systems including conventional, integrating-averaging and integrating sound level meters, and personal noise dosimeters.

This Standard does not include requirements for the Instruction Manual to provide data for use in adjusting a sound level indicated by a sound level meter, or equivalent instrument, in response to application of a sound calibrator to the equivalent free-field or random-incidence sound level.

Sound calibrators may provide two or more sound pressure levels and operate at two or more frequencies. These multiple-level / multiple-frequency calibrators have a single class designation for all combinations of levels and frequencies for which the Instruction Manual states conformance to the requirements of this Standard.

Additional useful functions such as tonebursts may be provided. Requirements for these additional functions are not included in this Standard.