ASA/ANSI S1.15-2021/Part 1/ IEC 61094-1:2000

AMERICAN NATIONAL STANDARD

Electroacoustics - Measurement microphones - Part 1: Specifications for laboratory standard microphones

(a nationally adopted international standard)

Secretariat:

Acoustical Society of America

Approved on June 8, 2021:

American National Standards Institute, Inc.

Abstract

This part of IEC 61094 specifies mechanical dimensions and certain electroacoustic characteristics for condenser microphones used as laboratory standards for the realization of the unit of sound pressure and for sound pressure measurements of the highest attainable accuracy. The specifications are intended to ensure that primary calibration by the reciprocity method can be readily carried out.

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Accredited Standards Committee S1, Acoustics

Standards Secretariat
Acoustical Society of America
1305 Walt Whitman Road, Suite 300
Melville, NY 11747

AMERICAN NATIONAL STANDARDS ON ACOUSTICS

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, S3/SC 1 on Animal Bioacoustics, and S12 on Noise. These committees have wide representation from the technical community (manufacturers, consumers, trade associations, organizations with a general interest, and government representatives). The standards are published by the Acoustical Society of America as American National Standards after approval by their respective Standards Committees and the American National Standards Institute (ANSI).

These standards are developed and published as a public service to provide standards useful to the public, industry, and consumers, and to Federal, State, and local governments.

Each of the Accredited Standards Committees (operating in accordance with procedures approved by ANSI) is responsible for developing, voting upon, and maintaining or revising its own Standards. The ASA Standards Secretariat administers Committee organization and activity and provides liaison between the Accredited Standards Committees and ANSI. After the Standards have been produced and adopted by the Accredited Standards Committees, and approved as American National Standards by ANSI, the ASA Standards Secretariat arranges for their publication and distribution.

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered and that a concerted effort be made towards their resolution.

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NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this Standard.

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Contents

Tables

Figures

Foreword

[This Foreword is for information only and is not a part of the American National Standard ANSI/ASA S1.15-2021/Part 1/ IEC 61094-1:2000 American National Standard Electroacoustics - Measurement microphones - Part 1: Specifications for laboratory standard microphones. 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 is a nationally adopted international standard (NAIS). 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.*

The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.

The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.

In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61094-1 has been prepared by IEC technical committee 29: Electroacoustics.

This second edition cancels and replaces the first edition and corrigendum published in 1992. This second edition constitutes a technical revision.

The text of this standard is based on the first edition, the corrigendum and the following documents:

FDIS	Report on voting
29/452/FDIS	29/461/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Note that in this national adoption, the decimal sign is a comma on the line and international English spelling is used throughout.

The committee has decided that this publication remains valid until 2005. At this date, in accordance with the committee's decision, the publication will be:

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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

Angelique Scharine, *Chair*
Richard J. Peppin, *Vice-Chair*

Nancy Blair-DeLeon, *Secretary*

Acoustical Society of America ..... Richard J. Peppin
..... Robert D. Hellweg (Alt.)

Air-Conditioning, Heating and Refrigeration Institute ..... Stephen J. Lind

ETS-Lindgren Acoustic Systems ..... Douglas Winker
..... Michael Black (Alt.)

Information Technology Industry Council ..... Willem M. Beltman
..... Stephanie Barrett

Josephson Engineering, Inc. ..... David L. Josephson

National Council of Acoustical Consultants ..... Anthony Nash

National Institute of Standards & Technology (NIST) ..... Randall P. Wagner
..... Richard Allen

OTOjOY ..... Thomas Kaufmann

PCB Group ..... Ken Cox
..... Chad M. Walber (Alt.)

Scantek, Inc. ..... Steve Marshall
..... William Gallagher (Alt.)

TSI, Incorporated.....Steve Michalski
..... Rich Bechtel (Alt.)

U.S. Air Force (USAF) .....Richard L. McKinley
..... Frank Mobley (Alt.)

U.S. Army Construction Engineering Research Laboratory .....Michelle Swearingen
.....Michael J. White (Alt.)

U.S. Naval Surface Warfare Center - Carderock.....Kuangcheng Wu
..... Jason Smoker (Alt.)

Individual Experts of Accredited Standards Committee S1, Acoustics, were:

William D. Gallagher	Richard L. McKinley	Chad M. Walber
Peter Hanes	Karl Peterman	Lixue Wu
Tomasz R. Letowski	Christopher J. Struck	

Working Group S1/WG 1, Standard Microphones and their Calibration, which assisted Accredited Standards Committee S1, Acoustics, in the development of this standard, had the following membership.

Chad M. Walber, *Chair*
Christopher J. Struck, *Vice-Chair*

David L. Josephson	Randall P. Wagner	Lixue Wu

Suggestions for improvements to 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, 1305 Walt Whitman Road, Suite 300, Melville, New York 11747. Telephone: + 1 (516) 576-2341; E-mail: standards@acousticalsociety.org.

American National Standard

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1 Scope

This part of IEC 61094 specifies mechanical dimensions and certain electroacoustic characteristics for condenser microphones used as laboratory standards for the realization of the unit of sound pressure and for sound pressure measurements of the highest attainable accuracy. The specifications are intended to ensure that primary calibration by the reciprocity method can be readily carried out.

This part also establishes a system for classifying laboratory standard condenser microphones into a number of types according to their dimensions and properties in order to facilitate the specification of calibration methods, the conducting of inter-laboratory comparisons involving the calibration of the same microphones in different laboratories, and the interchangeability of microphones in a given calibration system.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61094. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However parties to agreements based on this part of IEC 61094 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.

IEC 60050(801) *International Electrotechnical Vocabulary (IEV) – Chapter 801: Acoustics and electroacoustics*

ASME B1.1 *Unified inch screw threads (UN and UNR thread form)* [1]

3 Terms and definitions

For the purposes of this part of IEC 61094, the following definitions apply.

Remark – The underlined symbols are complex quantities.

[1] (American Society of Mechanical Engineers) Reference is given to ASME B1.1 in the absence of an equivalent international standard.