

ANSI S1.17-2004/Part 1
(Revision of ANSI S1.17-2000/Part 1)

AMERICAN NATIONAL STANDARD

**Microphone Windscreens – Part 1:
Measurements and Specification of
Insertion Loss in Still or Slightly Moving Air**

ANSI S1.17-2004/Part 1

Accredited Standards Committee S1, Acoustics

Standards Secretariat
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Secretariat

Acoustical Society of America

Approved 4 June 2004

American National Standards Institute, Inc.

Abstract

This standard specifies a test to use to determine the insertion loss of windscreens for measuring microphones over a defined frequency range. The insertion loss is determined in conditions that reflect performance in still or slightly moving air.

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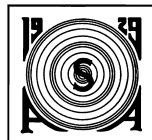
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Foreword

[This Foreword is for information only, and is not a part of the American National Standard ANSI S1.17 - 2004/Part 1 American National Standard Microphone Windscreens – Part 1: Measurements and Specification of Insertion Loss in Still or Slightly Moving Air].

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 is a revision of ANSI S1.17-2000/Part1, which has been technically revised to include the results of round robin testing done to determine the uncertainty of the determination of the insertion loss of a windscreen. The new material in this edition is given in clause 4. Normative references were also updated for this edition,

This standard is not comparable to any existing ISO Standard.

This standard includes 2 informative Annexes which are not considered part of this standard.

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

G.S.K. Wong, *Chair*

J.P. Seiler, *Vice-Chair*
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K.M. Eldred	A.H. Marsh	G.S.K. Wong
W.J. Galloway	P.D. Schomer	L. Wu

Working Group S1/WG 19, Windscreens, which assisted Accredited Standards Committee S1, Acoustics, in the development of this standard, had the following membership.

R.J. Peppin, Chair

A.J. Campanella	R. Raspet	K. Wilson
R.L. Clark	B. Tinianov	G.S.K. Wong
E. Frederiksen		

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

Introduction

Windscreens are used to reduce the direct effect of moving air on the microphone. As a goal, the measurement of the sound without a windscreen and without moving air would be close to the measurement of the same sound with a windscreen and with moving air, at any velocity. Practically, one would hope that the measurement of sound with a windscreen in moving air yields a more accurate measurement of the acoustic phenomenon than a measurement without a windscreen.

Often windscreens are used to protect the microphone from the environment, such as from dust or possible mechanical contact with hard objects. In these cases it is important to know the attenuation characteristics that affect the directivity.

Windscreens are often made of an open-cell foam material but may be of fabric or other material. The windscreens are commonly used for outdoor and indoor measurements in conditions with moving air.

A windscreen necessarily affects the sound impinging on the microphone. The quantification of that behavior is the purpose of this method. This method characterizes the performance of a windscreen by determining its insertion loss in still or slightly moving air. The users can then estimate the acoustical effect of the windscreen on the measurements they make. In the future these characteristics will be determined with moderate wind velocity including wind generated self-noise.

For testing purposes, a microphone is placed in a controlled environment (see clause 6). A sound is introduced and the one-third-octave-band sound pressure level is measured over the frequency range of interest. The test specimen, a suitably conditioned (maintained in the test environment for a specified and reported length of time) windscreen is attached to the microphone in accordance with manufacturer's instructions and the one-third-octave-band sound pressure level is again measured. The level difference is reported as the windscreen's insertion loss

American National Standard

Microphone Windscreens – Part 1: Measurements and Specification of Insertion Loss in Still or Slightly Moving Air

1 Scope

This standard, Part 1 of ANSI S1.17, specifies a test method that characterizes the acoustical performance of windscreens for measuring microphones in still or slightly moving air. The insertion loss is determined by measuring the sound pressure levels at a microphone with and without a windscreen in either a reverberant- (diffuse-) or free-field condition, or both. The insertion loss measured results from characteristics of the windscreen including material sound absorption and sound insulation properties, and from sound diffraction effects of the windscreen material. The test specifications are intended to insure that the measured acoustical characteristics of a windscreen are traceable to national standards.

While still or slightly moving air insertion loss does not characterize the performance of windscreens in moving air, it does provide a measure of the performance in the limit as moving air velocity approaches zero. Until further research is done, the relationship between the windscreen performance in still or slightly moving air and in significantly moving air is unknown.

Part 2 of this standard extends these measurements to moving air. Therefore, the effectiveness of the windscreen in reducing air movement turbulence will be addressed in Part 2.

The windscreen insertion loss measurement method is given in clause 9.

A goal of this standard is to, eventually: establish a system for classifying windscreens into a number of types according to their properties. This will facilitate the specification of overall accuracy for a device that uses windscreens.

This standard applies to axisymmetric microphone windscreens that can be used and usually interchanged on 1", 1/2", or 1/4" measuring microphones. These are referred to simply as "windscreens." Other windscreens that are covered by this standard include a) those that are part of an environmental microphone, i.e. a microphone system consisting usually of bird spikes, windscreen, microphone, holder, preamplifier, and, perhaps electrostatic actuator and desiccant. These are referred to as "windscreen components," and b) those that cover a dosimeter. These are often referred to as "dust covers." For the windscreen, the test is performed with any appropriate microphone and preamplifier system. For the windscreen component, the test is performed with the microphone system that is designed with the windscreen component in mind. For the dust covers, the test is performed with a measuring microphone of the same diameter.

This method excludes those screens used to measure noise in high-speed, controlled flow for, as example, in-duct measurements. These are sometimes called "nose cones."

Reporting requirements and identification markings for the windscreen are specified.